

## FIRST ADDENDUM TO DISCLOSURE STATEMENT

**WHEREAS** Tribute (Danforth) Limited (the “**Declarant**”) has prepared and delivered a Disclosure Statement made the 16<sup>th</sup> day of September, 2019, together with accompanying materials (collectively, the “**Disclosure Statement**”) with respect to the condominium project known as “Linx Condominiums” (the “**Project**”) in the City of Toronto;

**AND WHEREAS** on September 13, 2019 the Declarant received its Conditions of Registration for the licensing of the Declarant and the approval of the Project from Tarion Warranty Corporation (“**Tarion**”);

**AND WHEREAS** Tarion has subsequently advised the Declarant that as a result of the inclusion of the original structure at 292 Main Street being included within the Condominium, the Project contains “pre-existing elements” (as such term is defined in section 17.1 (1) of the ONHWPA) and therefore the Project is a “residential condominium conversion project” (as such term is defined in section 17.1 (1) of the ONHWPA);

**AND WHEREAS** as required by the ONHWPA, the Declarant has prepared the “pre-existing elements fund study” (as such term is defined in section 17.1 (1) of the ONHWPA) and has or will be entering into a pre-existing elements fund trust agreement with Tarion (in Tarion’s standard form).

1. The following changes have taken place with respect to the Disclosure Statement and accompanying materials:

### Disclosure Statement

- (i) The Disclosure Statement is hereby amended to insert new Article 27 attached hereto as Schedule “1”.
- (ii) Section 6.1 of the Disclosure Statement is hereby deleted and the following is inserted in replacement thereof: “The Building is subject to the ONHWPA, subject to the provisions of Section 27.4 of this Disclosure Statement.”
- (iii) The Disclosure Statement Table of Contents (under subsection 72 (4) of the Act) is hereby amended as follows:
  - (A) Paragraph 3 of the Table is hereby amended to add the following cross-reference to the third column: “Article 27, Section 27.4 on Schedule “1” attached to the First Addendum to Disclosure Statement”
  - (B) Paragraph 4 of the Table is hereby amended: (1) to now reference the fact that the use of the 292 House has been converted from a previous use; and (2) to add the following cross-reference to the third column: “Article 27, Section 27.1 on Schedule “1” attached to the First Addendum to Disclosure Statement.”

### Pre-existing Elements Fund Study and Budget matters

- (iv) A copy of the pre-existing elements fund study is attached hereto. Purchasers are advised that paragraph 6.4.2.1 of the pre-existing elements fund study recommends that \$24,000.00 should be budgeted for in the condominium reserve fund study for any expected major repairs to the pre-existing elements.
- (v) As the Declarant does not anticipate there being any major repairs to the pre-existing elements during the first (1<sup>st</sup>) year after registration of the Condominium there has been no amendment made by the Declarant to the Budget previously delivered with the Disclosure Statement.

### Pre-existing Elements Fund Standard Trust Agreement

- (vi) Purchasers are advised that the Declarant has or will be entering into Tarion’s standard form of Pre-existing Elements Fund Standard Trust Agreement whereby the Declarant has or will be posting \$24,000.00 with the Declarant’s solicitor, as trustee, to establish specific rules for the distribution of all or part of the \$24,000.00 to the Declarant or the Corporation in certain specific instances for any major repairs to the pre-existing elements.

### Declaration

- (vii) In accordance with section 2 (2.1) of the Act, the Declaration will be amended to contain confirmation that: (a) the project, the units or proposed units of the Project and the common elements of the Project will have been enrolled pursuant to the ONHWPA in accordance with the regulations made under ONHWPA; (b) the builder, within the meaning of the *New Home Construction Licensing Act, 2017* (Ontario) (“**NHCLA**”), is licensed as a builder in respect of the Project under the NHCLA; and (c) the vendor, within the meaning of the NHCLA, is licensed as a vendor in respect of the Project under the NHCLA.
2. Except as amended above, the Disclosure Statement and accompanying materials as previously provided to the Purchasers shall otherwise remain unaltered and the same shall continue to apply to the Project in the enclosed amended form. Defined terms herein shall have the same meanings given to them in the Disclosure Statement unless otherwise defined herein.

DATED at Toronto this 14<sup>th</sup> day of December, 2021.

**TRIBUTE (DANFORTH) LIMITED**

**SCHEDULE "1" TO THE FIRST ADDENDUM TO DISCLOSURE STATEMENT**

**ARTICLE 27**

**RESIDENTIAL CONDOMINIUM CONVERSION PROJECT**

**Section 27.1 – Intent to Create a Residential Condominium Conversion Project**

Pursuant to Section 72 (3)(f.1)(i) of the Act, the Project is a residential condominium conversion project.

**Section 27.2 – List of Pre-existing Elements**

The list of the pre-existing elements as identified in section 5.3 of the pre-existing elements fund study is as follows:

- (1) The original existing building component that will be retained will be the exterior walls' brick and decorative wood trim and soffits. However, infill brick at former window openings will be removed and existing wood fascia and soffits will be repaired or replaced with new wood fascia and soffits matching original profile. The existing decorative trim woodwork and existing metal work (along the top of the east elevation's bay) will be repaired.
- (2) Regarding alterations to the retained facades and structure, these will include replacement of window sills and fenestration with new stone sills and new fenestration (including doors); removal of the front (east) entrance addition; and the installation of a new asphalt shingle roof. The existing first and second floor structures will be replaced and new perimeter wood structural framing will be added (immediately inboard of the exterior perimeter walls). A new perimeter foundation wall, foundation slab and caissons will be built to replace the original foundation (that is abandoned and demolished).

**Section 27.3 – Pre-existing Elements Fund Study**

A copy of the pre-existing elements fund study is attached hereto.

**Section 27.4 – Non-applicability of ONHWPA to the Pre-existing Elements**

Purchasers are advised that subclause 13 (1)(a)(i) of the ONHWPA does not apply to the pre-existing elements.

**Section 27.5 – Copy of ONHWPA Text**

Pursuant to Section 72 (3)(f.1)(v) of the Act, the following is a copy of the text of subclause 13 (1) (a) (i) and subsection 17.2 (1) of the ONHWPA:

Subclause 13 (1)(a)(i):

- “13 (1) Every vendor of a home warrants to the owner,
- (a) that the home,
    - (i) is constructed in a workmanlike manner and is free from defects in material,”

Subsection 17.2 (1):

- “17.2 (1) This Act applies to a residential condominium conversion project and to a unit or a proposed unit in it only if,
- (a) the builder holds a licence as a builder under the New Home Construction Licensing Act, 2017 in respect of the project;
  - (b) the vendor holds a licence as a vendor under the New Home Construction Licensing Act, 2017 in respect of the project; and
  - (c) the project, the units or proposed units of it and the common elements of it have been enrolled in the Plan.”

**Section 27.6 – Registrar Satisfaction**

The Registrar, as defined in the ONHWPA, has confirmed that the conditions set out in subsection 17.2 (1) of the ONHWPA have been satisfied.



## Pre-Existing Elements Fund Study 292 Main Street - Toronto

*Client*

Tribute (Danforth) Limited

**Type of Document:**

Final Report

**Site Addresses:**

292 Main Street, Toronto, ON

**Project Number:**

BRM-21000944-A0

**Prepared and Reviewed By:**

EXP

1595 Clark Boulevard  
Brampton, ON L6T 4V1  
t: +1.905.793.9800  
f: +1.905.795.0641

**Date Submitted:**

2021-12-07

## **Warranties and The Pre-Existing Elements Fund**

### **WARRANTIES**

As of January 1, 2018, the Ontario New Home Warranties Plan Act extends statutory warranties to residential condominium conversion projects (RCCPs). All warranties apply to RCCPs, except for the first-year warranty pertaining to workmanship and materials of pre-existing elements.

### **PRE-EXISTING ELEMENTS FUND**

The vendor is required to contribute an amount to the Pre-existing Elements Fund equal to the value of the “expected major repairs” estimated in the expected major repair schedule within the initial period. The initial period is seven years following the future date of registration of the Condominium Corporation. The total amount estimated with the initial seven years following the future date of registration of the Condominium Corporation. The total amount estimated within the initial seven year period is to be set aside in a trust account by the vendor for the future Condominium Corporation to pay for those estimated major repairs or replacements of the pre-existing elements only.

For this development:

- The future date of registration is estimated to be the end of 2023. Therefore the initial 7 year period is 2023 to 2029 inclusive.
- The total estimated expenditure within the initial seven year period is \$24,000.
- The estimated expenditures for the pre-existing elements are listed in the capital plan summary tables in this report.

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Appendix F: Designated Substance Survey (by Terraprobe Inc.)

## 1. Introduction

EXP Services Inc. (EXP) was retained by Tribute (Danforth) Limited to carry out an assessment and develop a capital replacement plan of the original building components of the building at 292 Main Street, Toronto that will be retained and incorporated into the new building development. The LINX Condominium project consists of a residential tower. The condominium tower will be located within the former footprint of 276, 286, 290, 292 and 296 Main Street, of which 292 Main Street will be retained and relocated directly adjacent to the neighboring property at 2547 Danforth Avenue. 292 Main Street will be converted into the management office for the new condominium tower and will be modified by installing new openings on the south elevation.

The condominium tower will be registered as one condominium corporation. This report is for the retained building components of 292 Main Street that was relocated and will be incorporated into the new tower.

## 2. Scope of Work and Methodology

The purpose of the assignment is to provide a report with a general description of the property and condition of the retained building components; a general description of the planned conversion, including repairs and modifications that will be made to pre-existing building elements that are to be incorporated into the new development; present findings of testing undertaken; and develop a capital plan of repairs/replacements that may be required to the aforementioned pre-existing building elements.

In general terms, the intent of the review was to identify and comment on the condition of existing building components that will be incorporated in the new residential condominium. Existing conditions that were not recorded were not apparent given the level of study undertaken. Only conditions seen during a visual review of representative samples (and areas) have been assessed and comments on the remaining conditions are assumptions based on extrapolation. Deficiencies and conditions were noted from a visual review of the building components that are to be retained (i.e., the pre-existing building components); the results of testing (where deemed appropriate); and review of other applicable studies and reports. These variables were analyzed to develop a plan of capital expenditures that will likely be required to repair or replace these pre-existing building components over the next 7 years and 45 years after the condominium has been registered. Capital expenditures are defined as those costs not associated with future routine maintenance.

The scope of this review is not intended to be an exhaustive review of conditions (whether these were visible or concealed) with respect to building code, property standards by-laws or other legislative requirements that existed at the time of the original building's construction, or that may retroactively apply. EXP expects that such non-compliances and deficiencies in the original building's retained components, if existent, will be identified by the project's design and code consultant team as part of the registered condominium conversion project.

The capital plan provides a qualified opinion of the anticipated capital repairs or replacements for the building's pre-existing materials and components that may be required over the next 45 years, including opinions of probable costs for repairs or replacements that may exceed \$2,000 in value. The opinions of probable cost in this report are EXP's estimates of a probable current dollar value of the work and are for order-of-magnitude budget purposes only. EXP has no control over the cost or availability of labour, equipment, materials, over market conditions or the contractor's methods of pricing. EXP's opinion of probable costs are made based on EXP's judgement and experience. Notwithstanding the latter, EXP makes no warranty, express or implied, that the cost of the work will not vary from EXP's stated opinion of probable costs. The actual cost of

the work presented in this report can only be definitively established once the work is completed and final repair quantities are known. Certain increased costs and changes may be required, and thus the final cost of the work may exceed the opinion of probable cost presented herein. Moreover, the timing given in this report to undertake the work are EXP's opinion of when it may be necessary to budget for the work. The optimal repair or replacement timing of the subject elements or failure of the subject elements could also vary from EXP's qualified opinion.

It should be noted that the opinions given in this report are those of the consultant team. These opinions were not influenced in form or content by pressure from the applicant or anyone representing the applicant. The consultant team acknowledges that their fiduciary duty in preparing the report is to Tarion, and ultimately to provide consumer protection to the purchasers of homes in the condominium project.

A copy of EXP's Certificate of Authorization is included in Appendix A of this report.

In carrying out this assignment, the following methodology was employed:

- EXP reviewed available relevant documents, such as original drawings, regarding the 292 Main Street building structure and building envelope that are relevant to the building façade being retained and drawings of the new proposed residential building. Documents for review also included the relevant structural evaluation from the project structural engineers, Read Jones Christoffersen Ltd.; the designated substance survey (DSS) report; the Heritage Impact Assessment report; and the Conservation Plan report.
- EXP performed a visual review of the condition of the existing building façade and building structure that is to be incorporated into the new condominium project. The walls were reviewed at localized sections of the east and west perimeter exterior walls observable at exploratory openings made (by others) in the exterior wall's exterior and interior wall finishes. The roof structure was reviewed from the attic space which was accessed through an opening cut into the ceiling. Site review was performed by Chris Glazier, P.Eng. and Marissa Ford, B.A.Sc, of EXP on February 26, 2021.
- EXP confirmed the make-up of the existing exterior wall assembly at two test openings at the façade that is to be retained and incorporated within the new building development (openings were performed by a Contractor retained by EXP). Test openings were performed at grade level, and brick samples were removed and retained from each test opening location, for testing at EXP's Brampton laboratory.
- Testing of the brick samples was conducted. Bricks were tested for compressive strength, saturation coefficient, and absorption coefficient, in accordance with ASTM C67 and ASTM C1794; and as well as for freeze-thaw resistance in accordance with CAN/CSA A82. All testing was performed under the direction of Mark Kennedy, C.E.T. of EXP.
- The information gleaned from the site review, material testing results and the design drawings were employed to carry out a hygrothermal analysis for the building envelope. This analysis was carried out using a recognized computer simulation (Fraunhofer IBP's WUFI 6.3 PRO) to aid in predicting the risk associated with insulating the masonry wall from the interior. This analysis was to identify the risk and degree to which insulating is feasible without resulting in damage to the retained masonry facade.

### 3. General Description of the Property

The existing building at 292 Main Street is a nineteenth-century detached house constructed in 1887.

The building is composed of two-stories above grade and a single level basement. The building façade is clad in brick with sections of punched windows. The gable roof is clad with asphalt shingles. The building perimeter walls are constructed of double wythe brick and conventional wood framing with brick cladding. The roof consists of asphalt shingles and wood plank sheathing on wood rafter framing. The building's former foundation consisted of continuous stone walls along the building perimeter (beneath the exterior walls). At the time of EXP's review, the building had already been moved to its new location; however, it was being supported on the temporary steel structural frame above the new foundation.

The heritage architects, ERA Architects Inc. (ERA Architects), have indicated that the property is "valued for its association with one of East Toronto's most significant residents, Donald George Stephenson, who was a local lumber merchant, landowner and politician, having acted as the Village of East Toronto's first Reeve (1888-1894)". They have also indicated that this building possesses historical and contextual value and is recognized as a unique example of the brick dwellings in the Main Street and Stephenson Avenue area attributed to D.G. Stephenson.

At the time of the original zoning by-law amendment application for the properties at 286-294 Main Street on June 30, 2021, a heritage impact assessment was not required as part of the development application submission. However, due to the City Council not rendering a decision within the timeframe prescribed in the Planning Act, the application was appealed and, as a result, a settlement proposal was drafted and adopted by City Council which included the retention and relocated of 292 Main Street within the development site. As part of the approved settlement, the existing building at 292 Main Street is to be relocated to the northern edge of the development site adjacent to a potential heritage property at 2547 Danforth Avenue.

## 4. General Description of the Planned Conversion

The new mixed-use development is comprised of a 27-storey tower with podium levels on the 5<sup>th</sup> and 12<sup>th</sup> floors. The heritage building at 292 Main Street will be relocated to the northeast corner of the new development where it will become partially enclosed by and connected to the new condominium's lobby via two openings along the heritage building's south elevation. The heritage building will be converted to commercial space and utilized as the property management office for the new condominium complex. The heritage building's façade will be retained. The proposed conservation strategy for the exterior façade of the heritage building is rehabilitation. The existing interior building materials will not be conserved and will be removed and replaced as part of the building conversion. The existing roof framing and second floor framing will remain in-place and will be repaired and supplemented, whereas the first floor will be removed and replaced by new floor structure as part of the conversion. In summary, the facade conservation approach includes:

### *East Elevation*

- 100% cleaning and repointing of masonry and selective brick replacement;
- Tuckpointing (brickwash and ribbon);
- Full replacement of window units with new wood to match original design;
- Replacement of existing window sill with new stone sills.
- Removal of front entrance addition;
- New asphalt shingle roof;
- Repair existing woodwork (gables and soffits/decorative trim);
- Repair existing metal work (cresting on bay, new downspouts, new flashing); and
- Replacement of main door.

### *West Elevation*

- 100% cleaning and repointing of masonry and selective brick replacement;
- Removal of existing windows and infill with recessed brick to match layout of window openings;
- Replacement of existing window sill with new stone sills.
- Removal of existing basement entrance;
- Repair existing woodwork (gables and soffits); and
- Replace existing metal work (new downspouts, new flashing).

### *North Elevation*

- 100% cleaning and repointing of masonry and selective brick replacement;
- Removal of existing vinyl windows and infill with recessed brick to match layout of existing openings;
- Replacement of existing window sill with new stone sills.
- Repair existing woodwork (soffits); and
- Replace existing metal work (new flashing).

### *South Elevation*

- 100% cleaning and repointing of masonry and selective brick replacement;
- Repair existing woodwork (soffits);
- Repair existing metal work (new flashing, repair louvre);
- Remove infill materials from lancet and easternmost window openings and replace with new wood units to match original design; and
- Replacement of existing window sill with new stone sills.

## 5. Description of the Pre-Existing Elements

### 5.1 Building Structure

The existing structure was generally concealed. However, based on the heritage drawings produced by ERA Architects, dated December 9, 2020, the building's structure reportedly consists of double wythe brick on the north, south and east walls of the building. The drawings also indicate that the east wall interior finish consists of wood stud, wood lathe and plaster. This differs from EXP's findings at the two exploratory openings, since wood stud framing was not observed at the east elevation opening. The west wall consisted of a single wythe of brick with wood stud framing, wood lathe and plaster. The roof A-framing consisted of 1-7/8" x 6" wood rafters and 3-3/4" x 1-7/8" ceiling joists, both spaced at 16" on center. The roof sheathing consisted of 5/8" thick planks of varying widths. Moisture was observed in the roof rafters and decking. Select roof decking appeared to have been replaced. The existing rubble foundation was demolished at the time of EXP's review.

### 5.2 Building Envelope

In general, the cladding (at non fenestration openings) consists of solid masonry with no drainage provisions, i.e., it is a face sealed system (weatherproofing is provided by the exterior 'face', which means there is no secondary "back-up" barrier to divert water that has bypassed the face to the exterior)(refer to Appendix B). The exterior walls are not insulated. The two exploratory openings (made from the exterior), performed in the east and west perimeter walls, generally confirmed that the east perimeter exterior wall at the bay window consists of two wythes of brick with a collar joint of approximately 1/2" width and the west perimeter exterior wall consists of a single wythe of brick and a wood framed stud wall. A minimal gap of varying width was observed between the stud framing and the brick cladding.

Exploratory openings (made from the interior) confirmed that the interior wall finish at the building's east perimeter consists of a 3/8" plaster layer with wood lathe, mounted to the inside face of the double wythe brick and the interior wall finish at the west perimeter consists of a 3/8" plaster layer with wood lathe mounted to the interior face of the stud framing. A secondary layer of 3/8" plaster with wood lathe is also located between the stud framing and is mounted to the interior face of the 2"x2" framing located on either side of the stud framing near its exterior face.

### 5.3 Description of Retained Pre-Existing Elements

The original existing building component that will be retained will be the exterior walls' brick and decorative wood trim and soffits (refer to Appendix C for perimeter of retained pre-existing façade and structure). However, infill brick at former window openings will be removed and existing wood fascia and soffits will be repaired or replaced (as noted on elevation drawings) with new wood fascia and soffits matching original profile. The existing decorative trim woodwork and existing metal work (along the top of the east elevation's bay) will be repaired.

Regarding alterations to the retained facades and structure, these will include replacement of window sills and fenestration with new stone sills and new fenestration (including doors); removal of the front (east) entrance addition; and the installation of a new asphalt shingle roof. The existing first and second floor structures will be replaced and new perimeter wood structural framing will be added (immediately inboard of the exterior perimeter walls). A new perimeter foundation wall, foundation slab and caissons will be built to replace the original foundation (that is abandoned and demolished).

## 6. Pre-Existing Elements Repairs and Alterations

### 6.1 Building Structure

The new development's project design structural engineer, Read Jones Christoffersen Ltd., have provided a structural stability letter (refer to Appendix D for a copy of their letter dated October 14, 2021). RJC lists the structural modifications and their sequence that will be performed and employed to "adequately support the existing structure." This letter also comments on the intended design of the new foundation.

At the time of EXP's review, the building had already been moved to its new location; however, was still supported on the temporary steel structural frame above the new foundation. The new foundation will consist of a perimeter reinforced concrete and block wall, supported by a 500mm thick reinforced concrete transfer slab on perimeter caissons.

The existing roof sheathing and rafter framing will remain in-place and repaired/replaced as required, as noted in the Conservation Plan and in the new development's structural design drawings. The existing ground floor slab will be replaced in its entirety, immediately inboard of all retained exterior walls. The new floor will consist of 2x10 wood joist framing supporting ¾" plywood sheathing with a 2" thick concrete topping. Second floor framing is to remain in-place and be supplemented with new wood joists, tied-into perimeter wood stud framing, immediately inboard of the existing perimeter exterior walls.

### 6.2 Building Envelope

The existing roofing will be replaced in its entirety with new asphalt shingles, prefinished metal eavestroughs, downspouts and flashing. The roof deck will be reviewed once exposed and areas of damaged or deteriorated decking will be replaced as required. A new roof structure will be installed on the south elevation of the heritage house to act as a transition to the new condominium tower.

The existing masonry chimney will be conserved and repaired; however, it will be permanently capped since it will no longer be operational. The retained façades will be restored. The intent is to keep the existing brick façade on all elevations and replace damaged brick with salvaged brick (from façade sections that are to be demolished). Based on the Conservation Plan by ERA, EXP understands that the following repairs will be undertaken to restore the pre-existing retained façades (Appendix E):

- All areas of masonry will be cleaned from soiling, graffiti, discolouration, and algae;
- All exterior masonry, including the chimney will be repointed, and east and south elevation masonry tuck pointed;
- All elevations will have a brick wash;
- Existing decorative trim woodwork and existing metal work (at the east elevation's bay) will be repaired
- Replacement of damaged brick with salvaged brick or new to match existing.

The new development's project design drawings indicate that the following replacements, additions or modifications will be made to the retained façades:

- The existing windows and doors will be replaced with new wood doors and wood framed windows. The window sills will also be replaced with new stone sills.
- The infill brick on the north and south perimeter walls will be removed to allow for new or enlarged window and door openings.
- The basement windows on the west and north perimeter walls will be infilled with salvaged bricks.
- The existing wood fascia and soffits will be replaced with new wood fascia and soffits matching original profile.

## 7. Pre-Existing Elements Repair Fund Plan

The pre-existing elements capital repair plan provides an opinion of the anticipated capital repairs or replacements for the building's pre-existing components that will be retained and incorporated into the new building. The repairs or replacements and the opinions of probable costs presented in the capital plan are those that may be required over the 45 years after condominium registration. The capital expenditures presented herein are those that exceed \$2,000 annually (for a given repair or replacement) and are not those that are included in a repetitive (i.e. routine) maintenance program. The opinion of probable costs forecast includes an opinion of all construction costs; i.e., mobilization, demobilization, allowance for the building permit, bonding, access, and all other construction costs related to the project, as well as a construction contingency, an allowance for engineering and contract administration, and applicable tax.

The timing of repairs, whether its first occurrence or its cycle, indicated in the capital plan, is EXP's opinion of when to budget for the repairs, based upon: the pre-existing element having been restored in accordance with the remediation plan proposed in the Conservation Plan (and described in this report); industry noted service lives; and EXP's experience with the timing and scope of those components' repairs. Specifically, life expectancies of the building components in this report are based on EXP's observations of the performance of such (or similar) components at other buildings, available reports/documents and manufacturer recommendations, where available and pertinent. However; the optimal repair or replacement timing of the subject elements or failure of the subject elements could vary from EXP's opinion. The following tables 7a and 7b are summaries of the initial (first seven years) and the full 45 years major repair capital plan summary for the retained heritage building elements at 292 Main Street.

**Table 7a - The Initial 7-Year Major Repair Capital Plan Summary (Uninflated)**

	Item	Expected Major Repair Schedule and Budget									
		Present Cost	Year of 1 <sup>st</sup> Occurrence	Cycle (years)	2023	2024	2025	2026	2027	2028	2029
1	<b>Building Structure</b>										
1.1	Local Structural Review and Repair	\$26,000	2043	20	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2.	<b>Building Envelope</b>										
2.1	Condition Assessment and Local Repairs	\$24,000	2028	5	\$0	\$0	\$0	\$0	\$24,000	\$0	\$0
2.2	Target Façade Repairs	\$40,000	2040	36	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2.3	General Façade Repairs	\$57,000	2057	35	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2.4	Sealant Repairs	\$8,000	2040	18	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Anticipated Uninflated Expenditure:					\$0	\$0	\$0	\$0	\$24,000	\$0	\$0

**Table 7b – The 45-Year Major Repair Capital Plan Summary (Uninflated)**

	Item	Expected Major Repair Schedule and Budget									
		Present Cost	Year of 1 <sup>st</sup> Occurrence	Cycle (years)	2023 to 2029	2030 to 2036	2037 to 2043	2044 to 2050	2051 to 2057	2058 to 2064	2065 to 2071
1	<b>Building Structure</b>										
1.1	Local Structural Review and Repair	\$26,000	2043	20	\$0	\$0	\$26,000	\$0	\$0	\$26,000	\$0
2.	<b>Building Envelope</b>										
2.1	Condition Assessment and Local Repairs	\$24,000	2028	5	\$24,000	\$24,000	\$48,000	\$24,000	\$48,000	\$24,000	\$24,000
2.2	Target Façade Repairs	\$40,000	2040	36	\$0	\$0	\$40,000	\$0	\$0	\$0	\$0
2.3	General Façade Repairs	\$57,000	2057	35	\$0	\$0	\$0	\$0	\$57,000	\$0	\$0
2.4	Sealant Repairs	\$8,000	2040	18	\$0	\$0	\$8,000	\$0	\$0	\$8,000	\$0
Total Anticipated Uninflated Expenditure:					\$24,000	\$24,000	\$122,000	\$24,000	\$105,000	\$58,000	\$24,000

## 7.1 Building Structure

The following repairs and repair programs are forecast for the retained building structure components of the original building:

### 7.1.1 Local Structural Review and Repair

This work is the target review of existing retained roof framing and sheathing. It is a more intrusive review than the regular, periodic exterior roof visual reviews that should be conducted by a qualified professional. It is assumed that as part of the due diligence, the new development's project design, construction and contract administration team will review and repair the existing structure as required, as part of the residential condominium conversion project. Therefore, going forward, EXP recommends performing this intrusive (i.e. exploratory openings) review no more than at 20-year intervals subsequent to condominium registration. However, it would be prudent and practical to include this review and time it to occur in conjunction with roof repairs and replacement whenever either are performed at/close to the 20 year recommended intervals (the first recommended intrusive review, at year 20, will probably not coincide with roofing replacement). This work includes the local removal of roofing and sheathing to expose the structural framing (rafters) at a minimum of three locations (randomly selected, unless the location(s) are designated to be investigated due to suspect exterior indicators, i.e., visual deformations, leak locations, etc.)

**Table 7.1 – Local Structural Review and Repair Opinion of Probable Cost Summary**

Present Cost	First Occurrence	Cycle (years)	Number of Occurrences (over 45 years)
\$26,000	Year 2043	20	2

## 7.2 Building Envelope

The following repairs and repair programs are forecast for the retained building envelope components of the original building:

### 7.2.1 Condition Assessment and Local Repairs

A visual condition assessment, conducted by a qualified professional (such as a professional engineer or an architect, experienced in building envelope assessment), is recommended at regular intervals (such as every 5 years). This would include a visual survey and assessment of the exterior walls at all building façades. Included is an allowance to conduct some localized façade repairs, such as deteriorated brick and mortar joint replacement/repointing and local sealant replacement. Although fenestration could be included in this façade visual review, the budgeting of any repairs that may be required or recommended should be budgeted for in the condominium reserve fund study given that fenestration is not an original (pre-existing) retained building component.

**Table 7.2 – Condition Assessment and Local Repairs Opinion of Probable Cost Summary**

Present Cost	First Occurrence	Cycle (years)	Number of Occurrences (over 45 years)
\$24,000	2028	5	9

### 7.2.2 Target Façade Repairs

This repair program would be mostly reactive, to **locally** address areas of deteriorated masonry. Repairs would primarily consist of deteriorated mortar joint repointing and damaged brick replacement. Deteriorated mortar joints included in this repair program would be mortar joints that are cracked, debonded or spalled. These joints would be raked out and repointed and loose, spalled, cracked or otherwise deteriorated brick would be removed and replaced. Repointing of weathered mortar joints would not be included in this repair (they would be part of the general façade repair program).

**Table 7.3 – Target Façade Repairs Opinion of Probable Cost Summary**

Present Cost	First Occurrence	Cycle (years)	Number of Occurrences (over 45 years)
\$40,000	2040	36	1

### 7.2.3 General Façade Repairs

This repair strategy is a more comprehensive and proactive repair program (than the target façade repair program) that includes all of the anticipated target façade repairs described above, as well as addressing weathered mortar joints. Specifically, general façade repairs would include deteriorated mortar joint repointing and damaged brick replacement. Deteriorated mortar joints are joints that are cracked, debonded, spalled and weathered.

**Table 7.4 – General Façade Repairs Opinion of Probable Cost Summary**

Present Cost	First Occurrence	Cycle (years)	Number of Occurrences (over 45 years)
\$57,000	2057	35	1

### 7.2.4 Façade Sealant Replacement

Façade sealant replacement includes the replacement sealants around the chimney and metal louvre on the south elevation. This would include cutting out and removing all existing sealant, cleaning the substrate and installing a new a backer rod and sealant. Other façade sealants, within the fenestration and at fenestration perimeters and sills, is not included within this repair program since those sealants are part of the new fenestration (i.e., not an original retained building component).

**Table 7.5 – Façade Sealant Replacement Opinion of Probable Cost Summary**

Present Cost	First Occurrence	Cycle (years)	Number of Occurrences (over 45 years)
\$8,000	2040	18	2

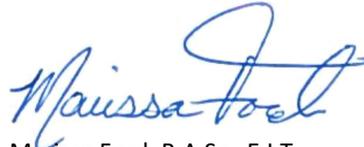
## 8 Closure

EXP trusts the information provided in this report is sufficient for your purposes. Should you require any further information please do not hesitate to contact one of the undersigned.

Sincerely,  
EXP Services Inc.



Chris Glazier, P.Eng., LEED Green Associate  
Head of Building Science  
Hamilton Office



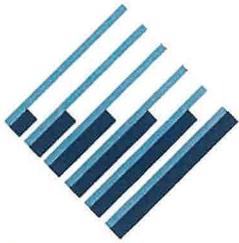
Marissa Ford, B.A.Sc., E.I.T.  
E.I.T., Façade Engineering Group  
Building Science



Ricardo Gama, M.Eng., P.Eng.  
Senior Project Manager, Façade Engineering Group  
Building Science

*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-2100944-A0  
December 7, 2021*

## Appendix A: Certificate of Authorization



# Professional Engineers Ontario

## Certificate of Authorization

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General

---

EXP Services Inc.

is hereby granted the authorization to engage in the business of  
providing services that are within the practice of

**Professional Engineering**

in the Province of Ontario in accordance with the provisions of  
the Professional Engineers Act.

---

Given under the Corporate Seal of the Association at the  
City of Toronto this:

11<sup>th</sup> day of April, 2011 - #100170959

*Diane L. Freeman, P.Eng., FEC*  
President

*[Signature]* P. ENG  
Registrar

---

Association of Professional Engineers of Ontario. This certificate is the property of the  
Association and must be surrendered on revocation, cancellation, suspension or expiry.



*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-21000944-A0  
December 7, 2021*

## **Appendix B: Existing (Pre-Rehabilitation) Building Façade Photos**

*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-02100944-A0  
October 15, 2021*



East Elevation Photograph

*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-02100944-A0  
October 15, 2021*



North Elevation Photograph

*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-02100944-A0  
October 15, 2021*



South Elevation Photograph

*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-02100944-A0  
October 15, 2021*



West Elevation Photograph

*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-2100944-A0  
December 7, 2021*

## Appendix C: Architectural and Structural Drawings





















*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-2100944-A0  
December 7, 2021*

## **Appendix D: Letter of Structural Adequacy (by Read Jones Christoffersen Ltd.)**

October 14, 2021

Tribute Communities  
1815 Ironstone Manor, Unit 1  
Pickering, ON  
L1W 3W9

Attention: Mark Iogna  
Project Manager, Land Development

**Re: Heritage House Permanent structural stability**

To whom it may concern,

We have reviewed the location of the Heritage structure for this development and have arranged for schematic structural framing to adequately support the existing structure and build a new ground floor structure and retrofit the 2<sup>nd</sup> floor. The structural framing will consist of new engineered wood elements (LVL and Paralam columns) as well as typical sawn lumber that will follow the pitched roof profile in the current house with. The lateral stability of the house is provided by the existing masonry façade and under Part 9 of the OBC 2012 is an inherent property of part 9 structures. For the house foundation we will be specifying a concrete raft supported on caissons that will extend to match the condo bottom of footing elevation and avoid any unwanted surcharge on the parking structure. The raft will be constructed around 1.5-2 m below the existing grade for construction purposes in order to allow for the house relocation consultant to slide the carrying beams. After the beams are removed and the house supported on a set of piers, we will then build a new crawl space in this area with a perimeter frost wall to support the Heritage house. We are proposing the following construction sequence:

1. Install the new shoring piles around the location of the new heritage house.
2. Excavate the new location of the Heritage house to the bottom of the Raft.
3. Install the additional caissons to support the raft and form and pour the raft.
4. Pour the concrete piers to support the house.
5. Relocate the heritage property and set them in the new piers.
6. Build the concrete frost wall to enclose the crawl space.
7. Reinforce the existing 2<sup>nd</sup> Floor and roof by retrofitting the existing elements with new wood members.
8. Remove and build the updated ground floor.
9. Proceed with finishes.

The above construction sequence has been carefully planned and coordinated with all disciplines and construction crew in order to optimize the relocation and adequately support and repurpose this historic structure. If further information is required, please do not hesitate in contacting us.



Yours truly,  
Read Jones Christoffersen Ltd.  
Jose Polanco, PE, SE, Peng.  
Associate

*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-2100944-A0  
December 7, 2021*

## **Appendix E: Drawing of Retained Façades (from Conservation Plan)**

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2	2020-11-25	REVISED CONSERVATION PLAN
3	2020-12-08	REVISED CONSERVATION PLAN
4	2020-12-09	REVISED CONSERVATION PLAN

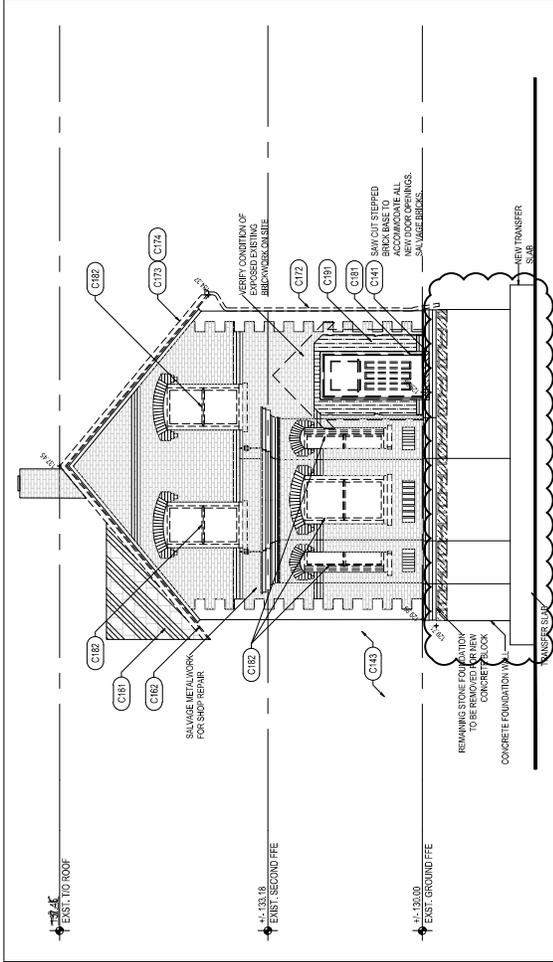
**LEGEND**



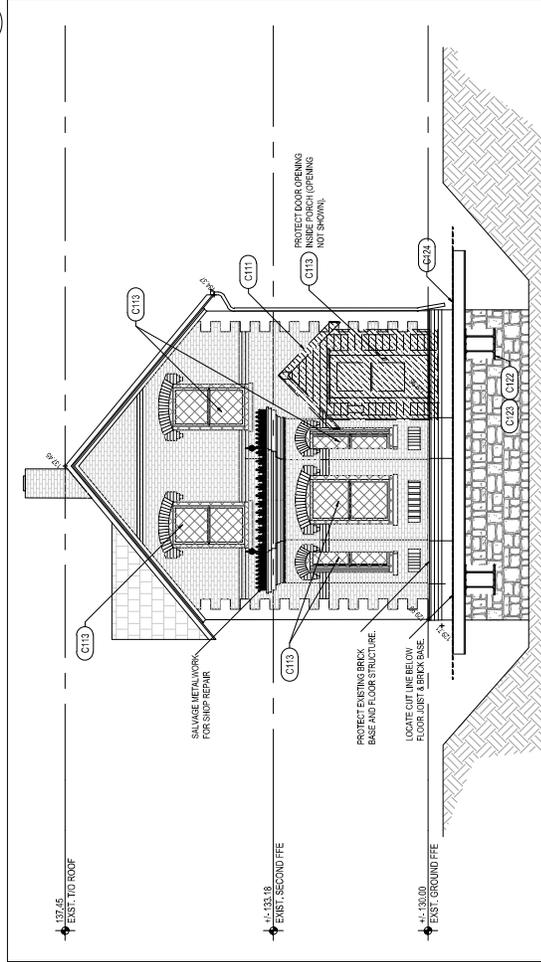
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Address	292 Main Street Toronto, ON
For	Conservation Plan
Project no.	17-095-05
Scale at 11x17	1 : 100
Drawn by	ERA
Reviewed by	DL
Drawing title	Demo East Elevations

Sheet no. H130

H130



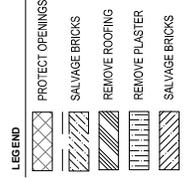
Demo East Elevation (Post-Relocation)  
 Scale 1:100  
 2 H130



Demo East Elevation (Pre-Relocation)  
 Scale 1:100  
 1 H130

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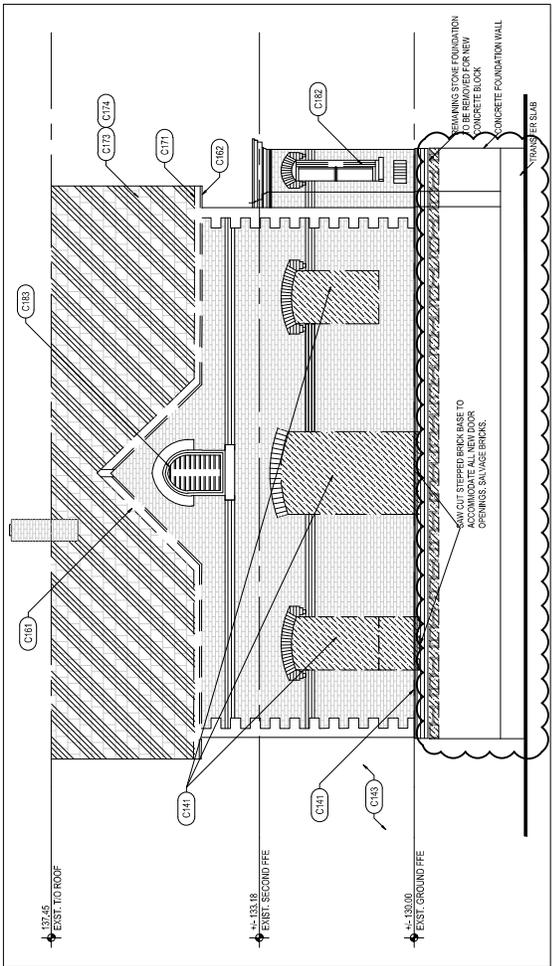
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4	2020-12-09	REVISED CONSERVATION PLAN



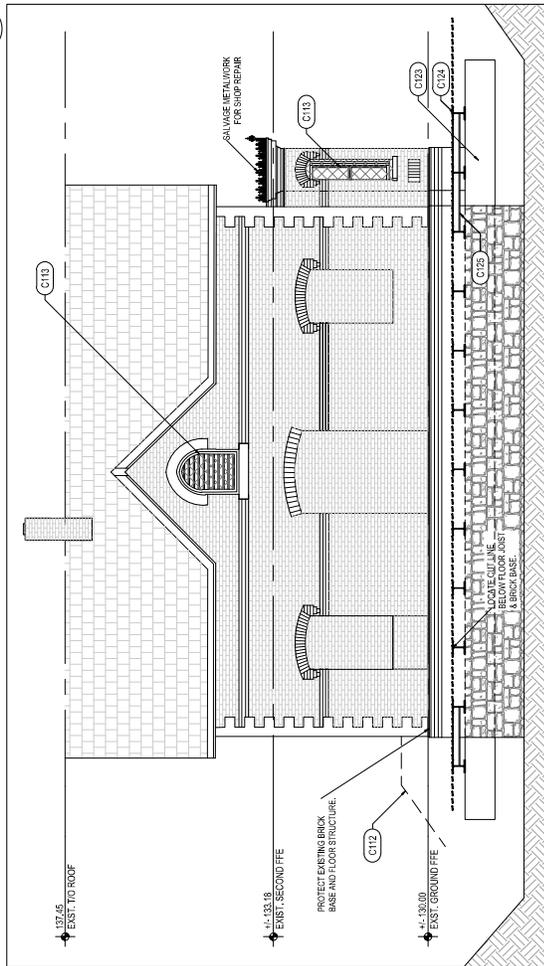
**E R A**  
 E.R.A. Architects Inc.  
 480 Church Street, Suite 600  
 Toronto, ON, Canada M5T 1P5  
 Tel: 416.593.8477 | Fax: 416.593.8399

Project: 292 Main Street  
 Address: 292 Main Street Toronto, ON  
 For: Conservation Plan  
 Project no.: 17-095-05  
 Scale at 11x17: 1:100  
 Drawn by: ERA  
 Reviewed by: DL  
 Drawing title: Demolition South Elevations

Sheet no.: H131



Demo South Elevation (Post-Relocation)  
 Scale 1:100  
 2 H131



Demo South Elevation (Pre-Relocation)  
 Scale 1:100  
 1 H131

- C127 RAISE BUILDING TO ACCOMMODATE DOLLIES UNDER EACH BEAM AT THE SAME LEVEL AS THE TOP OF THE TRANSFER SLAB.
- C128 PLACE SECONDARY NEEDLES BETWEEN THE CROSS BEAMS, AND PACK TIGHT.
- RELOCATION
- C130 - MOVE BUILDING & SECURE TO FINAL LOCATION
- C131 PREPARE PATH OF RELOCATION, LAY TIMBER ROAD IN THE BASEMENT.
- C132 PLACE OSCILLATING HYDRAULIC STEERING DOLLIES UNDER THE BUILDING. INSTALL DOLLIES ONE AT A TIME, REPLACING THE CRIB PILES. SHUT DOLLIES INTO ZONES AND CONNECT HYDRAULICALLY.
- C133 WINKER THE BUILDING AWAY FROM THE FOUNDATION AND OVER TO THE NEW TRANSFER SLAB.
- C134 REMOVE DOLLIES. PUT CRIBBING PILES IN PLACE.
- C135 JACK BUILDING DOWN AND LEVEL TO ITS PERMANENT POSITION.
- C136 REMOVE SECONDARY NEEDLES.
- C137 BUILD NEW FOUNDATION BETWEEN THE CROSS BEAMS. FOR NEW FOUNDATION DETAILS, SEE ARCHITECTURAL.
- C138 PIN FOUNDATION TO THE UNDERSIDE OF THE BRICK, ONCE THE BUILDING IS FULLY PINNED AND SUPPORTED, THE FRAMEWORK WILL THEN BE RELEVED.
- C139 REMOVE RELOCATION STRUCTURE, AND REFILL REMAINING OPENINGS.
- POST-RELOCATION
- C140-C149 - PREPARE BUILDING FOR CONSERVATION.
- C141 CAREFULLY DISMANTLE & SALVAGE GOOD QUALITY ORIGINAL BRICKS, WHERE DEMOLITION IS REQUIRED. BRICK REMOVAL REQUIRED FOR NEW OPENINGS, SALVAGE SUFFICIENT QUANTITIES TO COMPLETE CONSERVATION WORK.
- C142 MASONRY OPENINGS TO BE INFILLED WITH SALVAGED BRICKS, MATCH EXISTING AND ADJACENT BRICK AREAS.
- C143 REMOVE RELOCATION STRUCTURE.
- C144 REMOVE ALL REDUNDANT EXTERIOR ATTACHMENTS ON ALL ELEVATIONS, INCLUDING SIGNAGE, MISCELLANEOUS FASTENERS, EQUIPMENT, SIGNAGE, AND CLADDING.
- C145 CLEAR THE INTERIORS, REMOVE RUBBLE, FURNITURE, AND OTHER ELEMENTS. CLEAR THE BASEMENT FROM ANY OBSTRUCTIONS DISALLOWING THE INSTALLATION OF RELOCATION STRUCTURE.
- C146 INSPECT SOUNDNESS OF REMAINING STRUCTURE
- C147 PROVIDE ADDITIONAL BRACING AS REQUIRED FOR BRACINGWORK, REFER TO STRUCTURAL.
- C148 COORDINATE WITH OWNER'S OWN FORCES ON THE REMOVAL OF 4' HIGH PROTECTION BOARD AT BASE OF BUILDING.
- C149 - INSTALL TEMPORARY STRUCTURE.
- C150 CLEAR & EXCAVATE BUILDING PERIMETER TO THE WIDTH AND DEPTH REQUIRED TO INSTALL RELOCATION STRUCTURE.
- C151 LOCATE CUT LINE AT FOUNDATION WALL, CAREFULLY DEMOLISH FOUNDATION WALL TO ACCOMMODATE RELOCATION STRUCTURE.
- C152 INSTALL THE MAIN BEAMS OF THE RELOCATION STRUCTURE. LEVEL AT DESIRED HEIGHT. REST MAIN BEAMS ON TIMBER CHIEF PILES THAT EXTEND TO THE BASEMENT FLOOR.
- C153 INSERT CROSS BEAMS THROUGH THE FOUNDATION WALLS AND WINDOW OPENINGS. PACK THE CROSS BEAM ENDS WITH BRICK HERITAGE WALL AND INTERIOR MASONRY WALLS.
- C154 PLACE NEEDLE BEAMS AT THE END OF THE FOUNDATION WALLS. INSERT NEEDLE BEAMS, PACK TO BRACK LINE. MAKE SURE NEEDLE BEAMS AND PACK AT A TIME. PACK FIRST FLOOR JOIST TO THE CROSS BEAMS. INSTALL ANY NECESSARY BRACING FOR WEAK POINTS.
- C155 PLACE HYDRAULIC JACKS IN THE CRIBBING PILES AND ATTACH TO A UNIFIED JACKING SYSTEM.

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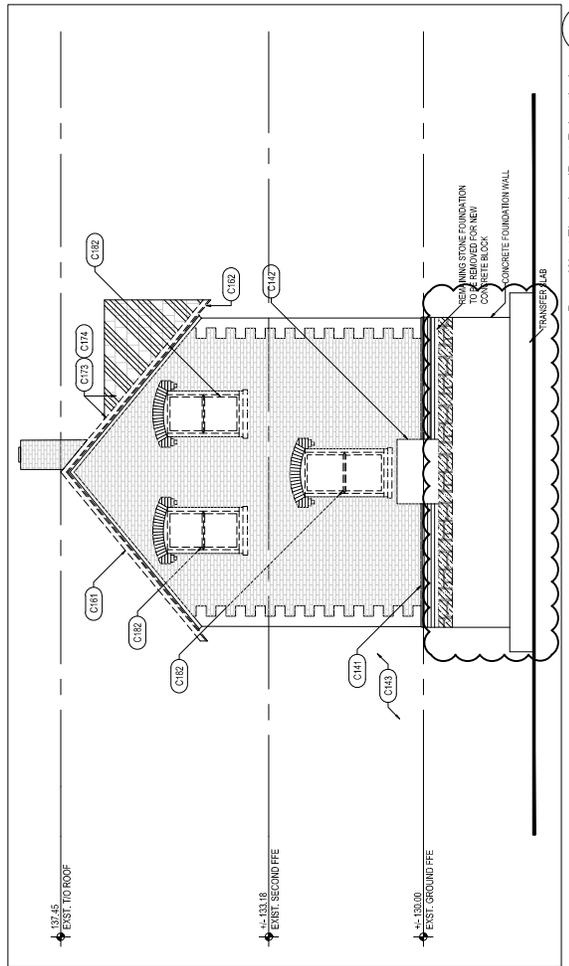
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3	2020-12-09	REVISED CONSERVATION PLAN
4	2020-12-09	REVISED CONSERVATION PLAN

LEGEND	DESCRIPTION
	PROTECT OPENINGS
	SAVAGE BRICKS
	REMOVE ROOFING
	REMOVE PLASTER
	SAVAGE BRICKS

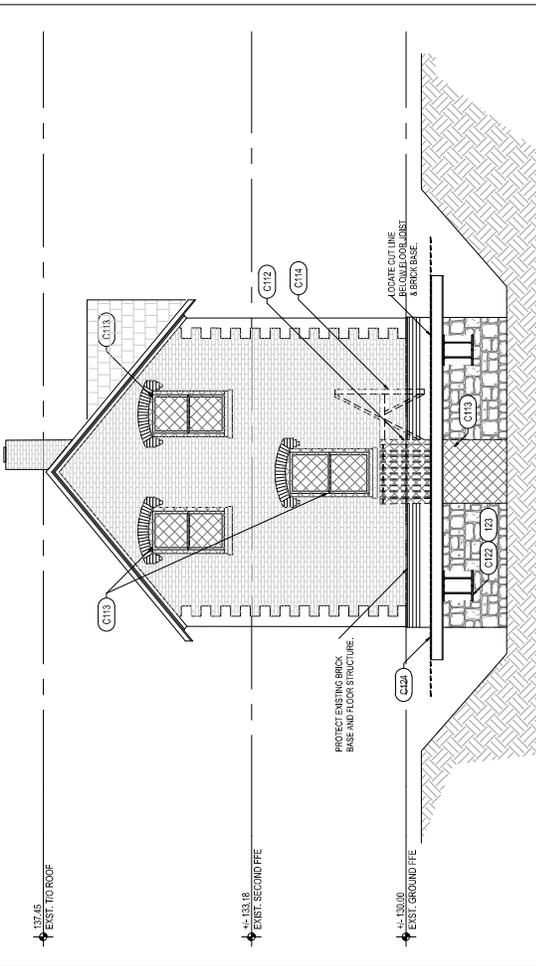
**E R A**  
 E.R.A. Architects Inc.  
 433 Church Street, Suite 600  
 Toronto, ON, Canada, M5E 1P5  
 Tel: 416.923.1417 | Fax: 416.923.1819  
 www.eraarchitects.com

Project: 292 Main Street  
 Address: 292 Main Street Toronto, ON  
 For: Conservation Plan  
 Project no: 17-096-05  
 Scale at 1/14/17: 1:100  
 Drawn by: H.M. Linc/MS/AP3  
 Reviewed by: DL  
 Drawing title: Demo West Elevations

Sheet no. H132



Demo West Elevation (Post-Relocation)  
 Scale 1:100  
 2 H132



Demo West Elevation (Pre-Relocation)  
 Scale 1:100  
 1 H132

- C127 RAISE BUILDING TO ACCOMMODATE DOLLIES UNDER EACH BEAM AT THE SAME LEVEL AS THE TOP OF THE TRANSFER SLAB.
- C128 PLACE SECONDARY NEEDLES BETWEEN THE CROSS BEAMS, AND PACK TIGHT.
- C129 MOVE BUILDING & SECURE TO FINAL LOCATION BASEMENT.
- C130 - PREPARE PATH OF RELOCATION, LAY TIMBER ROAD IN THE BUILDING. INSTALL DOLLIES UNDER THE CROSS BEAMS, REPLACING THE CRIB PILES. SHUT DOLLIES INTO ZONES AND CONNECT HYDRAULICALLY.
- C131 WHICH THE BUILDING AWAY FROM THE FOUNDATION AND OVER TO THE NEW TRANSFER SLAB.
- C132 REMOVE DOLLIES. PUT CRIBBING PILES IN PLACE.
- C133 JACK BUILDING DOWN AND LEVEL TO ITS PERMANENT POSITION.
- C134 REMOVE SECONDARY NEEDLES.
- C135 BUILD NEW FOUNDATION BETWEEN THE CROSS BEAMS, FOR NEW FOUNDATION DETAILS. SEE ARCHITECTURAL.
- C136 PIN FOUNDATION TO THE UNDERSIDE OF THE BRICK, ONCE THE BUILDING IS FULLY PINNED AND SUPPORTED, THE FRAMEWORK WILL THEN BE RELIEVED.
- C137 REMOVE RELOCATION STRUCTURE, AND REFILL REMAINING OPENINGS.
- C138 POST-RELOCATION
- C139 CAREFULLY DISMANTLE & SALVAGE GOOD QUALITY ORIGINAL BRICKS WHERE DEMOLITION IS REQUIRED. BRICK REMOVAL REQUIRED FOR NEW OPENINGS. SALVAGE SUFFICIENT QUANTITIES TO COMPLETE CONSERVATION WORK.
- C140 MASONRY OPENING TO BE INFILLED WITH SALVAGED BRICKS, MATCH EXISTING AND ADJACENT BRICK AREAS.
- C141 REMOVE RELOCATION STRUCTURE.
- C142 REMOVE ALL REDUNDANT AND MISCELLANEOUS FASTENERS, ELECTRICAL LIGHTS, CONDUITS, EQUIPMENT, SIGNAGE AND CLADDING THAT REMAIN.
- C143 REMOVE WOOD SOFFIT (TYP.)
- C144 REMOVE EXTERIOR GRADE SHEATHING USED FOR THE PROTECTION OF ALL WINDOW AND DOOR OPENINGS.
- C145 REMOVE DOWNPOUTS (TYP.)
- C146 REMOVE ROOFING MATERIAL (TYP.)
- C147 DOCUMENT CONDITIONS OF ROOF DECK ASSEMBLY ONCE PROTECTED BY THE INSTALLATION OF ROOF CLADDING. REPAIR/REPLACE AS REQUIRED.
- C148 REMOVE & SALVAGE MAIN DOOR.
- C149 REMOVE ALL WINDOWS, WINDOWS ARE NON-ORIGINAL TO THE STRUCTURE. REMOVE WINDOW FRAME, SILL, AND OTHER HARDWARE.
- C150 REMOVE LOUVER FOR SHOP REPAIR.
- C151 REMOVE STUCCO ON MASONRY & ON THE INSIDE OF DEMOLISHED WOOD PORCH.
- C100 - HERITAGE DEMOLITION
- C101 - GENERAL NOTES - HERITAGE APPLIES IN THIS SECTION AS IF REPEATED HERE.
- C102 HERITAGE DEMOLITION REFERS TO THE CONSTRUCTION PHASE INVOLVING THE PROTECTION, SALVAGE, AND REMOVAL OF HERITAGE FEATURES, MATERIALS, AND ELEMENTS AS REQUIRED.
- C103 COORDINATE HERITAGE DEMOLITION WITH THE DEMOLITION OF OTHER BUILDINGS WITHIN THE PROPERTY. DEMOLITION OF OTHER BUILDINGS TO BE DONE BY OTHERS.
- C104 PROVIDE SHOP DRAWINGS FOR RELOCATION STRUCTURE AND STRUCTURAL ENGINEER.
- C105 COORDINATE HERITAGE DEMOLITION POST RELOCATION WITH THE START DATE OF CONSERVATION WORK. DO NOT BEGIN UNTIL START DATE OF CONSERVATION WORK HAS BEEN FINALIZED.
- PRE-RELOCATION
- C110 - PREPARE SITE & BUILDING FOR RELOCATION
- C111 REMOVE & DISPOSE WOOD PORCH ON EAST ELEVATION, INCLUDING PORCH DOOR, WINDOWS, ROOF, INTERIOR WOOD TRIMS, WALL FLOOR, AND CEILING FINISHES.
- C112 REMOVE & DISPOSE WOOD SHED ON REAR WEST ELEVATION. BELOW-GRADE CONDITION OF SHED & MASONRY WITHIN SHED, UNKNOWN.
- C113 PROTECT DOOR & WINDOW OPENINGS ABOVE BASEMENT LEVEL. USE EXTERIOR GRADE SHEATHING.
- C114 REMOVE ALL REDUNDANT EXTERIOR ATTACHMENTS ON ALL ELEVATIONS. ATTACHMENTS INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL CONDUITS, MISCELLANEOUS FASTENERS, EQUIPMENT, SIGNAGE AND CLADDING.
- C115 CLEAR THE INTERIORS. REMOVE RUBBLE, FURNITURE, AND OTHER ELEMENTS. CLEAR THE BASEMENT FROM ANY OBSTRUCTIONS DISALLOWING THE INSTALLATION OF RELOCATION STRUCTURE.
- C116 INSPECT SOUNDNESS OF REMAINING STRUCTURE PROVIDE ADDITIONAL BRACING AS REQUIRED FOR BRACING WORK, REFER TO STRUCTURAL.
- C117 COORDINATE WITH OWNER'S OWN FORCES ON THE REMOVAL OF 4' HIGH PROTECTION BOARD AT BASE OF BUILDING.
- C120 - INSTALL TEMPORARY STRUCTURE.
- C121 CLEAR & EXCAVATE BUILDING PERIMETER TO THE WIDTH AND DEPTH REQUIRED TO INSTALL RELOCATION STRUCTURE.
- C122 PROTECT STEPPED BRICK BASE AND FLOOR STRUCTURE. LOCATE CUT LINE AT FOUNDATION WALL. CAREFULLY DEMOLISH FOUNDATION WALL TO ACCOMMODATE RELOCATION STRUCTURE.
- C123 INSTALL THE MAIN BEAMS OF THE RELOCATION STRUCTURE. LEVEL AT DESIRED HEIGHT. REST MAIN BEAMS ON TIMBER CRIP PILES THAT EXTEND TO THE EXTERIOR FLOOR.
- C124 INSERT CROSS BEAMS THROUGH THE FOUNDATION WALLS TO WINDOW OPENINGS. PACK THE CROSS BEAM ENDS WITH HYDRAULIC JACKS. BRICK HERITAGE WALL AND INTERIOR MASONRY WALLS.
- C125 PLACE NEELE BEAMS AT THE END OF THE FOUNDATION WALLS. INSERT NEELE BEAMS, PACK TO BRICK LINE. INSERT ONE CROSS LONBER AND PACK AT A TIME. PACK FIRST FLOOR JOIST TO THE CROSS BEAMS. INSTALL ANY NECESSARY BRACING FOR WEAK POINTS.
- C126 PLACE HYDRAULIC JACKS IN THE CRIBBING PILES AND ATTACH TO A UNIFIED JACKING SYSTEM.

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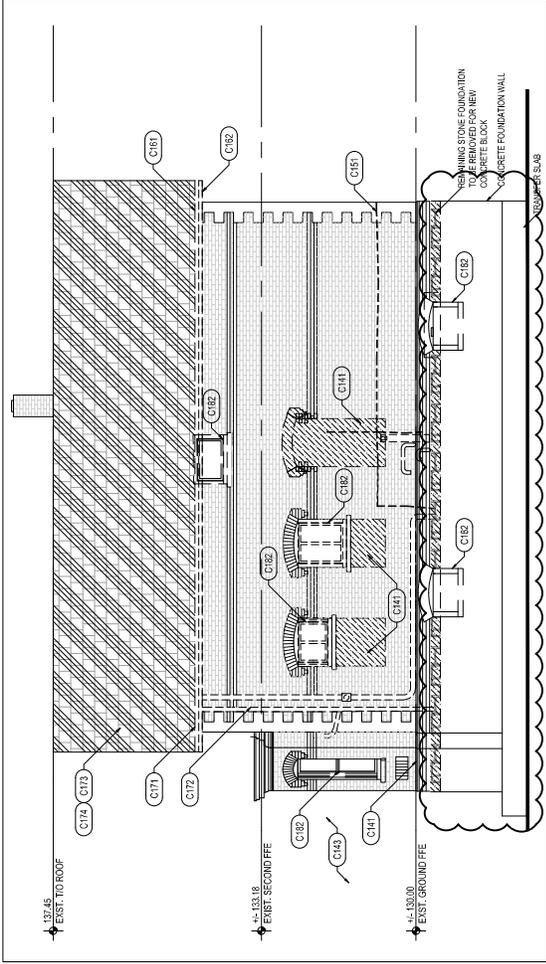
NO.	DATE	ISSUED FOR
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2	2020-11-25	REVISED CONSERVATION PLAN
3	2020-12-02	REVISED CONSERVATION PLAN
4	2020-12-09	REVISED CONSERVATION PLAN

LEGEND

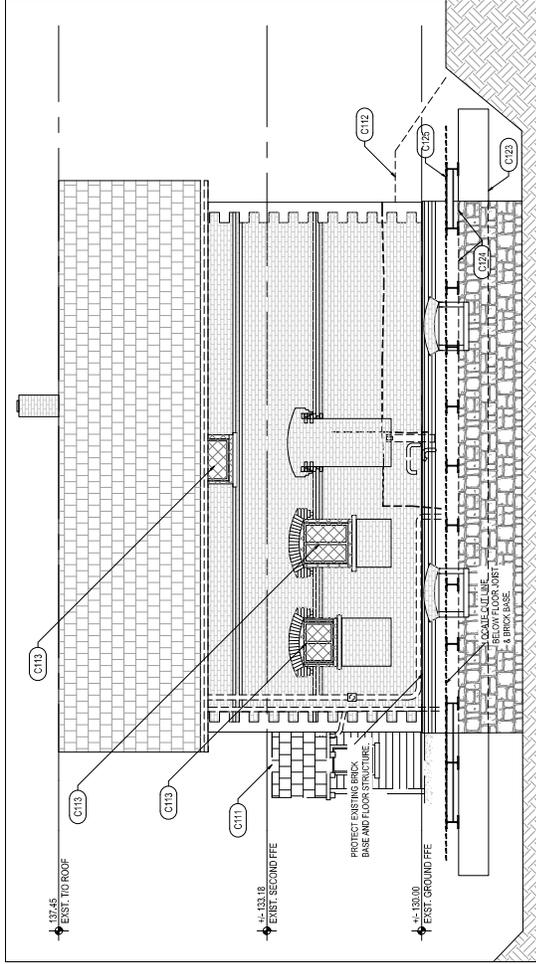
**E R A**  
 E.R.A. Architects Inc.  
 416-963-6477 | P: 416-963-3381  
 483 Church Street, Suite 400  
 Toronto, ON, Canada M5T 2P1

Project: 292 Main Street  
 Address: 292 Main Street Toronto, ON  
 For: Conservation Plan  
 Project no.: 17-095-05  
 Scale at 11x17: 1 : 100  
 Drawn by: HML/LMC/MS/AP3  
 Reviewed by: DL  
 Drawing title: Demolition North Elevations

Sheet no.: H133



2 Demo North Elevation (Post-Relocation)  
 Scale 1:100



1 Demo North Elevation (Pre-Relocation)  
 Scale 1:100

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2	2020-11-25	REVISED CONSERVATION PLAN
3	2020-12-02	REVISED CONSERVATION PLAN
4	2020-12-09	REVISED CONSERVATION PLAN

**LEGEND**

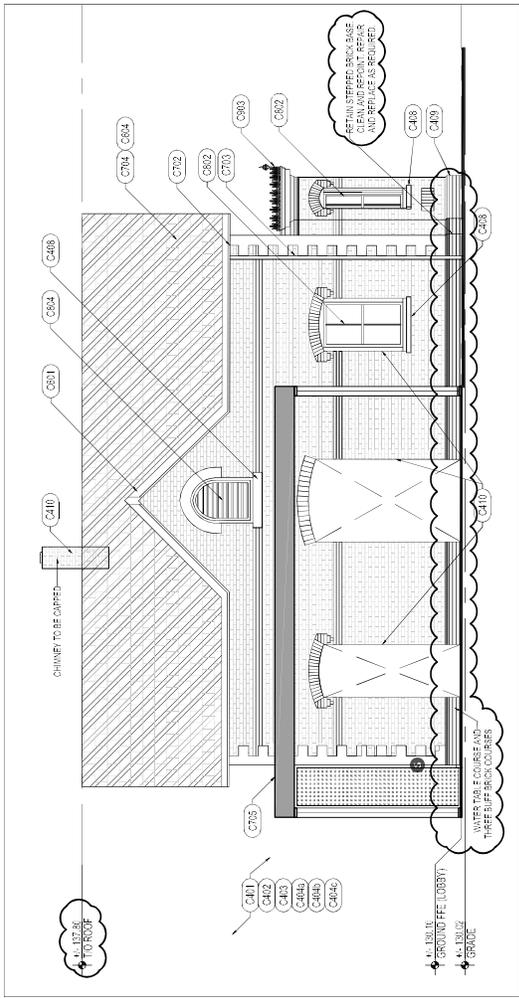
- CLEAN SOILED BRICKS
- REPAIR CRACKS
- PRIME & PAINT WOOD
- INFILL WITH SALVAGED BRICKS
- REBUILD WITH SALVAGED BRICKS
- REPLACE ROOFING
- REPAIR-HOLE OR CHIP IN BRICKWORK
- REMOVE GRAFFITI FROM BRICKWORK



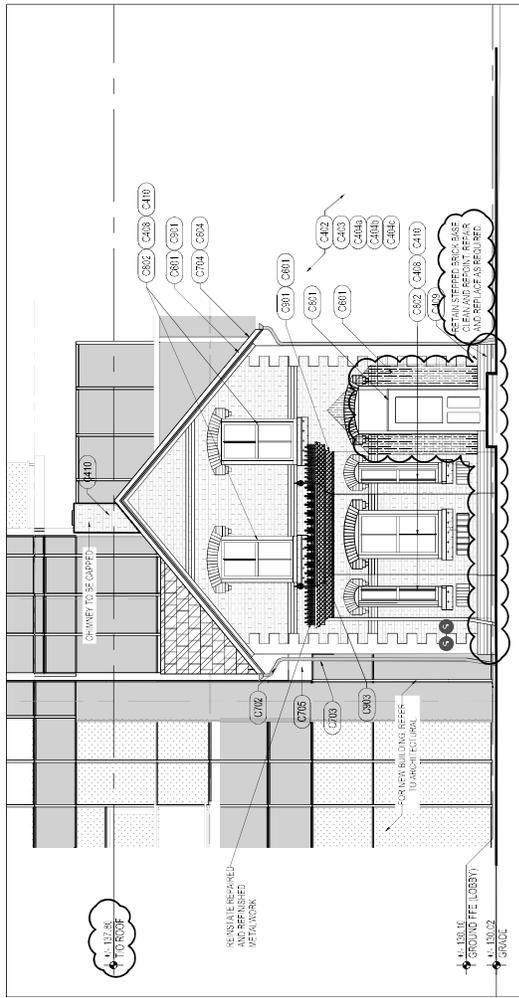
ERA  
Architects Inc.  
100 UNIVERSITY AVENUE, SUITE 1000  
TORONTO, ONTARIO, CANADA M5G 1S7  
TEL: 416-593-1111  
WWW.ERAARCHITECTS.COM

Project: 292 Main Street  
Address: 292 Main Street Toronto, ON  
For: Conservation Plan  
Project no.: 17-066-05  
Scale as of: 1:100  
Drawn by: ERA  
Reviewed by: DL  
Drawing title: Proposed East & West Elevations

Sheet no.: H230  
Proposed East & West Elevations



South Elevation  
Scale 1:100  
1 H230



East Elevation  
Scale 1:100  
1 H230

- C600 - WOOD CONSERVATION
  - C601 - PROVIDE WOOD FASCIA, MATCHING ORIGINAL PROFILE.
  - C602 - PROVIDE WOOD SOFFIT, MATCHING ORIGINAL PROFILE. (RESERVED)
  - C603 - INSPECT CONDITIONS OF ROOF-DECK ASSEMBLY WITH OWNER & HERITAGE ARCHITECT. REPAIR AND REPLACE ALL RAFTERS AND JOISTS THAT ARE IN POOR CONDITION. RAFTERS AND JOISTS MAY BE REQUIRED TO BE REPLACED.
  - C604 - INSPECT CONDITIONS OF ROOF-DECK ASSEMBLY WITH OWNER & HERITAGE ARCHITECT. REPAIR AND REPLACE ALL RAFTERS AND JOISTS THAT ARE IN POOR CONDITION. RAFTERS AND JOISTS MAY BE REQUIRED TO BE REPLACED.
- C700 - ROOFING CONSERVATION
  - C701 - PROVIDE NEW PRE-FINISHED METAL (PFM) FLASHING.
  - C702 - PROVIDE NEW PFM EAVES TROUGH.
  - C703 - PROVIDE NEW PFM DOWNSPOUTS.
  - C704 - PROVIDE NEW ASPHALT SHINGLES.
  - C705 - PROVIDE NEW LOW-ROOF ASSEMBLY REFER TO DWG J-H272.
- C800 - WINDOW AND DOOR CONSERVATION
  - C801 - PROVIDE NEW WOOD DOOR WITH WINDOW TRANSOM. NEW DOOR TO BE ASSESS AND TO PROVIDE BARBER FREE ACCESS.
  - C802 - PROVIDE NEW WOOD FRAME WINDOW WITH CLEAR INSULATED GLAZING UNITS, REMOVE AND PAINT WOOD FRAME (C902). REFER TO DWG J.3-H272.
  - C803 - (RESERVED)
  - C804 - REINSTATE REPAIRED LOUVER ON THE SOUTH WALL.
- C900 - FINISHES
  - C901 - PROVIDE COLOUR SAMPLES OF FINISH PAINT AS REQUIRED TO DETERMINE COMPATIBILITY WITH HERITAGE BUILDING. FOR ALL INTERIOR FINISHES, REFER TO ARCHITECTURAL.
  - C902 - PRIME AND PAINT EXTERIOR WOOD FASCIA SOFFIT AND TRIMS.
  - C903 - PRIME AND PAINT WOOD DOOR & WINDOW FRAME.
  - C904 - PRIME AND PAINT WOOD DOOR & WINDOW ON BAY WINDOW.
- C400 - MASONRY CONSERVATION
  - C401 - INSPECT CONDITIONS OF REINFORCED CONCRETE MASONRY WITH OWNER & HERITAGE ARCHITECT. SITE-SPECIFIC BRICK AREAS BEHIND REMOVED WOOD PATCH.
  - C402 - CLEAN ALL BRICKS ON MASONRY FROM SOILING, DISCOLORATION, AND SLUDGE USING IMPRESSURE HOT WATER WASH. CLEAN MASONRY AREAS AT WALL BEHINDS, INCLUDING AREAS AROUND REMOVED DOOR AND WINDOW FRAMES.
  - C403 - IF GRAFFITI AND HEAVY SOILING REMAINS ON MASONRY AFTER WATER WASH (SEE C402), PROVIDE ANOTHER NON-ABRASIVE CLEANING METHOD. PROVIDE SITE MOCKUPS FOR REVIEW AND APPROVAL BY HERITAGE ARCHITECT. OBTAIN WRITTEN APPROVAL BY HERITAGE ARCHITECT PRIOR TO THE FULL APPLICATION OF APPROVED CLEANING METHOD.
  - C404 - REPOINT ALL EXTERIOR MASONRY USING COMPATIBLE MORTAR. MATCH EXISTING AND ADJACENT MORTAR THAT IS IN GOOD CONDITION. MATCH COLOUR, PROFILE AND TOOL JOINT.
  - C405 - FOLLOWING REPOINTING WORK, PROVIDE BRICK WASH ON ALL ELEVATIONS. PROVIDE HOT DYE RED WASH ON RED BRICK AREAS. PROVIDE RED WASH ON RED BRICK AREAS. FOLLOWING BRICK WASH, PROVIDE TOUCH UP COLOUR ON ALL OF THE EAST AND SOUTH ELEVATIONS.
  - C406 - REPLACE BRICKS OR MASONRY BRICKS WITH SALVAGED BRICKS. MATCH EXISTING AND ADJACENT BRICKS THAT ARE IN GOOD CONDITION. MATCH SIZE, COLOUR, TEXTURE AND PROFILE.
  - C407 - INFILL OPENING WITH SALVAGED BRICKS. RECES INFILL BY +/- 25MM TO MARK LOCATION OF ORIGINAL OPENINGS.
  - C408 - REPLACE ALL WINDOW SILLS WITH NEW STONE SILLS. TEMPORARILY REMOVE BRICKS AT SILL LOCATIONS ONLY AS REQUIRED TO ALLOW NEW STONE SILL TO BE KEPT IN THE MASONRY. REINSTATE REMOVED BRICKS AND REPOINT USING COMPATIBLE MORTAR. BRICK BASE TO REMAIN.
  - C409 - REPAIR DAMAGED BRICK, INCLUDING THOSE ATTACHED WITH REDUNDANT ACCESSORIES AND THOSE AT THE CHIMNEY. REPOINTING AND REPLACEMENT THAT IS REQUIRED.
  - C410 - REPAIR DAMAGED BRICK, INCLUDING THOSE ATTACHED WITH REDUNDANT ACCESSORIES AND THOSE AT THE CHIMNEY. REPOINTING AND REPLACEMENT THAT IS REQUIRED.



*Tribute (Danforth) Limited  
Pre-Existing Elements Fund Study  
292 Main Street, Toronto, ON  
BRM-2100944-A0  
December 7, 2021*

## Appendix F: Appendix F: Designated Substance Survey (by Terraprobe Inc.)



# Terraprobe

Consulting Geotechnical & Environmental Engineering  
Construction Materials Inspection & Testing

## DESIGNATED SUBSTANCE SURVEY 276-294 MAIN STREET TORONTO, ONTARIO

**Prepared for:** **Tribute (Danforth) Limited**  
1815 Ironstone Manor  
Unit 1  
Pickering, ON  
L1W 3W9

**Attention:** Mr. Mark Iogna

File No. 1-17-0005-48.2  
November 25, 2019

© **Terraprobe Inc.**

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### Terraprobe Inc.

#### Greater Toronto

11 Indell Lane  
**Brampton**, Ontario L6T 3Y3  
(905) 796-2650 Fax: 796-

#### Hamilton – Niagara

903 Barton Street, Unit 22  
**Stoney Creek**, Ontario L8E 5P5  
(905) 643-7560 Fax: 643-7559

#### Central Ontario

220 Bayview Drive, Unit  
**Barrie**, Ontario L4N 4Y8  
(705) 739-8355 Fax: 739-

#### Northern Ontario

1012 Kelly Lake Rd., Unit 1  
**Sudbury**, Ontario P3E 5P4  
(705) 670-0460 Fax: 670-

[www.terraprobe.ca](http://www.terraprobe.ca)

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### FIGURES:

Figure 1 – Property Location

Figure 2 – Property Layout

Figure 3 – Sample Location Plan – 276 Main Street

Figure 4 – Sample Location Plan – 286 Main Street

Figure 5 – Sample Location Plan – 288 & 290 Main Street

Figure 6 – Sample Location Plan – 292 Main Street

Figure 7 – Sample Location Plan – 294 Main Street



**APPENDICES:**

Appendix A – Certificates of Analysis

Appendix B – Site Photographs

Appendix C – Ontario Regulation 278/05

Appendix D – Guideline - Lead on Construction Projects

Appendix E – SafeTech Environmental Ltd. DSS Report



## 1.0 INTRODUCTION

Tribute (Danforth) Limited retained Terraprobe Inc. (Terraprobe) to conduct a Designated Substances Survey (DSS) at the property located at 276 – 294 Main Street, Ontario (The “Property”). The purpose of this DSS report is to identify and document the designated substances found at the Property prior to the demolition of all existing structures.

Previous Designated Substance Surveys have been conducted at the Property by Terraprobe (2017) and SafeTech Environmental Ltd. (2017) and have been used to supplement the information collected in this Terraprobe 2019 investigation.

The Occupational Health and Safety Act (OHSA- RSO 0.1/90) defines Designated Substances as materials which require special provisions for handling, storage or disposal in the event of disturbance by demolition or renovation. OHSA legislation provides regulations to prescribe worker exposure limits, handling and disposal practices for specific Designated Substances. Currently, the following substances have been listed as designated by OHSA and are controlled by the referenced regulations below:

*Asbestos: regulated under the OHSA- O.Reg.278/05 and on Construction Projects under O.Reg.838/90 and Ontario Regulation 490/09*

*Lead: regulated under OHSA- O.Reg.843/90, now included in Ontario Regulation 490/09*

*Mercury: regulated under OHSA- O.Reg.851/90, now included in Ontario Regulation 490/09*

*Silica: regulated under OHSA- O.Reg.845/90, now included in Ontario Regulation 490/09*

*Vinyl Chloride: regulated under OHSA- O.Reg.846/90, now included in Ontario Regulation 490/09*

*Coke Oven Emissions: regulated under OHSA- O.Reg.840/90, now included in Ontario Regulation 490/09*

*Isocyanates: regulated under OHSA- O.Reg.842/90, now included in Ontario Regulation 490/09*

*Arsenic: regulated under OHSA- O.Reg.836/90, now included in Ontario Regulation 490/09*

*Ethylene Oxide: regulated under OHSA- O.Reg.841/90, now included in Ontario Regulation 490/09*

*Benzene: regulated under OHSA- O.Reg.839/90, now included in Ontario Regulation 490/09*

*Acrylonitrile: regulated under OHSA- O.Reg.835/90, now included in Ontario Regulation 490/09*

*Polychlorinated Biphenyls (PCB's)\*- regulated under EPA- O.Reg.347/90 & O.Reg.362/90; also regulated under the Canadian Environmental Protection Act (CEPA) regulations SOR/91-152 and SOR/92-507*

*Ozone Depleting Substances (CFC's)- General Reg. 356/90 as amended by O. Reg.851/93 and O.Reg.189/94*

*\*NOTE: Although PCB's and CFC's are not currently listed as a Designated Substance by OHSA Act, they have been included in the study since they are building substances that require special disposal.*

The Designated Substances Regulation (O.Reg.490/09) is a consolidation of all Designated Substances into a single regulation. Regulation 490/09 came into effect in July 2010.



Based on the age of the buildings, the possibility exists that some of the above-noted designated substances may be found on the Property, especially asbestos-containing building materials, PCB-containing electrical fixtures, and lead-based paint. Therefore, a survey was conducted to determine if any of these materials were present. The survey was conducted in accordance with the requirements of the above-noted regulations. Terraprobe conducted a site visit on October 7, 2019 to visually inspect the premises and secure samples of materials potentially containing Designated Substances.

## 2.0 GENERAL ARRANGEMENT

The subject site is located on the west side of Main Street, approximately 30 m south of Danforth Avenue, in Toronto, Ontario. There are five (5) buildings located on the site, as listed below:

- 276 Main Street is a two-storey commercial building which is occupied by a dance studio and private storage units. The building is constructed of stones and vinyl siding, and has a flat tar and gravel roof.
- 286 Main Street is a single storey retail building which is occupied by La Perla Grigia Fashion Boutique. The building is a brick structure with vinyl siding and a flat tar & gravel roof.
- 290 Main Street is a two storey mixed-use building, previous occupied by Grumbel's Deli on the main floor and a residential apartment on the 2<sup>nd</sup> floor. The building is a brick structure with a flat tar and gravel roof.
- 292 Main Street is a two-storey house which is occupied by a walk-in clinic. The building is constructed of wood joists, brick walls, and a shingled roof.
- 294 Main Street is a five-storey office building which is occupied by various medical offices. It is constructed of brick and has a flat tar and gravel roof.

All five (5) buildings are heated by natural-gas fired furnaces, and all buildings have air conditioning units. The interiors of the buildings were generally finished with carpet, hardwood, vinyl floor tiles, ceramic tiles, drywall, acoustic ceiling tiles, fluorescent lighting and incandescent lights. There are also two small plywood garage structures at the rear of the site which are used for parking and/or storage by tenants.

It is noted that Terraprobe Inc. and SafeTech Environmental Inc. have previously conducted Designated Substance Surveys at the Property. Not all units in the buildings were accessible during these site inspections. The upper levels at 290 and 292 Main Street, and the entire interior of 286 Main Street could not be accessed by Terraprobe during the site visit in 2017. The DSS conducted by SafeTech Environmental Ltd. in 2017 only covers the building at 276 Main Street, Toronto.

During this DSS conducted by Terraprobe in 2019, all units in the buildings were accessible including the upper levels of 290 and 292 Main Street, the interior of 286 Main Street and the entirety of 276 Main Street. The previous DSS reports were used to supplement this investigation. The SafeTech Environmental Ltd. DSS report can be found in Appendix E.



### 3.0 SURVEY RESULTS

#### 3.1 Asbestos

An asbestos-containing material is classified as a material that contains a minimum of 0.5 % Asbestos by dry weight. In accordance with O.Reg. 278/05, three (3) representative samples must be obtained of surfacing materials and thermal insulation. A total of 117 locations of various building materials suspected of containing asbestos were sampled across the five (5) building structures at the Property during the Terraprobe Inc. and SafeTech Environmental Inc. site visits.

The following material types were identified on the Property, that could contain asbestos:

- Suspended Ceiling Tile (SCT)
- Floor Tile (FT)
- Potential Asbestos-containing Material (ASB)
- Thermal System Insulation (TSI)
- Drywall Joint Compound (JC)

The sample locations are indicated on Figures 3 to 7 ‘*Sample Location Plan*’. Photographs representative of the sampling that occurred is provided in Appendix B ‘*Site Photographs*’.

The asbestos samples collected at the Property are as follows:

Sample Identification	Material Type	Sample Location	Asbestos Content	
<b>276 Main Street – Figure 3</b>				
<b>Terraprobe Inc. (2019)</b>	<b>ASB-4-19</b>	Stucco coating	Basement – electrical room	None Detected
	<b>ASB-5-19</b>	Off white stucco coating	Basement – studio room ceiling	None Detected
	<b>ASB-6-19</b>	Light orange stucco coating	Basement – east wall	None Detected
	<b>ASB-7-19</b>	Off white stucco coating	Basement – furnace wall	None Detected
	<b>ASB-8-19</b>	Material column cover	1st floor, north dance studio	None Detected
	<b>ASB-9-19</b>	Window seal towards roof	2nd floor	None Detected
	<b>ASB-10-19</b>	Window seal	Exterior - south window on rooftop	None Detected
	<b>ASB-11-19</b>	Roof felt	Exterior - roof	None Detected
	<b>ASB-12-19</b>	Roofing tar	Exterior – roof	None Detected



Sample Identification		Material Type	Sample Location	Asbestos Content
Terraprobe Inc. (2019)	FT-5-19	12"x 12" tiles, light grey	Basement	None Detected
	FT-6-19	12"x 12" tiles, light brown	1st floor	0.5-5% chrysotile asbestos
	FT-7-19	12"x 12" tiles, red-brown	1st floor	None Detected
	FT-8-19	12"x 12" tiles, of white	1st floor	None Detected
	FT-9-19	12"x 12" tiles, light brown	1st floor, closet	None Detected
	FT-10-19	12"x 12" tiles, light orange	1 <sup>st</sup> floor	None Detected
	FT-11-19	12"x 12" tiles, light grey	2nd floor	None Detected
	FT-12-19	12"x 12" tiles, brown	2nd floor	None Detected
	FT-13-19	12"x 12" tiles, of white	2nd floor	None Detected
	JC-8-19	Drywall joint compound	Basement	None Detected
	JC-9-19	Drywall joint compound	Basement	None Detected
	JC-10-19	Drywall joint compound	1st floor	None Detected
	JC-11-19	Drywall joint compound	1st floor	None Detected
	JC-12-19	Drywall joint compound	2nd floor	None Detected
	JC-13-19	Drywall joint compound	2nd floor	None Detected
	JC-14-19	Drywall joint compound	2nd floor	None Detected
	JC-15-19	Drywall joint compound	2nd floor bedroom	None Detected
	SCT-9-19	Ceiling tile	1 <sup>st</sup> floor	None Detected
<b>286 Main Street – Figure 4</b>				
Terraprobe Inc. (2017)	ASB-4	Window caulking	Exterior windows of building	None Detected
Terraprobe Inc. (2019)	FT-2-19	9"x 9" tiles, multiple colours	Basement – staircase	None Detected
	FT-3-19	12"x 12" tiles, black & white	1st floor	None Detected



Sample Identification	Material Type	Sample Location	Asbestos Content	
<b>286 Main Street – Figure 4</b>				
Terraprobe Inc. (2019)	SCT-7-19	Ceiling tile	1 <sup>st</sup> floor	None Detected
	SCT-8-10	Ceiling tile	1 <sup>st</sup> floor	None Detected
<b>288-290 Main Street – Figure 5</b>				
Terraprobe Inc. (2017)	ASB-5	Window caulking	Exterior windows of building	0.5-5% <i>chrysotile asbestos</i>
	JC-19	Drywall joint compound	Main floor, main room	None Detected
	TSI-1 / PIPE-1	White pipe insulation	On pipe in back room of basement	>75 % <i>chrysotile asbestos</i>
	TSI-2	White pipe insulation	On pipe in main room of basement	>75 % <i>chrysotile asbestos</i>
Terraprobe Inc. (2019)	ASB-3-19	Roof felt	Exterior – roof patio	None Detected
	FT-1-19	12” x 12” tiles, white	1 <sup>st</sup> floor	None Detected
	FT-4-19	Linoleum, off white	2 <sup>nd</sup> floor	None Detected
	JC-6-19	Drywall joint compound	2 <sup>nd</sup> floor	None Detected
<b>292 Main Street – Figure 6</b>				
Terraprobe Inc. (2017)	ASB-2	White stucco coating	On walls in the main room of the basement	0.5-5% <i>chrysotile asbestos</i>
	ASB-3	Roofing shingles	Roof on rear garage	None Detected
	FT-11	Beige vinyl floor tiles	In basement, at stairwell to main floor	None Detected
	JC-17	Drywall joint compound	Main floor, near front door	None Detected
	JC-18	Drywall joint compound	Main floor, at bottom of stairway to 2 <sup>nd</sup> floor	None Detected
Terraprobe Inc. (2019)	ASB-2-19	Off white stucco coating	2 <sup>nd</sup> floor, office	None Detected
	JC-5-19	Drywall joint compound	2 <sup>nd</sup> floor, livingroom	None Detected
	JC-15-19	Drywall joint compound	2 <sup>nd</sup> floor, bedroom	None Detected



Sample Identification	Material Type	Sample Location	Asbestos Content	
<b>294 Main Street Figure 7</b>				
<b>Terraprobe Inc. (2017)</b>	<b>ASB-1</b>	Spray-on ceiling insulation	Basement utility room	None Detected
	<b>FT-1</b>	Beige vinyl floor tiles	Basement utility room	None Detected
	<b>FT-2</b>	Off-white vinyl floor tiles	Basement, stairwell by elevators	None Detected
	<b>FT-3</b>	White vinyl floor tiles	1 <sup>st</sup> floor, suite 102	0.5-5% chrysotile asbestos
	<b>FT-4</b>	Blue vinyl floor tiles	1 <sup>st</sup> floor, suite 102	None Detected
	<b>FT-5</b>	Beige vinyl floor tiles	5 <sup>th</sup> floor, suite 501b	None Detected
	<b>FT-6</b>	Beige vinyl floor tiles	4 <sup>th</sup> floor, Suite 407	None Detected
	<b>FT-7</b>	Off white vinyl floor tiles	3 <sup>rd</sup> floor, suite 305	0.5-5% chrysotile asbestos
	<b>FT-8</b>	White vinyl floor tiles	1 <sup>st</sup> floor, suite 101	None Detected
	<b>FT-9</b>	Dark pink vinyl floor tiles	1 <sup>st</sup> floor, suite 103	None Detected
	<b>FT-10</b>	Light pink vinyl floor tiles	1 <sup>st</sup> floor, suite 103	None Detected
	<b>JC-1</b>	Joint compound	Basement utility room	None Detected
	<b>JC-2</b>	Drywall compound	1 <sup>st</sup> floor, suite 102	None Detected
	<b>JC-3</b>	Drywall joint compound	5 <sup>th</sup> floor, vacant suite	None Detected
	<b>JC-4</b>	Drywall joint compound	5 <sup>th</sup> floor, suite 501b	None Detected
	<b>JC-5</b>	Drywall joint compound	5 <sup>th</sup> floor, suite 507	None Detected
	<b>JC-6</b>	Drywall joint compound	5 <sup>th</sup> floor, suite 501a	None Detected
	<b>JC-7</b>	Drywall joint compound	5 <sup>th</sup> floor, stairwell by suite 501b	None Detected
	<b>JC-8</b>	Drywall joint compound	4 <sup>th</sup> floor, suite 401 (exterior hallway)	None Detected
	<b>JC-9</b>	Drywall joint compound	4 <sup>th</sup> floor, suite 407	None Detected
	<b>JC-10</b>	Drywall joint compound	4 <sup>th</sup> floor, suite 403	None Detected
	<b>JC-11</b>	Drywall joint compound	3 <sup>rd</sup> floor, suite 301	None Detected
<b>JC-12</b>	Drywall joint compound	3 <sup>rd</sup> floor, suite 305	None Detected	



Sample Identification	Material Type	Sample Location	Asbestos Content	
<b>294 Main Street – Figure 7</b>				
<b>Terraprobe Inc. (2017)</b>	JC-13	Drywall joint compound	2 <sup>nd</sup> floor, suite 205	None Detected
	JC-14	Drywall joint compound	2 <sup>nd</sup> floor, suite 202	None Detected
	JC-15	Drywall joint compound	1 <sup>st</sup> floor, suite 103	None Detected
	JC-16	Drywall joint compound	Main floor, Optimart, main room	None Detected
	SCT-1	White acoustic ceiling tiles	Basement utility room	<i>0.5-5% amosite asbestos</i>
	SCT-2	White acoustic ceiling tiles	5 <sup>th</sup> floor, vacant suite	<i>0.5-5% amosite asbestos</i>
	SCT-3	White acoustic ceiling tiles	5 <sup>th</sup> floor, suite 501b	<i>0.5-5% amosite asbestos</i>
	SCT-4	White acoustic ceiling tiles	3 <sup>rd</sup> floor, suite 301	<i>0.5-5% amosite asbestos</i>
	SCT-5	White acoustic ceiling tiles	3 <sup>rd</sup> floor suite 307	None Detected
	SCT-6	White acoustic ceiling tiles	1 <sup>st</sup> floor, suite 103	None Detected
<b>Terraprobe Inc. (2019)</b>	ASB-1-19	Roof felt	Exterior - roof	None Detected
	JC-1-19	Drywall joint compound	1st floor	None Detected
	JC-2-19	Drywall joint compound	2nd floor	None Detected
	JC-3-19	Drywall joint compound	3rd floor, hallway	None Detected
	JC-4-19	Drywall joint compound	4th floor, suite 401	None Detected
	SCT-1-19	Ceiling Tile	1 <sup>st</sup> floor, suite 101	<i>0.5-5% amosite asbestos</i>
	SCT-2-19	Ceiling Tile	1 <sup>st</sup> floor, Pharmacy	<i>0.5-5% amosite asbestos</i>
	SCT-3-19	Ceiling Tile	2 <sup>nd</sup> floor, suite 201	None Detected
	SCT-4-19	Ceiling Tile	2 <sup>nd</sup> floor, suite 207	None Detected
	SCT-5-19	Ceiling Tile	3 <sup>rd</sup> floor, hall floor	None Detected



Sample Identification		Material Type	Sample Location	Asbestos Content
<b>294 Main Street – Figure 7</b>				
Terraprobe Inc. (2019)	<b>SCT-6-19</b>	Ceiling Tile	4 <sup>th</sup> floor, hall floor	None Detected

Based on the laboratory results, a total of fourteen (14) varieties of asbestos-containing material (ACM) were confirmed to be present at the Property. Photographs of these materials are provided in Appendix B.

### 3.2 Lead

Lead and lead products were once common in construction materials until amendments prohibited the use of lead as a constituent in most construction and consumer products. Historically, lead was a component of many common building materials including paint, water supply, drain piping and electrical equipment.

All visible building drains and pipes were noted to be of a material other than lead and no samples were collected for any drains or pipes. Other elemental lead materials were not directly observed.

Under the *Surface Coatings Materials Regulations*, paint containing lead content greater than 0.009% (90 ug/g or 90 ppm) is considered to be lead-based. All paint types encountered during the inspection were sampled and submitted to AGAT Laboratories for analysis.

Forty-four (44) paint varieties were sampled for lead at the Property. One representative sample was obtained from each location and submitted to AGAT Laboratories for analysis. Appendix A presents the Certificates of Analysis (CoA). The sampling locations can be found in Figures 3 to 7 ‘*Sample Location Plan*’.



The lead (Pb) samples obtained at the Property are as follows:

Sample Identification		Colour	Sample Location	Lead Content
<b>276 Main Street – Figure 3</b>				
<b>Terraprobe Inc. (2019)</b>	<b>Pb-16-19</b>	Light brown	Basement	<10 ug/g
	<b>Pb-17-19</b>	Yellow	Basement	<10 ug/g
	<b>Pb-18-19</b>	White	1st floor	<10 ug/g
	<b>Pb-19-19</b>	White	1st floor, west room	<10 ug/g
	<b>Pb-20-19</b>	White	2nd floor	<10 ug/g
	<b>Pb-21-19</b>	Off white	2nd floor, suite 202, west wall	<10 ug/g
	<b>Pb-22-19</b>	White	2 <sup>nd</sup> floor ceiling	<b>216 ug/g</b>
	<b>Pb-23-19</b>	Off white	2 <sup>nd</sup> floor, exterior wall	16 ug/g
<b>286 Main Street – Figure 4</b>				
<b>Terraprobe Inc. (2019)</b>	<b>Pb-11-19</b>	Off white over green	Basement wall	<b>3,430 ug/g</b>
	<b>Pb-12-19</b>	Light purple	1st floor, back room	<b>5,360 ug/g</b>
<b>288 - 290 Main Street – Figure 5</b>				
<b>Terraprobe Inc. (2017)</b>	<b>PB-20</b>	Yellow	main room in basement	<b>1,590 ug/g</b>
	<b>PB-21</b>	Beige	1 <sup>st</sup> floor, main room	<b>1,760 ug/g</b>
<b>Terraprobe Inc. (2019)</b>	<b>Pb-9-19</b>	Red	1st floor, floor	66 ug/g
	<b>Pb-10-19</b>	White	1st floor	<b>1,330 ug/g</b>
	<b>Pb-13-19</b>	Off white	2 <sup>nd</sup> floor, hallway	<10 ug/g



Sample Identification	Colour	Sample Location	Lead Content	
<b>292 Main Street – Figure 6</b>				
<b>Terraprobe Inc. (2017)</b>	<b>PB-15</b>	Off white	1 <sup>st</sup> floor, near stairwell to 2 <sup>nd</sup> floor	16 ug/g
	<b>PB-16</b>	Yellow	1 <sup>st</sup> floor, across from washroom	<b>7,560 ug/g</b>
	<b>PB-17</b>	Beige	building exterior (northeast corner)	<b>23,600 ug/g</b>
	<b>PB-18</b>	White over green	main room in basement	<b>1,030 ug/g</b>
	<b>PB-19</b>	Green	garage exterior	<b>64,300 ug/g</b>
<b>Terraprobe Inc. (2019)</b>	<b>Pb-6-19</b>	Off white	2nd floor	<b>3,040 ug/g</b>
	<b>Pb-7-19</b>	Brown	Basement, staircase	<b>65,700 ug/g</b>
	<b>Pb-8-19</b>	White over yellow	1st floor, entrance foyer	27 ug/g
<b>294 Main Street – Figure 7</b>				
<b>Terraprobe Inc. (2017)</b>	<b>PB-1</b>	White	Basement utility room	<10 ug/g
	<b>PB-2</b>	White	1 <sup>st</sup> floor, suite 102	<10 ug/g
	<b>PB-3</b>	Teal blue	5 <sup>th</sup> floor, vacant suite	18 ug/g
	<b>PB-4</b>	Teal blue	5 <sup>th</sup> floor, suite 507	<b>542 ug/g</b>
	<b>PB-5</b>	Beige	4 <sup>th</sup> floor, exterior hallway at suite 401	<10 ug/g
	<b>PB-6</b>	Beige	4 <sup>th</sup> floor, suite 407	<10 ug/g
	<b>PB-7</b>	Yellow / beige	3 <sup>rd</sup> floor, suite 301	<10 ug/g
	<b>PB-8</b>	White	3 <sup>rd</sup> floor, suite 305	<10 ug/g
	<b>PB-9</b>	Off white	3 <sup>rd</sup> floor, suite 305	<10 ug/g
	<b>PB-10</b>	Blue/grey	3 <sup>rd</sup> floor, stairwell by washroom	<b>160 ug/g</b>
	<b>PB-11</b>	Light pink	2 <sup>nd</sup> floor, suite 205	11 ug/g



Sample Identification		Colour	Sample Location	Lead Content
<b>294 Main Street – Figure 7</b>				
<b>Terraprobe Inc. (2017)</b>	<b>PB-12</b>	Blue / grey	1 <sup>st</sup> floor, suite 101	17 ug/g
	<b>PB-13</b>	Yellow	1 <sup>st</sup> floor, suite 103	<10 ug/g
	<b>PB-14</b>	Beige	main floor, Optimart, near front window	<10 ug/g
<b>Terraprobe Inc. (2019)</b>	<b>Pb-1-19</b>	Beige	1st floor, back office of Pharmacy	18 ug/g
	<b>Pb-2-19</b>	Blue	2nd floor, suite 201, trim	<10 ug/g
	<b>Pb-3-19</b>	Blue / grey	3rd floor, staircase	<10 ug/g
	<b>Pb-4-19</b>	Light blue	4th floor, suite 401	<10 ug/g
	<b>Pb-5-19</b>	Off white	5th floor, men's washroom	10 ug/g

Based on the analytical results from the CoA, fourteen (14) paint samples exceeded the guideline for lead (>90 µg/g) and are considered to be lead-based paints. The table below provides the lead exceedance found at the Property:

Sample Identification	Colour	Sample Location	Lead Content
<b>276 Main Street – Figure 3</b>			
<b>Pb-22-19</b>	White	2 <sup>nd</sup> floor ceiling	<b>216 ug/g</b>
<b>286 Main Street – Figure 4</b>			
<b>Pb-11-19</b>	Off white over green	Basement wall	<b>3,430 ug/g</b>
<b>Pb-12-19</b>	Light purple	1st floor, main floor	<b>5,360 ug/g</b>
<b>288 - 290 Main Street – Figure 5</b>			
<b>PB-20</b>	Yellow	main room in basement	<b>1,590 ug/g</b>
<b>PB-21</b>	Beige	1 <sup>st</sup> floor, main room	<b>1,760 ug/g</b>
<b>Pb-10-19</b>	White	1st floor	<b>1,330 ug/g</b>



Sample Identification	Colour	Sample Location	Lead Content
<b>292 Main Street – Figure 6</b>			
<b>PB-16</b>	Yellow	1 <sup>st</sup> floor, across from washroom	<b>7,560 ug/g</b>
<b>PB-17</b>	Beige	building exterior (northeast corner)	<b>23,600 ug/g</b>
<b>PB-18</b>	White over green	main room in basement	<b>1,030 ug/g</b>
<b>PB-19</b>	Green	Garage, exterior	<b>64,300 ug/g</b>
<b>Pb-6-19</b>	Off white	2 <sup>nd</sup> floor	<b>3,040 ug/g</b>
<b>Pb-7-19</b>	Brown	Basement	<b>65,700 ug/g</b>
<b>294 Main Street – Figure 7</b>			
<b>PB-4</b>	Teal blue	5 <sup>th</sup> floor, suite 507	<b>542 ug/g</b>
<b>PB-10</b>	Blue/grey	3 <sup>rd</sup> floor, stairwell by washroom	<b>160 ug/g</b>

In summary one (1) paint sample at 276 Main Street, two (2) paint samples at 286 Main Street, three (3) paint samples at 288 – 290 Main Street, six (6) paint samples at 292 Main Street and two (2) paint samples at 294 Main Street were confirmed to contain lead at levels above the Federal government Hazardous Products Act Guidelines (i.e. greater than 90 ppm). Photographs of the lead-containing paints are provided in Appendix B.

### 3.3 Polychlorinated Biphenyls (PCB)

Polychlorinated Biphenyls (PCB's) are typically found in electrical equipment containing insulating fluids or pastes. Ontario Regulation 362 requires that PCB wastes be stored in a secure registered storage facility on site, or on another site of the same owner pending destruction at an approved facility. A material is defined as a PCB waste when it contains PCB in excess of 50 parts per million (ppm). Electrical equipment containing liquids or compounds which contain PCB's in excess of 50 ppm is also considered a PCB waste.

Ballasts used in fluorescent fixtures manufactured prior to 1978 may contain PCB pastes. Given that the average ballast is replaced every 10-15 years, it is unlikely that any PCB-containing ballasts remain on the property. To confirm this, an examination of selected light ballasts was conducted. No PCB-containing



ballasts were identified. However, the potential that some other PCB-containing ballasts may still be present cannot be completely eliminated.

No other electrical fixtures that are suspected to contain PCB fluids or pastes were observed in the buildings.

### **3.4 Mercury**

There were no older thermostat units or other potential sources of mercury observed in the structures. If encountered, these items should be removed intact prior to any renovation or demolition activities.

### **3.5 Silica**

The concrete and brick in the building could contain silica in some quantity within the matrix of the components. No other silica was identified at the Property.

### **3.6 Ozone Depleting Substances**

Ontario Regulation 189/94 governs the discharge of chlorinated fluorocarbon (CFC) refrigerants into the environment. The release of CFC containing refrigerants to the atmosphere is not allowed.

HVAC units at 276 Main Street contain R-22 which is an ozone depleting substance. An additional HVAC unit was noted at 294 Main Street which has the potential to contain R-22 refrigerants. No other sources of ozone depleting substances were identified at the Property.

### **3.7 Other Designated Substances**

There is no reason to suspect that the following substances are present in the construction materials of the building in sufficient quantities to exceed the Ministry of Labour exposure limits:

- Vinyl Chloride (could be present in paints, plastics, etc.)
- Coke Oven Emissions
- Isocyanates (could be present in paints, plastics, etc.)
- Arsenic
- Ethylene Oxide
- Acrylonitrile (could be present in plastics)

## **4.0 CONCLUSIONS AND RECOMMENDATIONS**

Based on the results of the Terraprobe Inc. and SafeTech Environmental Inc. site inspections and laboratory analyses, the following designated substances have been confirmed to be present on the Property:



## 4.1 Asbestos

The following types of asbestos-containing material were confirmed to be present at the site:

- 276 Main Street
  - The light brown vinyl floor tiles in Studio A contain 2% chrysotile asbestos.
  - The light brown vinyl floor tiles on the first floor contain 0.5% - 5% chrysotile asbestos.
- 286 Main Street
  - No asbestos-containing material was confirmed to be present.
- 288 – 290 Main Street
  - The insulation on the pipes in the basement contains more than 75% chrysotile asbestos.
  - The window caulking material used on the exterior windows contains 0.5-5% chrysotile asbestos.
- 292 Main Street
  - The white stucco coating on the basement walls contains 0.5-5% chrysotile asbestos.
- 294 Main Street
  - The white acoustic ceiling tiles located in the basement utility room, in the Pharmacy, in suite 301, in suite 501b and in the vacant suite on the 5<sup>th</sup> floor all contain 0.5-5% amosite asbestos.
  - The white vinyl floor tiles in suite 102 and the off-white vinyl floor tiles in suite 305 both contain 0.5-5% chrysotile asbestos.

The stucco coating on the basement walls at 292 Main Street is considered to be friable ACM. For friable asbestos materials, Type 3 Removal procedures must be followed, including the use of a sealed polyethylene enclosure with negative air pressure. Protective clothing (i.e., tyvek suits) and full-face respirators are mandatory.

Similarly, for the pipe insulation at 288 - 290 Main Street, Type 3 Removal Procedures must be followed, including the use of a sealed polyethylene enclosure with negative air pressure. Protective clothing (i.e., tyvek suits) and full-face respirators are mandatory. Or, depending on the accessibility of the pipes, the pipe insulation can be removed using a glove bag and Type 2 Removal Procedures.

Type 3 Removal Procedures are also recommended for the ceiling tiles found at 294 Main Street. It is noted that these ceiling tiles contain amosite asbestos, which is generally considered to be more harmful than chrysotile asbestos.

The window caulking and vinyl floor tiles at the Property are considered non-friable ACM. The removal of the non-friable ACM will require either Type 1 or Type 2 procedures, depending on the expected work



methods. For example, if the caulking is wetted to control dust and the work is done using only non-powered, hand-held tools, then Type 1 Removal precautions are required under O.Reg. 278/05. If it is not wetted, but the work is done using either non-powered, hand held tools or power tools equipped with HEPA filters, Type 2 Removal precautions are required.

Further information regarding each removal procedure is provided in Ontario Regulation 278/05 (Appendix B).

## 4.2 Lead-based Paint

Fourteen (14) of the paint samples tested have been confirmed to contain lead at levels which are above the current Ministry of Labour guideline, as noted in Section 3.2. If the paint is to be removed or disturbed, worker protective measures will be required. The Ministry of Labour *Guideline - Lead on Construction Projects (2004)* should be consulted directly prior to the disturbance of this material. A copy of this guideline is provided in Appendix C. However, for preliminary planning purposes, the following information is provided:

- If the paint is to be removed prior to building demolition by scraping or sanding with non-powered tools, the work is considered a “Type 2a” Operation, and protective clothing is required, including coveralls or full-body work clothing, gloves, hats and safety glasses. A half-mask particulate respirator with N-, R-, or P-series filter is also required.
- If the building is to be demolished, or the paint is to be removed using power tools without HEPA filters, then the work is considered a “Type 3a” Operation. The above-noted protective clothing will be required, as well as a full-facepiece respirator and N-, R-, or P-series filters.

In addition to the information provide above, the possibility is recognized that the following designated substances may be present at the site:

## 4.3 Silica

It is possible that silica is present in the concrete or bricks of the building. O.Reg. 845/90 outlines the required precautions for worker protection during demolition activities, which include a minimum of wetting the materials before and during work, and performing air quality testing during the work to ensure the levels of airborne silica do not exceed the NIOSH guidelines. Workers would need to wear protective gear during the work if airborne levels of silica exceed the NIOSH guidelines.

For a complete outline of the requirements for worker protection in relation to the specific workplan involved at the site, the contractor should consult O.Reg. 845/90 directly, once their workplan has been developed.



#### **4.4 PCB-Containing Equipment**

Wherever possible, light ballasts in the buildings were inspected to determine if they contained PCB. All of the ballasts that were inspected were marked as “non-PCB”. However, the possibility is recognized that some may remain in the building.

In the event that a large amount of PCB containing ballasts are encountered during renovations, special handling and disposal practices will be required. The PCB status of each ballast can be determined at the time of removal.

#### **4.5 Ozone Depleting Substances**

Ontario Regulation 189/94 governs the discharge of chlorinated fluorocarbon (CFC) refrigerants into the environment. The release of CFC containing refrigerants to the atmosphere is not allowed.

There HVAC units at 276 Main Street contain ozone depleting substances (R-22) and the HVAC unit at 294 Main Street potentially contains ozone depleting substances. Any HVAC units utilizing CFC refrigerants require special handling and disposal to meet the requirements of O. Reg 189/94.

No other evidence of designated substances was encountered at the site.



## 5.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Tribute (Danforth) Ltd., and is intended to provide an assessment of the condition and quantity of materials listed by the Occupational Health and Safety Act of Ontario as designated substances on the property located at 276 to 294 Main Street, Toronto, Ontario.

Any use which a third party makes of this report, or any reliance on or decisions to be made based upon it, are the sole responsibility of such third parties. Terraprobe Inc. accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions taken based on this report, including, consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

This assessment is not to be considered a definitive assessment of the building components, that eliminates all risks of encountering environmental problems associated with designated or other substances at the subject property. The information presented in this report is based on information collected by Terraprobe Inc. It is reported based on visible features but there are portions of the structure that are not available for direct observation at this time.

In assessing the condition and extent of designated substances in the structure, Terraprobe may rely in good faith on information provided by others, and it is assumed that the information provided is factual and accurate. Terraprobe accepts no responsibility for any deficiency, misstatement or inaccuracy in this report resulting from the information provided by others.

There is no warranty expressed or implied by this report regarding the condition of the subject property. Professional judgement was exercised in gathering and analyzing information collected by our staff, as well as that submitted by others. The conclusions presented are the product of professional care and competence, and cannot be construed as an absolute guarantee.

The recommendations made in this report for the handling and/or removal of hazardous materials are general in nature only. Prior to work with any hazardous materials, the applicable regulation(s) should be reviewed in detail by the contractor to confirm appropriate procedures.

In the event that work on the structures reveals previously hidden building components and new information regarding the composition of the subject building is available, Terraprobe Inc. should be notified in order that we may re-evaluate the findings of this assessment and provide amendments, as required.



## 6.0 SIGNATURES

We trust this report meets with your requirements. Should you have any questions regarding the information presented, please do not hesitate to contact our office.

Yours truly,

**Terraprobe Inc.**



Shelby Plant, B.Sc.E., E.I.T.  
Project Manager

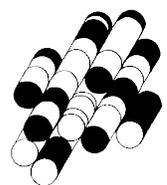


R. Baker Wohayeb, M.A.Sc., P.Eng., QPRA.  
Principal



# FIGURES

**TERRAPROBE INC.**

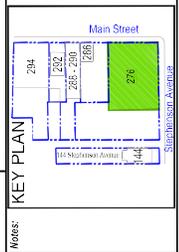








Reference:



- Legend:
- ▲ Sample Location
  - ▲ Lead Sample
  - ▲ Joint Compound Sample
  - ▲ Suspended Ceiling Tile Sample
  - ▲ Asbestos Sample
  - ▲ Floor Tile Sample
  - ▲ Sample Exceeds Guideline Limits
  - ▲ Sample Meets Guideline Limits

Project Title:

Designated Substance Survey

Site Location:

276 Main Street, Toronto

Figure Title:

SAMPLE LOCATION PLAN

Designed By:

SP

File No.:

1-17-005-46.2

Drawn By:

MV

Scale:

NTS

Reviewed By:

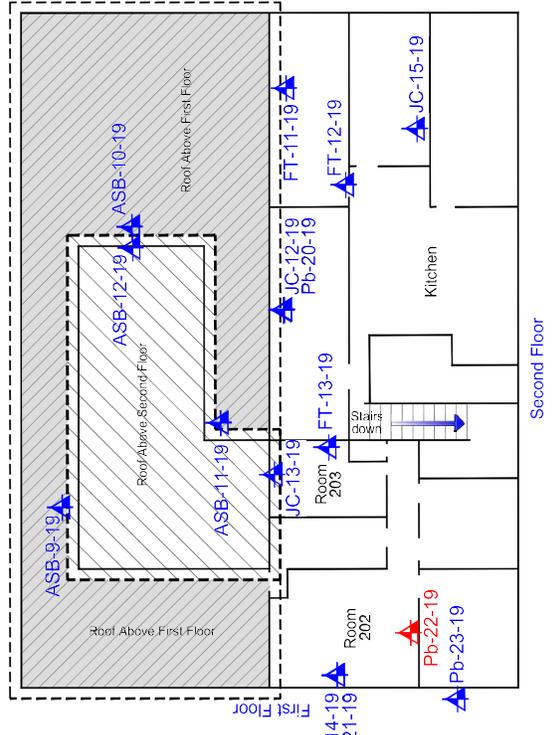
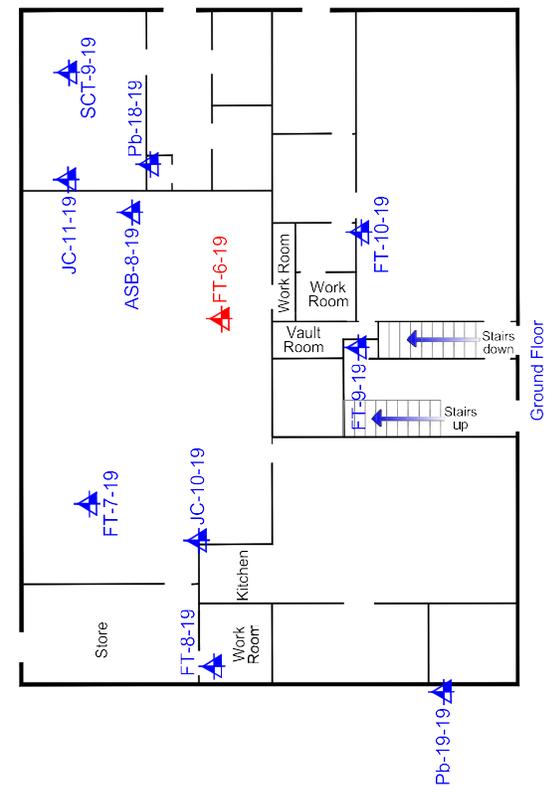
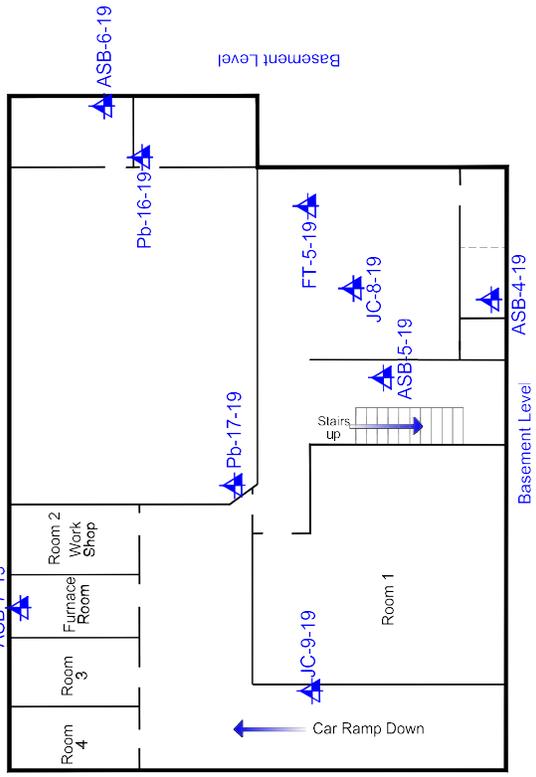
BW

Figure No.:

3

Date:

November 2019



Main Street

Stephenson Avenue



Reference:

Notes: KEY PLAN



Legend:

- ▲ Sample Location
- ▲ Lead Sample
- ▲ Floor Tile Sample
- ▲ Suspended Ceiling Tile Sample
- ▲ Asbestos Sample
- ▲ Sample Excavates Guideline Limits
- ▲ Sample Meets Guideline Limits

Project Title:

Designated Substance Survey

Site Location:

286 Main Street, Toronto

Figure Title:

SAMPLE LOCATION PLAN

Designed By:

SP

File No.:

1-17-005-46.2

Drawn By:

MV

Scale:

NTS

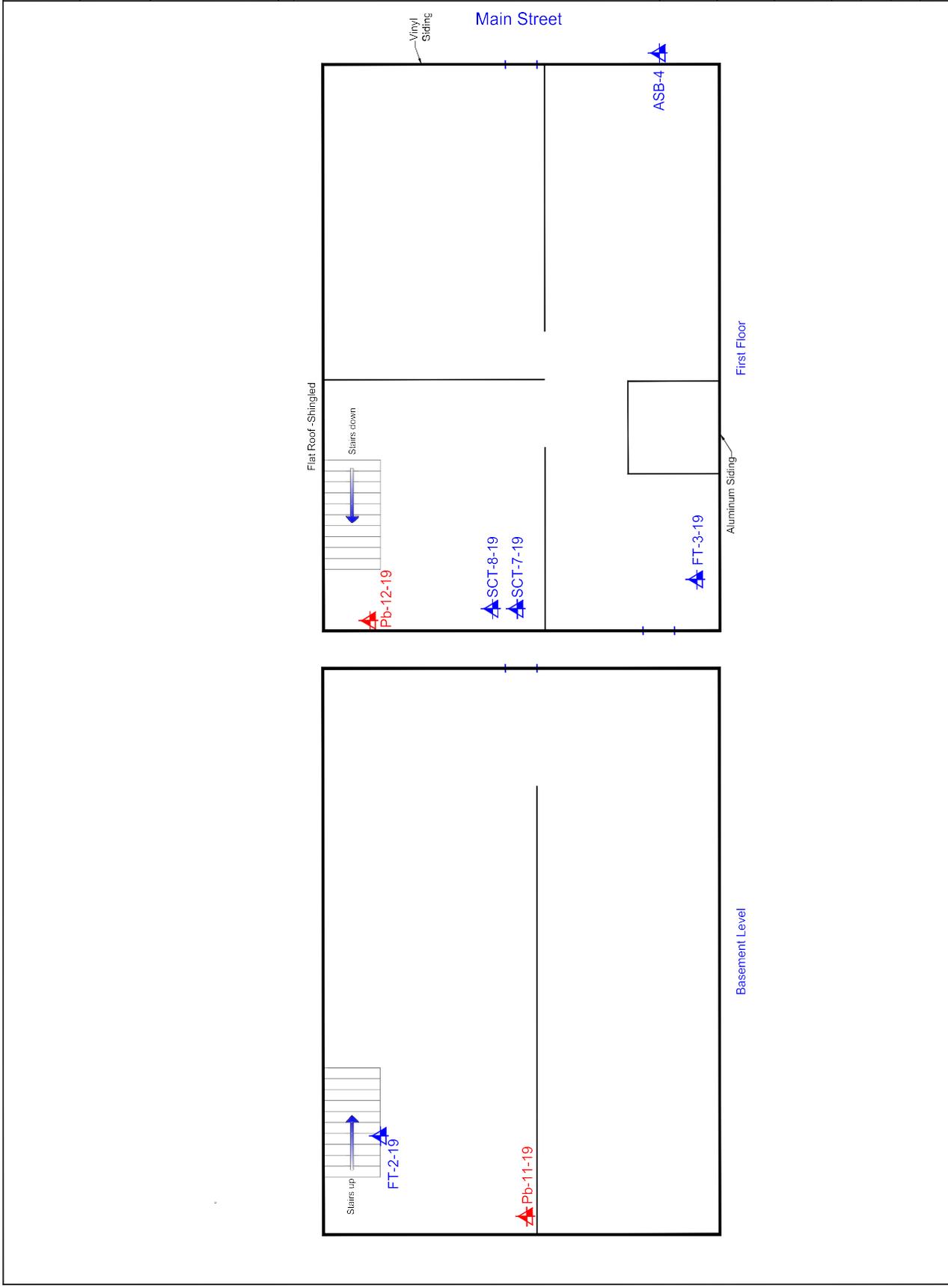
Reviewed By:

BW

Figure No.:

4

Date: November 2019









Legend:

- ▲ Sample Location
- ▲ Lead Sample
- ▲ Joint Compound Sample
- ▲ Floor Tile Sample
- ▲ Asbestos Sample
- ▲ Suspended Ceiling Tile Sample
- ▲ Sample Exceeds Guideline Limits
- ▲ Sample Meets Guideline Limits

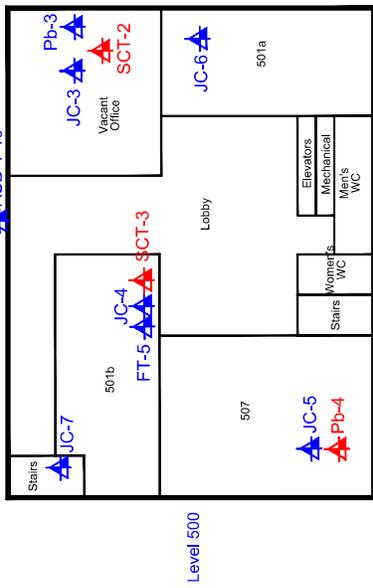
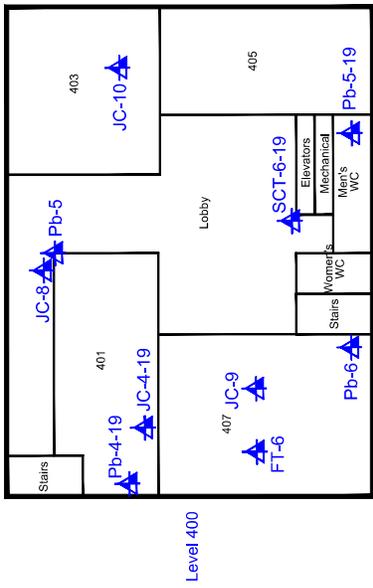
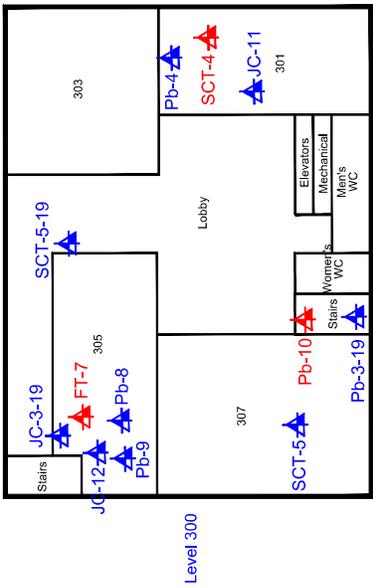
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Site Location: 294 Main Street, Toronto

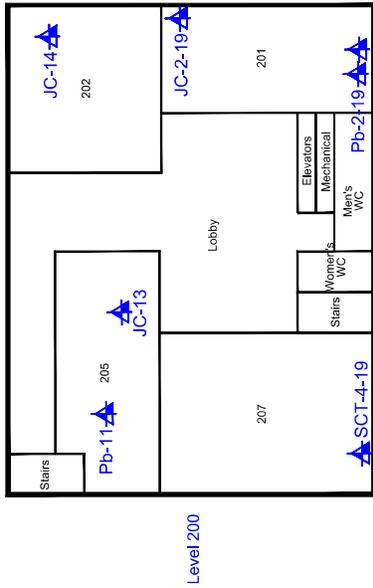
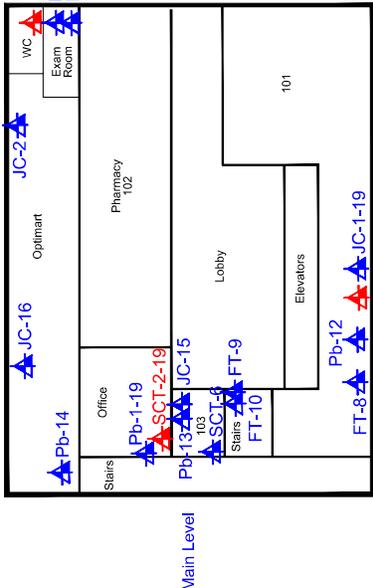
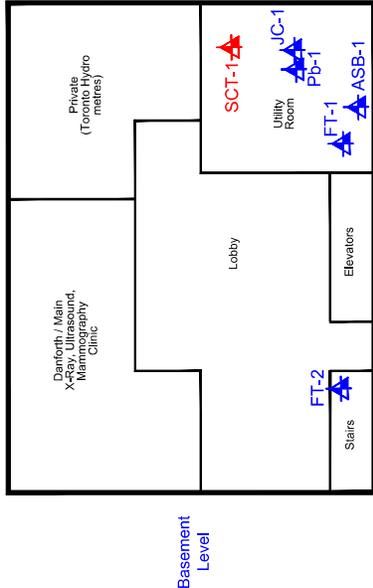
Figure Title: SAMPLE LOCATION PLAN

Designed By:	SP	File No.:	1-17-005-46.2
Drawn By:	MV	Scale:	NTS
Reviewed By:	BW	Figure No.:	7
Date:	November 2019		

Main Street

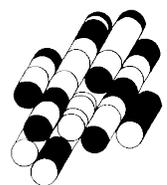


Main Street



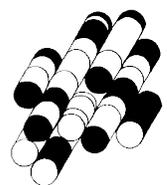
# APPENDICES

**TERRAPROBE INC.**



# APPENDIX A

**TERRAPROBE INC.**



CLIENT NAME: TERRAPROBE INC.  
11 INDELL LANE  
BRAMPTON, ON L6T3Y3  
(905) 796-2650

ATTENTION TO: Shelby Plant

PROJECT: Main & Danforth

AGAT WORK ORDER: 19T529228

ASBESTOS REVIEWED BY: Ian Seddon, Analyst

OCCUPATIONAL HYGIENE REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Oct 16, 2019

PAGES (INCLUDING COVER): 15

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 19T529228

PROJECT: Main & Danforth

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: TERRAPROBE INC.

SAMPLING SITE:

ATTENTION TO: Shelby Plant

SAMPLED BY:

DATE RECEIVED: 2019-10-10		DATE REPORTED: 2019-10-16									
<b>Bulk Asbestos</b>											
Asbestos (Bulk)	Unit %	SAMPLE DESCRIPTION: ASB-1-19a Solid		ASB-1-19c	ASB-2-19a	ASB-2-19b	ASB-2-19c	ASB-3-19a	ASB-3-19b	ASB-3-19c	ASB-3-19d
		0.5	0.5	ND	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07
		RDL	607683	607687	607688	607689	607690	607691	607692	607693	607694
Asbestos (Bulk)	Unit %	SAMPLE DESCRIPTION: ASB-3-19c Solid		ASB-5-19b	ASB-5-19c	ASB-6-19a	ASB-6-19b	ASB-6-19c	ASB-7-19a	ASB-7-19b	ASB-7-19c
		0.5	0.5	ND	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07
		RDL	607693	607698	607699	607700	607701	607702	607703	607704	607705
Asbestos (Bulk)	Unit %	SAMPLE DESCRIPTION: ASB-7-19b Solid		ASB-8-19a	ASB-8-19b	ASB-8-19c	ASB-9-19a	ASB-9-19b	ASB-9-19c	ASB-9-19d	ASB-9-19e
		0.5	0.5	ND	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07
		RDL	607704	607706	607707	607708	607709	607710	607711	607712	607713
Asbestos (Bulk)	Unit %	SAMPLE DESCRIPTION: ASB-10-19a Solid		ASB-10-19b	ASB-10-19c	ASB-11-19a	ASB-11-19b	ASB-11-19c	ASB-12-19a	ASB-12-19b	ASB-12-19c
		0.5	0.5	ND	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07
		RDL	607712	607714	607715	607716	607717	607718	607719	607720	607721
Asbestos (Bulk)	Unit %	SAMPLE DESCRIPTION: ASB-12-19c Solid		JC-1-19	JC-2-19	JC-3-19	JC-4-19	JC-5-19	JC-6-19	JC-8-19	JC-9-19
		0.5	0.5	ND	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07
		RDL	607720	607722	607723	607724	607725	607726	607727	607728	607729
Asbestos (Bulk)	Unit %	SAMPLE DESCRIPTION: ASB-12-19c Solid		JC-1-19	JC-2-19	JC-3-19	JC-4-19	JC-5-19	JC-6-19	JC-8-19	JC-9-19
		0.5	0.5	ND	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07
		RDL	607720	607722	607723	607724	607725	607726	607727	607728	607729

Certified By:





# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 19T529228

PROJECT: Main & Danforth

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.  
SAMPLING SITE:

ATTENTION TO: Shelby Plant  
SAMPLED BY:

DATE RECEIVED: 2019-10-10		DATE REPORTED: 2019-10-16	
<b>Bulk Asbestos</b>			
SAMPLE DESCRIPTION: FT-13-19a			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: FT-13-19b			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: FT-13-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-2-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-2-19a			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-3-19a			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-3-19b			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-3-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-4-19a			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-4-19b			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-4-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-5-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-5-19b			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-6-19a			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-6-19b			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-6-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-7-19a			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-7-19b			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-7-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-8-19a			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-8-19b			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-8-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-9-19a			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-9-19b			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5
SAMPLE DESCRIPTION: SCT-9-19c			
SAMPLE TYPE: Solid			
DATE SAMPLED: 2019-10-07			
Parameter	Unit	G / S	RDL
Asbestos (Bulk)	%	0.5	0.5

Certified By: 



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 19T529228

PROJECT: Main & Danforth

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.

SAMPLING SITE:

ATTENTION TO: Shelby Plant

SAMPLED BY:

Bulk Asbestos	DATE REPORTED: 2019-10-16
---------------	---------------------------

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard; Refers to ON OHSA - Reg. 278

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

As per Reg 278/05 and AGAT SOP, all non-detect results have been analyzed and confirmed three times.

607785 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos present - Chrysotile

607786-607787 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"SP" - Stop Positive

607788-607808 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

As per Reg 278/05 and AGAT SOP, all non-detect results have been analyzed and confirmed three times.

607827 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos present - Amosite

607828-607829 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"SP" - Stop Positive

607830 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos present - Amosite

607831-607832 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"SP" - Stop Positive

607833-607854 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

As per Reg 278/05 and AGAT SOP, all non-detect results have been analyzed and confirmed three times.

Analysis performed at AGAT Toronto (unless marked by \*)

Certified By:



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 19T529228

PROJECT: Main & Danforth

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.

SAMPLING SITE:

ATTENTION TO: Shelby Plant

SAMPLED BY:

DATE RECEIVED: 2019-10-10		DATE REPORTED: 2019-10-16	
<b>Bulk Asbestos</b>			
SAMPLE DESCRIPTION: ASB-4-19a ASB-4-19b ASB-4-19c FT-2-19a FT-2-19b FT-2-19c			
SAMPLE TYPE: Solid Solid Solid Solid Solid Solid			
DATE SAMPLED: 2019-10-07 2019-10-07 2019-10-07 2019-10-07 2019-10-07 2019-10-07			
G / S RDL 607694 607695 607696 607773 607774 607775			
Parameter	Unit		
Asbestos (Bulk) Phase 1	%	0.5	0.5
Asbestos (Bulk) Phase 2	%	0.5	0.5
		ND	ND

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard; Refers to ON OHSA - Reg. 278

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

607694-607696 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected  
Phase 1 - Drywall Phase 2 - Plaster

As per Reg 278/05 and AGAT SOP, all non-detect results have been analyzed and confirmed three times.

607773-607775 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected  
Phase 1 - Beige Phase 2 - Green

As per Reg 278/05 and AGAT SOP, all non-detect results have been analyzed and confirmed three times.

Analysis performed at AGAT Toronto (unless marked by \*)

Certified By:



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 19T529228

PROJECT: Main & Danforth

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.

SAMPLING SITE:

ATTENTION TO: Shelby Plant

SAMPLED BY:

DATE RECEIVED: 2019-10-10		DATE REPORTED: 2019-10-16									
<b>Lead in Paint</b>											
Parameter	Unit	SAMPLE DESCRIPTION:		Pb-16-19	Pb-17-19	Pb-18-19	Pb-19-19	Pb-20-19	Pb-21-19	Pb-22-19	Pb-23-19
	µg/g	10	Paint	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	Paint
		RDL	607736	607740	607741	607742	607743	607744	607745	607746	
			<10	<10	<10	<10	<10	<10	<10	261	16
Parameter	Unit	SAMPLE DESCRIPTION:		Pb-1-19	Pb-2-19	Pb-3-19	Pb-4-19	Pb-5-19	Pb-6-19	Pb-7-19	Pb-8-19
	µg/g	18	Paint	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07	Paint
		RDL	607747	607748	607749	607750	607751	607752	607753	607754	
			<10	<10	<10	<10	<10	10	3040	65700	27
Parameter	Unit	SAMPLE DESCRIPTION:		Pb-9-19	Pb-10-19	Pb-11-19	Pb-12-19	Pb-13-19			
	µg/g	66	Paint	2019-10-07	2019-10-07	2019-10-07	2019-10-07	2019-10-07			
		RDL	607755	607756	607757	607758	607759	<10			
			<10	1330	3430	5360					

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard  
Analysis performed at AGAT Toronto (unless marked by \*)

*Shelby Basily*

**Certified By:**

## Quality Assurance

CLIENT NAME: TERRAPROBE INC.  
 PROJECT: Main & Danforth  
 SAMPLING SITE:

AGAT WORK ORDER: 19T529228  
 ATTENTION TO: Shelby Plant  
 SAMPLED BY:

### Occupational Hygiene Analysis

RPT Date: Oct 16, 2019			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	

Lead in Paint															
Lead	607749	607749	<10	<10	NA	< 10	103%	80%	120%	104%	80%	120%	102%	70%	130%
Lead in Paint															
Lead	607205		742	821	10.1%	< 10	106%	80%	120%	115%	80%	120%	109%	70%	130%

Comments: NA signifies Not Applicable.  
 Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: \_\_\_\_\_

Divine Basily

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

## Method Summary

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 19T529228

PROJECT: Main & Danforth

ATTENTION TO: Shelby Plant

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Asbestos (Bulk)	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM
Asbestos (Bulk) Phase 1	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM
Asbestos (Bulk) Phase 2	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM
Occupational Hygiene Analysis			
Lead	MET-93-6106	EPA SW 846 3050B & 6010C	ICP/OES







AGAT Laboratories

### CHAIN OF CUSTODY RECORD

#### Client Information

Company: Terraprobe Inc.  
 Contact: Shelby Plant  
 Address: Sampton, ON  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Project: Main & Dundas PO: 1-17-0005-48.2

AGAT Quotation #: \_\_\_\_\_  
 Please note, if quotation number is not provided, client will be billed full price for analysis.

#### Invoice To Same as Above? Yes/No (circle)

Company: \_\_\_\_\_  
 Contact: rossi@terraprobe.ca  
 Address: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

5835 Coopers Avenue  
 Mississauga, Ontario; L4Z 1Y2  
 Phone: 905-712-5100; Fax: 905-712-5122  
 Toll free: 800-856-6261  
 www.agatlabs.com  
 http://webearth.agatlabs.com

#### LABORATORY USE ONLY

Arrival Condition:  Good  Poor (complete "notes")  
 Arrival Temperature: \_\_\_\_\_ AGAT WO #: \_\_\_\_\_  
 Notes: \_\_\_\_\_

#### Report Information - reports to be sent to:

1. Name: Shelby Plant  
 Email: splant@terraprobe.ca  
 2. Name: \_\_\_\_\_  
 Email: \_\_\_\_\_

#### Regulatory Requirements

Regulation 153 Table (Indicate one)  
 Sewer Use Region (Indicate one)  
 Regulation 558 CCME Other (indicate)  
 Ind/Com Res/Park Agriculture  
 Sanitary Storm  
 Soil Texture (check one)  
 Coarse  Med/Fine  
 Prov. Water Quality Objectives (PWQO)  
 Nutrient Management Act (NMA)

Is this a drinking water sample (potable water intended for human consumption)?  
 Yes  No (If "Yes" please use the Drinking Water Chain of Custody Record)

#### Turnaround Time (TAT) Required\*

Regular TAT:  5 to 7 Working Days  
 Rush TAT: (please provide prior notification)  
 Rush Surcharges Apply  
 3 to 5 Working Days  
 2 Working Days  
 1 Working Day  
**OR**  
 DATE REQUIRED (Rush surcharges may apply): \_\_\_\_\_  
 \*TAT is exclusive of weekends and statutory holidays

#### Report Format

Single Sample per page  
 Multiple Samples per page  
 Results by fax

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Site/ Sample Information	Comments	Metals and Inorganics	Metal Scan (excl. Hg, As, Cr)	CMC Fractions 1 to 4	VOCs	PAHs	PCBs	TCLP Metals/Inorganics	TCLP	Storm Sewer Use	Sanitary Sewer Use	LABORATORY USE ONLY	LAB SAMPLE ID
Pb-16-19	07/2/19		P	1														
Pb-17-19			P	1														
Pb-18-19			P	1														
Pb-19-19			P	1														
Pb-20-19			P	1														
Pb-21-19			P	1														
Pb-22-19			P	1														
Pb-23-19			P	1														
Samples Relinquished By (print name & sign)							Date/Time	Samples Received By (print name & sign)		Date/Time	Date/Time		Date/Time		Pink Copy - Client		PAGE 3 of 6	
Shelby Plant							10/08/19	[Signature]		20/9/2010	1-10		1-10		Yellow + Golden Copy - AGAT		NO:	
[Signature]							20/19/10/10	[Signature]		1-30	1-30		1-30		White Copy - AGAT			



# CHAIN OF CUSTODY RECORD

**Client Information**

Company: Terraprobe Inc.  
 Contact: Shelby Plant  
 Address: Brampton ON.

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Project: Main St Don Mills PO: H-005-482  
 AGAT Quotation #: \_\_\_\_\_

Please note, if quotation number is not provided, client will be billed full price for analysis.

**Invoice To** Same as Above? Yes/No (circle)

Company: \_\_\_\_\_  
 Contact: Arossi@terraprobe.ca  
 Address: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

**LABORATORY USE ONLY**

Arrival Condition:  Good  Poor (complete "notes")  
 Arrival Temperature: \_\_\_\_\_ AGAT WO #: \_\_\_\_\_  
 Notes: \_\_\_\_\_

**Report Information** - reports to be sent to:

1. Name: Shelby Plant  
 Email: splant@terraprobe.ca  
 2. Name: \_\_\_\_\_  
 Email: \_\_\_\_\_

**Regulatory Requirements**

Regulation 153  Sewer Use  Regulation 558  
 Table (Indicate one) Region \_\_\_\_\_  
 Ind/Com  Sanitary  CCME  
 Res/Park  Storm  Other (indicate)  
 Agriculture  
 Soil Texture (check one)  Coarse  Med/Fine  
 Prov. Water Quality Objectives (PWQO)  
 Nutrient Management Act (NMA)

**Report Format**

Single Sample per page  
 Multiple Samples per page  
 Results by fax

**Turnaround Time (TAT) Required\***

**Regular TAT:**  5 to 7 Working Days  
 3 to 5 Working Days  
 2 Working Days  
 1 Working Day

**Rush TAT:** (please provide prior notification)  
 Rush Surcharges Apply  
 3 to 5 Working Days  
 2 Working Days  
 1 Working Day

**OR**

**DATE REQUIRED** (Rush surcharges may apply): \_\_\_\_\_

\*TAT is exclusive of weekends and statutory holidays

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Site/ Sample Information	Comments	Metals and Inorganics	Metal Scan (excl. Hg, B, Cr)	CMF Fractions 1 to 4	VOCs	PAHs	PCBs	TCP Metals/Inorganics	TCP	Storm Sewer Use	Sanitary Sewer Use	LABORATORY USE ONLY	LAB SAMPLE ID
Pb-1-19	02-07-19		P	1														
Pb-2-19	"		P	1														
Pb-3-19	"		P	1														
Pb-4-19	"		P	1														
Pb-5-19	"		P	1														
Pb-6-19	"		P	1														
Pb-7-19	"		P	1														
Pb-8-19	"		P	1														
Pb-9-19	"		P	1														
Pb-10-19	"		P	1														
Pb-11-19	"		P	1														
Pb-12-19	"		P	1														
Pb-13-19	"		P	1														

Samples Relinquished By (print name & sign) \_\_\_\_\_ Date/Time 10/08/19

Samples Relinquished By (print name & sign) Shelby Plant Date/Time 10/08/19

Samples Received By (print name & sign) \_\_\_\_\_ Date/Time 10/09/19

Samples Received By (print name & sign) \_\_\_\_\_ Date/Time 10/09/19

Document ID: DTV-78-1511.004 Date Issued: September 22, 2009

Pink Copy - Client  
 Yellow + Golden Copy - AGAT  
 White Copy - AGAT

PAGE 4 of 6

NO: \_\_\_\_\_





**CLIENT NAME: TERRAPROBE INC.  
11 INDELL LANE  
BRAMPTON, ON L6T3Y3  
(905) 796-2650**

**ATTENTION TO: Suvish Melanta**

**PROJECT: 1-17-0005-48**

**AGAT WORK ORDER: 17T178828**

**ASBESTOS REVIEWED BY: Whenhong Zou, Lab Analyst**

**DATE REPORTED: Jan 23, 2017**

**PAGES (INCLUDING COVER): 6**

**VERSION\*: 1**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

**All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.**

**AGAT** Laboratories (V1)

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)  
Western Enviro-Agricultural Laboratory Association (WEALA)  
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from [www.cala.ca](http://www.cala.ca) and/or [www.scc.ca](http://www.scc.ca). The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 6

*Results relate only to the items tested and to all the items tested  
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request*



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 17T178828

PROJECT: 1-17-0005-48

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.

SAMPLING SITE:

ATTENTION TO: Suvish Melanta

SAMPLED BY: Bob Racher

DATE RECEIVED: 2017-01-17		DATE REPORTED: 2017-01-23					
<b>Bulk Asbestos</b>							
<b>SAMPLE DESCRIPTION: ASB - 1a</b>							
Parameter	Unit	G / S	RDL	ASB - 1b	ASB - 1c	ASB - 3a	ASB - 3b
Asbestos (Bulk)	%	0.5	ND	Other	Other	Other	Other
<b>SAMPLE DESCRIPTION: ASB - 4c</b>							
Parameter	Unit	G / S	RDL	ASB - 5a	ASB - 5b	ASB - 5c	SCT - 1a
Asbestos (Bulk)	%	0.5	ND	Other	Other	Other	Other
<b>SAMPLE DESCRIPTION: SCT - 2b</b>							
Parameter	Unit	G / S	RDL	SCT - 2c	SCT - 3a	SCT - 3b	SCT - 3c
Asbestos (Bulk)	%	0.5	ND	Other	Other	Other	Other
<b>SAMPLE DESCRIPTION: SCT - 5a</b>							
Parameter	Unit	G / S	RDL	SCT - 5b	SCT - 5c	SCT - 6a	SCT - 6b
Asbestos (Bulk)	%	0.5	ND	Other	Other	Other	Other
<b>SAMPLE DESCRIPTION: ASB - 4b</b>							
Parameter	Unit	G / S	RDL	ASB - 4a	ASB - 4c	ASB - 4b	ASB - 4a
Asbestos (Bulk)	%	0.5	ND	Other	Other	Other	Other
<b>SAMPLE DESCRIPTION: SCT - 1b</b>							
Parameter	Unit	G / S	RDL	SCT - 1c	SCT - 2a	SCT - 1c	SCT - 1c
Asbestos (Bulk)	%	0.5	ND	Other	Other	Other	Other

*Wenhong Zou*

Certified By:



**AGAT** Laboratories

# Certificate of Analysis

AGAT WORK ORDER: 17T178828

PROJECT: 1-17-0005-48

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.

SAMPLING SITE:

ATTENTION TO: Suvish Melanta  
SAMPLED BY: Bob Racher

## Bulk Asbestos

DATE RECEIVED: 2017-01-17

DATE REPORTED: 2017-01-23

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8133057-8133068 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

8133069 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Chrysotile

8133070-8133071 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

8133072 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Amosite

8133073-8133074 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

8133075 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Amosite

8133076-8133077 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

8133078 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Amosite

8133079-8133080 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

8133081 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Amosite

8133082-8133083 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

8133084-8133089 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

*Wenhong Zou*

Certified By:



**AGAT** Laboratories

# Certificate of Analysis

AGAT WORK ORDER: 17T178828

PROJECT: 1-17-0005-48

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.

SAMPLING SITE:

ATTENTION TO: Suvish Melanta

SAMPLED BY: Bob Racher

Bulk Asbestos				DATE RECEIVED: 2017-01-17	DATE REPORTED: 2017-01-23	
Parameter	Unit	G / S	RDL	ASB - 2a Other 2017-01-13 8133060	ASB - 2b Other 2017-01-13 8133061	ASB - 2c Other 2017-01-13 8133062
Asbestos (Bulk) Phase 1	%	0.5	0.5-5	ND	SP	SP
Asbestos (Bulk) Phase 2	%	0.5	ND	ND	ND	ND
Asbestos (Bulk) Phase 3	%	0.5	ND	ND	ND	ND

**Comments:** RDL - Reported Detection Limit; G / S - Guideline / Standard

**8133060** Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Chrysotile

"ND" - Not Detected

Phase1: T-coat Phase2: DJC Phase3: Plaster

**8133061-8133062** Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

"ND" - Not Detected

Phase1: T-coat Phase2: DJC Phase3: Plaster

*Wenhong Zou*

Certified By:

## Method Summary

**CLIENT NAME:** TERRAPROBE INC.

**AGAT WORK ORDER:** 17T178828

**PROJECT:** 1-17-0005-48

**ATTENTION TO:** Suvish Melanta

**SAMPLING SITE:**

**SAMPLED BY:** Bob Racher

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Asbestos (Bulk)	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM
Asbestos (Bulk) Phase 1	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM
Asbestos (Bulk) Phase 2	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM
Asbestos (Bulk) Phase 3	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM



# AGAT Laboratories

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph: 905.712.5100 Fax: 905.712.5122  
webearth.agatlabs.com

Laboratory Use Only  
Work Order #: **17TI78828**

Cooler Quantity: \_\_\_\_\_  
Arrival Temperatures: \_\_\_\_\_  
Custody Seal Intact:  Yes  No  N/A  
Notes:

## Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

**Report Information:**  
Company: terraprobe Inc.  
Contact: Suvish Melanta  
Address: Brampton, ON  
Phone: \_\_\_\_\_  
Reports to be sent to: \_\_\_\_\_  
1. Email: smelanta@terraprobe.ca  
2. Email: \_\_\_\_\_

**Project Information:**  
Project: 1-17-0005-48  
Site Location: Main St Toronto  
Sampled By: B. Racher.  
AGAT Quote #: \_\_\_\_\_ PO: \_\_\_\_\_

**Invoice Information:**  
Company: \_\_\_\_\_  
Contact: \_\_\_\_\_  
Address: \_\_\_\_\_  
Email: \_\_\_\_\_  
Bill To Same: Yes  No

**Regulatory Requirements:**  No Regulatory Requirement  
*(Please check all applicable boxes)*  
 Regulation 153/04  
Table indicate One  
 Inq/Com  Sewer Use  Regulation 558  
 Res/Park  Sanitary  CCME  
 Agriculture  Storm  Prov. Water Quality Objectives (PWQO)  
Soil Texture (Check One) indicate One  
 Coarse  Other  
 Fine

**Report Guideline on Certificate of Analysis**  
Is this submission for a Record of Site Condition?  
 Yes  No  No

**Turnaround Time (TAT) Required:**  
Regular TAT  5 to 7 Business Days  
Rush TAT (Rush Surcharges Apply)  
 3 Business Days  2 Business Days  1 Business Day

**OR Date Required (Rush Surcharges May Apply):**  
Please provide prior notification for rush TAT  
\*TAT is exclusive of weekends and statutory holidays

**Sample Matrix Legend**  
B Biota  
GW Ground Water  
O Oil  
P Paint  
S Soil  
SD Sediment  
SW Surface Water

**Field Filtered - Metals, Hg, CrVI**  
Y / N  
Metals and Inorganics  
Metal Scan  
Hydride Forming Metals  
Client Custom Metals  
ORPs:  B-HWS  Cl  CN  
 C<sup>6+</sup>  EC  FCC  NO<sub>3</sub>/NO<sub>2</sub>  
 Total N  Hg  pH  SAR  
Nutrients:  TP  NH<sub>3</sub>  TKN  
 NO<sub>3</sub>  NO<sub>2</sub>  TP  NO<sub>3</sub>  TKN  
Volatiles:  VOC  BTEX  THM

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions
ASB-1a,b,c	Jan 12/17		3		Positive step
ASB-2a,b,c	Jan 13		3		
ASB-3a,b,c			3		
ASB-4a,b,c			3		
ASB-5a,b,c			3		
SCT-1a,b,c	Jan 12/17		3		
SCT-2a,b,c			3		
SCT-3a,b,c			3		
SCT-4a,b,c			3		
SCT-5a,b,c			3		
SCT-6a,b,c			3		

**Samples Relinquished By (Print Name and Sign):**  
BSD Racher.  
Date: Jan 17/17 Time: 3:55  
**Samples Relinquished By (Print Name and Sign):**  
Date: \_\_\_\_\_ Time: \_\_\_\_\_  
**Samples Relinquished By (Print Name and Sign):**  
Date: \_\_\_\_\_ Time: \_\_\_\_\_

Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: <input type="checkbox"/> B-HWS <input type="checkbox"/> Cl <input type="checkbox"/> CN	<input type="checkbox"/> C <sup>6+</sup> <input type="checkbox"/> EC <input type="checkbox"/> FCC <input type="checkbox"/> NO <sub>3</sub> /NO <sub>2</sub>	Total N <input type="checkbox"/> Hg <input type="checkbox"/> pH <input type="checkbox"/> SAR	Nutrients: <input type="checkbox"/> TP <input type="checkbox"/> NH <sub>3</sub> <input type="checkbox"/> TKN	<input type="checkbox"/> NO <sub>3</sub> <input type="checkbox"/> NO <sub>2</sub> <input type="checkbox"/> TP <input type="checkbox"/> NO <sub>3</sub> <input type="checkbox"/> TKN	Volatiles: <input type="checkbox"/> VOC <input type="checkbox"/> BTEX <input type="checkbox"/> THM	CME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use	

**Samples Relinquished By (Print Name and Sign):**  
Shawn Jan 17/17  
Date: Jan 17/17 Time: 3:55  
**Samples Relinquished By (Print Name and Sign):**  
Date: \_\_\_\_\_ Time: \_\_\_\_\_  
**Samples Relinquished By (Print Name and Sign):**  
Date: \_\_\_\_\_ Time: \_\_\_\_\_

CLIENT NAME: TERRAPROBE INC.  
11 INDELL LANE  
BRAMPTON, ON L6T3Y3  
(905) 796-2650

ATTENTION TO: Suvish Melanta

PROJECT: Main St 1-17-0005-48

AGAT WORK ORDER: 17T178831

ASBESTOS REVIEWED BY: Whenhong Zou, Lab Analyst

DATE REPORTED: Jan 23, 2017

PAGES (INCLUDING COVER): 5

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 17T178831  
PROJECT: Main St 1-17-0005-48

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.  
SAMPLING SITE:

ATTENTION TO: Suvish Melania  
SAMPLED BY: Bob Racher

DATE RECEIVED: 2017-01-17		DATE REPORTED: 2017-01-23									
SAMPLE DESCRIPTION:		FT - 1a	FT - 1b	FT - 1c	FT - 2a	FT - 2b	FT - 2c	FT - 3a	FT - 3b		
SAMPLE TYPE:		Other	Other	Other	Other	Other	Other	Other	Other		
DATE SAMPLED:		2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12		
G / S		RDL	RDL	RDL	RDL	RDL	RDL	RDL	RDL		
Parameter	Unit	%	%	%	%	%	%	%	%		
Asbestos (Bulk)	%	0.5	ND	ND	ND	ND	ND	0.5-5	SP		
SAMPLE DESCRIPTION:		FT - 3c	FT - 4a	FT - 4b	FT - 4c	FT - 5a	FT - 5b	FT - 5c	FT - 6a		
SAMPLE TYPE:		Other	Other	Other	Other	Other	Other	Other	Other		
DATE SAMPLED:		2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12		
G / S		RDL	RDL	RDL	RDL	RDL	RDL	RDL	RDL		
Parameter	Unit	%	%	%	%	%	%	%	%		
Asbestos (Bulk)	%	0.5	ND								
SAMPLE DESCRIPTION:		FT - 6b	FT - 6c	FT - 7a	FT - 7b	FT - 7c	FT - 8a	FT - 8b	FT - 8c		
SAMPLE TYPE:		Other	Other	Other	Other	Other	Other	Other	Other		
DATE SAMPLED:		2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12		
G / S		RDL	RDL	RDL	RDL	RDL	RDL	RDL	RDL		
Parameter	Unit	%	%	%	%	%	%	%	%		
Asbestos (Bulk)	%	0.5	ND	0.5-5	SP	SP	ND	ND	ND		
SAMPLE DESCRIPTION:		FT - 9a	FT - 9b	FT - 9c	FT - 10a	FT - 10b	FT - 10c	FT - 11a	FT - 11b		
SAMPLE TYPE:		Other	Other	Other	Other	Other	Other	Other	Other		
DATE SAMPLED:		2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12		
G / S		RDL	RDL	RDL	RDL	RDL	RDL	RDL	RDL		
Parameter	Unit	%	%	%	%	%	%	%	%		
Asbestos (Bulk)	%	0.5	ND								
SAMPLE DESCRIPTION:		FT - 11c									
SAMPLE TYPE:		Other									
DATE SAMPLED:		2017-01-13									
G / S		RDL									
Parameter	Unit	%									
Asbestos (Bulk)	%	0.5									

*Wenhong Zou*

Certified By:



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 17T178831  
PROJECT: Main St 1-17-0005-48

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.  
SAMPLING SITE:

ATTENTION TO: Suvish Melania  
SAMPLED BY: Bob Racher

DATE RECEIVED: 2017-01-17	DATE REPORTED: 2017-01-23
---------------------------	---------------------------

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8132765-8132773 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

8132774 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Chrysotile

8132775-8132779 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

8132780-8132801 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

8132804 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Chrysotile

8132805-8132806 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

8132808-8132832 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

*Wenhong Zou*

Certified By:

## Method Summary

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 17T178831

PROJECT: Main St 1-17-0005-48

ATTENTION TO: Suvish Melanta

SAMPLING SITE:

SAMPLED BY: Bob Racher

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Asbestos (Bulk)	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM



AGAT Laboratories

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph: 905.712.5100 Fax: 905.712.5122  
webearth.agatlabs.com

**Laboratory Use Only**

Work Order #: **17T178831**

Cooler Quantity: \_\_\_\_\_

Arrival Temperatures: \_\_\_\_\_

Custody Seal Intact:  Yes  No  N/A

Notes: \_\_\_\_\_

**Chain of Custody Record** If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

**Regulatory Requirements:**  No Regulatory Requirement  
(Please check all applicable boxes)

Regulation 153/04  Sewer Use  Regulation 558

Table - Indicate One:  Sanitary  CCME

Ind/Com  Res/ParK  Storm  Prov. Water Quality Objectives (PWOQ)

Agriculture  Other

Soil Texture (Check One):  Coarse  Fine  Other \_\_\_\_\_

Region: \_\_\_\_\_ Indicate One

**Report Guideline on Certificate of Analysis**

Is this submission for a Record of Site Condition?  Yes  No

**Report Information:**

Company: TerraProbe

Contact: Suvish melanta

Address: Brampton ON.

Phone: \_\_\_\_\_

Reports to be sent to: smelanta@terraprobe.ca

1. Email: \_\_\_\_\_

2. Email: \_\_\_\_\_

**Project Information:**

Project: Main St. 1-17-0005-40

Site Location: B. Racher.

Sampled By: \_\_\_\_\_

AGAT Quote #: \_\_\_\_\_

PO: \_\_\_\_\_

Bill To Same: Yes  No

**Invoice Information:**

Company: \_\_\_\_\_

Contact: \_\_\_\_\_

Address: \_\_\_\_\_

Email: \_\_\_\_\_

**Turnaround Time (TAT) Required:**

**Regular TAT**  5 to 7 Business Days

**Rush TAT** (Rush Surcharges Apply)

3 Business Days  2 Business Days  1 Business Day

**OR** Date Required (Rush Surcharges May Apply): \_\_\_\_\_

Please provide prior notification for rush TAT  
\*TAT is exclusive of weekends and statutory holidays

**Sample Matrix Legend**

B Biota  
GW Ground Water  
O Oil  
P Paint  
S Soil  
SD Sediment  
SW Surface Water

Field Filtered - Metals, Hg, Cr (Please Circle)	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: B-HWS, Cl, CN, Cr, EC, FOC, NO <sub>2</sub> , NO <sub>3</sub>	Total N, Hg, pH, SAR	Nutrients: TP, NH <sub>3</sub> , TN, NO <sub>2</sub> , NO <sub>3</sub> , TXN	Volatiles: VOC, BTEX, THM
Y/N	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: B-HWS, Cl, CN, Cr, EC, FOC, NO <sub>2</sub> , NO <sub>3</sub>	Total N, Hg, pH, SAR	Nutrients: TP, NH <sub>3</sub> , TN, NO <sub>2</sub> , NO <sub>3</sub> , TXN	Volatiles: VOC, BTEX, THM
	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCP Metals/Inorganics	Sewer Use

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/Special Instructions
FT-1a,b,c	Jan 17/17		3	solid	Stop Positive
FT-2a,b,c			3		
FT-3a,b,c			3		
FT-4a,b,c			3		
FT-5a,b,c			3		
FT-6a,b,c			3		
FT-7a,b,c			3		
FT-8a,b,c			3		
FT-9a,b,c			3		
FT-10a,b,c			3		
FT-11a,b,c	Jan 17/17		3		

**Samples Returned By (Print Name and Sign):** Shaymin Jan 17/17

**Samples Received By (Print Name and Sign):** \_\_\_\_\_

**Samples Returned By (Print Name and Sign):** \_\_\_\_\_

Date: Jan 17/17 Time: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Page 1 of 1

NP: **T 037417**

CLIENT NAME: TERRAPROBE INC.  
11 INDELL LANE  
BRAMPTON, ON L6T3Y3  
(905) 796-2650

ATTENTION TO: Suvish Melanta

PROJECT: 1-17-0005-48

AGAT WORK ORDER: 17T178829

ASBESTOS REVIEWED BY: Whenhong Zou, Lab Analyst

DATE REPORTED: Mar 10, 2017

PAGES (INCLUDING COVER): 4

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 17T178829

PROJECT: 1-17-0005-48

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.  
SAMPLING SITE:

ATTENTION TO: Suvish Melania  
SAMPLED BY: Bob Rocher

DATE RECEIVED: 2017-01-17		DATE REPORTED: 2017-03-10	
Bulk Asbestos			
SAMPLE DESCRIPTION:	TSI - 1a	TSI - 1b	TSI - 1c
	Other	Other	Other
SAMPLE TYPE:	2017-01-13	2017-01-13	2017-01-13
DATE SAMPLED:	8132738	8132739	8132740
G / S	RDL	RDL	RDL
Unit	%	%	%
Asbestos (Bulk)	0.5	ND	ND
TSI - 2a	TSI - 2b	TSI - 2c	pipe-1
Other	Other	Other	Other
2017-01-13	2017-01-13	2017-01-13	2017-01-13
8132742	8132743	8132744	8240539
>75	SP	SP	>75

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8132738 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

8132739-8132740 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

8132742 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Chrysotile

8132743-8132744 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

SP: Stop Positive

8240539 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Chrysotile

*Wenhong Zou*

Certified By:

## Method Summary

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 17T178829

PROJECT: 1-17-0005-48

ATTENTION TO: Suvish Melanta

SAMPLING SITE:

SAMPLED BY: Bob Rocher

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Asbestos (Bulk)	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM



CLIENT NAME: TERRAPROBE INC.  
11 INDELL LANE  
BRAMPTON, ON L6T3Y3  
(905) 796-2650

ATTENTION TO: Suvish Melanta

PROJECT: 1-17-0005-48

AGAT WORK ORDER: 17T178833

OCCUPATIONAL HYGIENE REVIEWED BY: Elizabeth Polakowska, MSc (Animal Sci), PhD (Agri Sci), Inorganic Lab Supervisor

DATE REPORTED: Jan 23, 2017

PAGES (INCLUDING COVER): 6

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.





## Method Summary

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 17T178833

PROJECT: 1-17-0005-48

ATTENTION TO: Suvish Melanta

SAMPLING SITE:

SAMPLED BY: Bob Racher

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Occupational Hygiene Analysis Lead	MET-93-6106	EPA SW 846 3050B & 6010C	ICP/OES





# AGAT Laboratories

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph: 905.712.5100 Fax: 905.712.5122  
webearth.agatlabs.com

## Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

**Report Information:**  
 Company: Terraprobe Inc.  
 Contact: Sukish Melanta  
 Address: Brampton ont.  
 Phone: \_\_\_\_\_  
 Reports to be sent to:  
 1. Email: smelanta@terraprobe.ca  
 2. Email: \_\_\_\_\_

**Project Information:**  
 Project: 1-17-0005-48  
 Site Location: Bravo St.  
 Sampled By: B. Kacher  
 AGAT Quote #: \_\_\_\_\_ PO: \_\_\_\_\_

**Invoice Information:**  
 Company: \_\_\_\_\_  
 Contact: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Email: \_\_\_\_\_  
 Bill To Same: Yes  No

**Regulatory Requirements:**  Sewer Use  Regulation 153/04  Regulation 558  
 (Please check all applicable boxes)  
 Table Indicate One:  Sanitary  CCME  
 Lind/Conn  Priv. Water Quality Objectives (PWQO)  
 Res/Park  Storm  Other  
 Agriculture  Other  
 Soil Texture (Check One):  Coarse  Fine  
 Indicate One: \_\_\_\_\_

**Report Guideline on Certificate of Analysis**  
 Is this submission for a Record of Site Condition?  Yes  No

**Laboratory Use Only**  
 Work Order #: \_\_\_\_\_  
 Cooler Quantity: \_\_\_\_\_  
 Arrival Temperatures: \_\_\_\_\_  
 Custody Seal Intact:  Yes  No  N/A  
 Notes: \_\_\_\_\_

**Turnaround Time (TAT) Required:**  
 Regular TAT  3 to 7 Business Days  
 Rush TAT (Rush surcharges Apply)  
 3 Business Days  2 Business Days  1 Business Day

OR Date Required (Rush Surcharges May Apply): \_\_\_\_\_  
 Please provide prior notification for rush TAT  
 \*TAT is exclusive of weekends and statutory holidays

**Sample Matrix Legend**  
 B Biota  
 GW Ground Water  
 O Oil  
 P Paint  
 S Soil  
 SD Sediment  
 SW Surface Water

**Field Filtered - Metals, Hg, CrVI** (Please Circle)  
 Y / N  
 Metals and Inorganics  
 Metal Scan  
 Hydride Forming Metals  
 Client Custom Metals  
 ORPs:  B-HWS  Cr  CN  
 Cr<sup>6+</sup>  EC  FOC  NO<sub>2</sub>/NO<sub>3</sub>  
 Total N  Hg  PH  SAR  
 Nutrients:  TP  NH<sub>3</sub>  TKN  
 NO<sub>2</sub>  NO<sub>3</sub>  NO<sub>2</sub>/NO<sub>3</sub>  
 Volatiles:  VOC  BTEX  THM

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/Special Instructions
Pb-12	Jan 12/17		1	P	
Pb-13			1		
Pb-14			1		
Pb-15	Jan 13/17		1		
Pb-16			1		
Pb-17			1		
Pb-18			1		
Pb-19			1		
Pb-20			1		
Pb-21			1		

Samples Requisitioned By (Print Name and Sign): B. Kacher Date: Jan 17/17  
 Samples Requisitioned By (Print Name and Sign): Shoamin Date: \_\_\_\_\_  
 Samples Requisitioned By (Print Name and Sign): \_\_\_\_\_ Date: \_\_\_\_\_

CLIENT NAME: TERRAPROBE INC.  
11 INDELL LANE  
BRAMPTON, ON L6T3Y3  
(905) 796-2650

ATTENTION TO: Suvish Melanta

PROJECT: 1-17-0005-48

AGAT WORK ORDER: 17T178835

ASBESTOS REVIEWED BY: Whenhong Zou, Lab Analyst

DATE REPORTED: Jan 23, 2017

PAGES (INCLUDING COVER): 5

VERSION\*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

\*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



# AGAT Laboratories

## Certificate of Analysis

AGAT WORK ORDER: 17T178835

PROJECT: 1-17-0005-48

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.  
SAMPLING SITE:

ATTENTION TO: Suvish Melania  
SAMPLED BY: Bob Racher

DATE RECEIVED: 2017-01-17		DATE REPORTED: 2017-01-23														
<b>Bulk Asbestos</b>																
SAMPLE DESCRIPTION: JC - 1		Other	JC - 2	Other	JC - 3	Other	JC - 4	Other	JC - 5	Other	JC - 6	Other	JC - 7	Other	JC - 8	Other
SAMPLE TYPE:		2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12
DATE SAMPLED:		8133209	8133225	8133226	8133227	8133228	8133227	8133227	8133228	8133229	8133229	8133230	8133231	8133230	8133231	8133231
Parameter	Unit	G / S	RDL													
Asbestos (Bulk)	%	0.5	ND													
SAMPLE DESCRIPTION: JC - 9		Other	JC - 10	Other	JC - 11	Other	JC - 12	Other	JC - 13	Other	JC - 14	Other	JC - 15	Other	JC - 16	Other
SAMPLE TYPE:		2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12	2017-01-12
DATE SAMPLED:		8133232	8133233	8133234	8133235	8133239	8133235	8133235	8133239	8133240	8133241	8133241	8133242	8133241	8133242	8133242
Parameter	Unit	G / S	RDL													
Asbestos (Bulk)	%	0.5	ND													
SAMPLE DESCRIPTION: JC - 17		Other	JC - 18	Other	JC - 19	Other										
SAMPLE TYPE:		2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13	2017-01-13
DATE SAMPLED:		8133248	8133258	8133259	8133258	8133259	8133258	8133258	8133259	8133259	8133259	8133259	8133259	8133259	8133259	8133259
Parameter	Unit	G / S	RDL													
Asbestos (Bulk)	%	0.5	ND													

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard  
8133209-8133259 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

"ND" - Not Detected

*Wenhong Zou*

Certified By:



5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

## Method Summary

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 17T178835

PROJECT: 1-17-0005-48

ATTENTION TO: Suvish Melanta

SAMPLING SITE:

SAMPLED BY: Bob Racher

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Asbestos (Bulk)	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM





# AGAT Laboratories

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph: 905.712.5100 Fax: 905.712.5122  
webearth.agallabs.com

## Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

**Report Information:**  
 Company: Terraprobe, Inc.  
 Contact: Suwish Melanta  
 Address: Brampton on  
 Phone: \_\_\_\_\_  
 Reports to be sent to: \_\_\_\_\_  
 1. Email: smelanta@terraprobe.ca  
 2. Email: \_\_\_\_\_

**Project Information:**  
 Project: 1-17-0005-48  
 Site Location: Main St.  
 Sampled By: Bob Kacher  
 AGAT Quote #: \_\_\_\_\_ PO: \_\_\_\_\_

**Invoice Information:**  
 Company: \_\_\_\_\_  
 Contact: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Email: \_\_\_\_\_  
 Bill To Same: Yes  No

**Regulatory Requirements:**  No Regulatory Requirement  
 (Please check all applicable boxes)

Regulation 153/04  Sewer Disc  Regulation 558  
 Table - Indicate One  Sanitary  LCCME  
 Ind/Com  Prov. Water Quality Objectives (PWQO)  
 Res/Park  Storm  Other  
 Agriculture  Soil Texture (check one)  Coarse  Fine

Region: \_\_\_\_\_ Indicate One

**Report Guideline on Certificate of Analysis**  
 Yes  No

Is this submission for a Record of Site Condition?  Yes  No

## Laboratory Use Only

Work Order #: \_\_\_\_\_  
 Cooler Quantity: \_\_\_\_\_  
 Arrival Temperatures: \_\_\_\_\_  
 Custody Seal Intact:  Yes  No  N/A  
 Notes: \_\_\_\_\_

**Turnaround Time (TAT) Required:**  
 Regular TAT  5 to 7 Business Days  
 Rush TAT (Rush Surcharges Apply)  
 3 Business Days  2 Business Days  1 Business Day

OR Date Required (Rush Surcharges May Apply): \_\_\_\_\_  
 Please provide prior notification for rush TAT  
 \* TAT is exclusive of weekends and statutory holidays

**Sample Matrix Legend**  
 B Biota  
 GW Ground Water  
 O Oil  
 P Paint  
 S Soil  
 SD Sediment  
 SW Surface Water

Field Filtered - Metals, Hg, CMI (Please Circle) Y / N

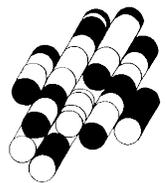
Metals and Inorganics  
 Metal Scan  
 Hydride Forming Metals  
 Client Custom Metals  
 ORPs: B-HWS  Cl  CN  C<sub>2</sub>  EC  FOC  NO<sub>2</sub>  NO<sub>3</sub>  Total N  Hg  PH  SAR  
 Nutrients: TP  NH<sub>3</sub>  TKN  NO<sub>2</sub>  NO<sub>3</sub>  VOC  BTEX  THM  
 Volatiles:  VOC  BTEX  THM

Sample ID	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/Special Instructions
JC-12	Jan 12/17		1	Solid	
JC-13			1		
JC-14			1		
JC-15			1		
JC-16	Jan 13/17		1		
JC-17			1		
JC-18			1		
JC-19			1		

Sample Requested By (Print Name and Sign)	Date	Time	Sample Received By (Print Name and Sign)	Date	Time
Bob Kacher	Jan 17/17		Shomina	Jan 17/17	
Bob Kacher					

# APPENDIX B

**TERRAPROBE INC.**





Photograph 1

Sample ID: SCT-1-19

Location: 294 Main Street, Suite 101



Photograph 2

Sample ID: JC-1-19

Location: 294 Main Street, 1<sup>st</sup> floor



Photograph 3

Sample ID: SCT-2-19

Location: 294 Main Street, 1<sup>st</sup> floor,  
Pharmacy





Photograph 4

Sample ID: PB-1-19

Location: 294 Main Street, 1<sup>st</sup> floor,  
back office of Pharmacy



Photograph 5

Sample ID: SCT-3-19

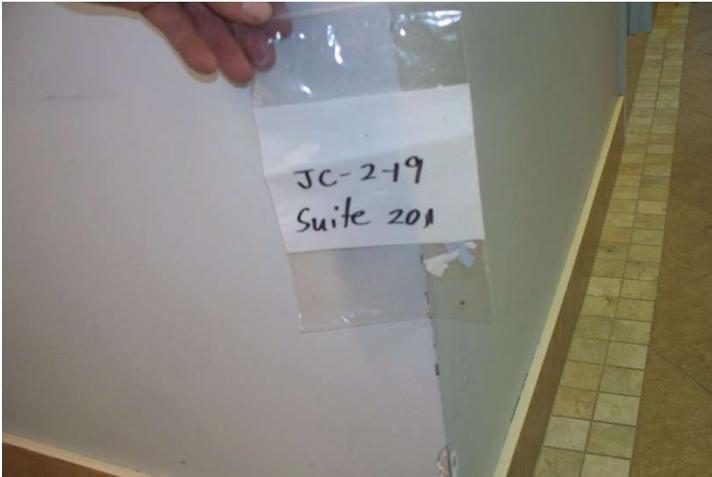
Location: 294 Main Street, Suite 201



Photograph 6

Sample ID: PB-2-19

Location: 294 Main Street, Suite 201



Photograph 7

Sample ID: JC-2-19

Location: 294 Main Street, Suite 201



Photograph 8

Sample ID: SCT-4-19

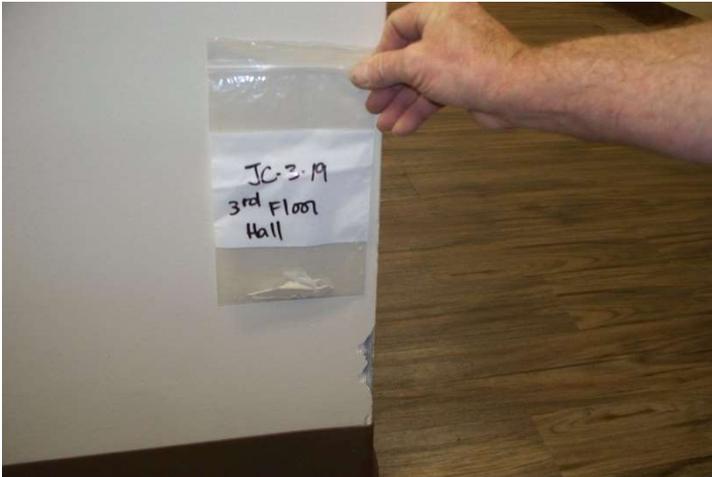
Location: 294 Main Street, Suite 207



Photograph 9

Sample ID: PB-3-19

Location: 294 Main Street, 3<sup>rd</sup> floor stairs



Photograph 10

Sample ID: JC-3-19

Location: 294 Main Street, 3<sup>rd</sup> floor hall



Photograph 11

Sample ID: SCT-5-19

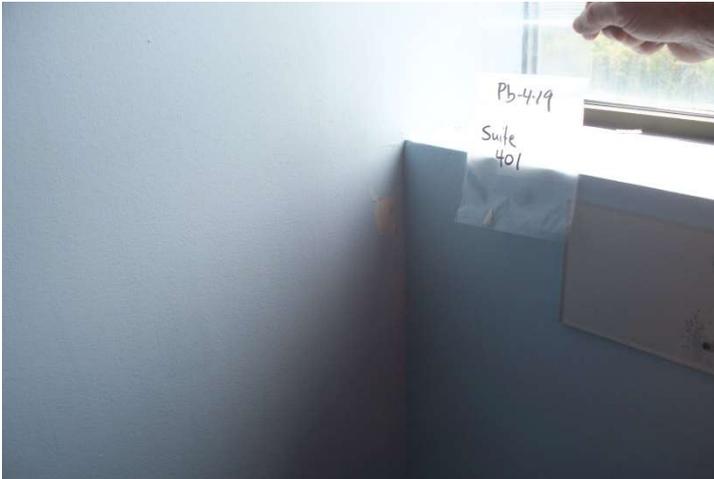
Location: 294 Main Street, 3<sup>rd</sup> floor hall



Photograph 12

Sample ID: JC-4-19

Location: 294 Main Street, suite 401



Photograph 13

Sample ID: Pb-4-19

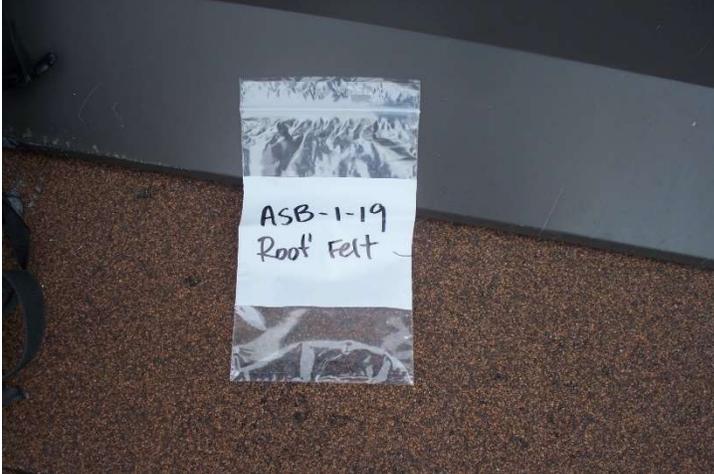
Location: 294 Main Street, suite 401



Photograph 14

Sample ID: Pb-5-19

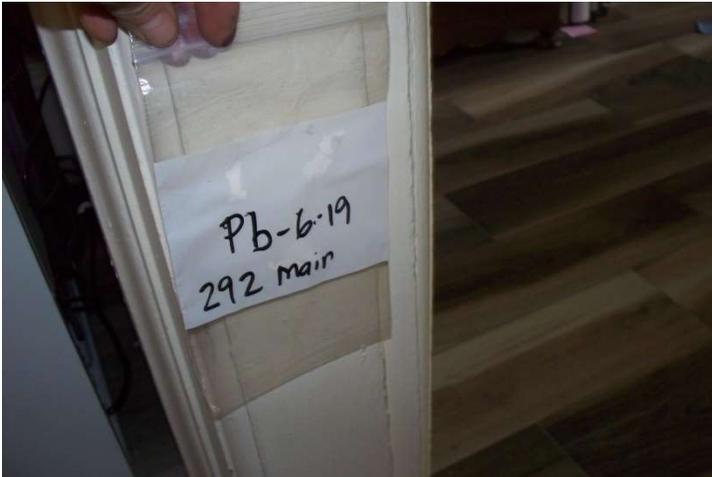
Location: 294 Main Street, 5<sup>th</sup> floor  
men's washroom



Photograph 15

Sample ID: ASB-1-19

Location: 294 Main Street, roof



Photograph 16

Sample ID: Pb-6-19

Location: 292 Main Street, main floor



Photograph 16

Sample ID: JC-5-19

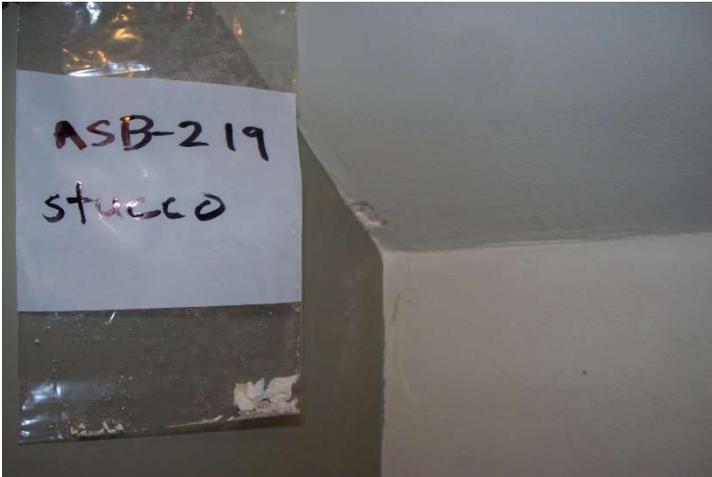
Location: 292 Main Street, 2<sup>nd</sup> floor apartment



Photograph 17

Sample ID: JC-6-19

Location: 292 Main Street, 2<sup>nd</sup> floor bedroom



Photograph 18

Sample ID: ASB-2-19

Location: 292 Main Street, 2<sup>nd</sup> floor apartment



Photograph 19

Sample ID: Pb-7-19

Location: 292 Main Street, basement stairs



Photograph 20

Sample ID: FT-1-19

Location: 288 - 290 Main Street, 1<sup>st</sup> floor

1-17-0005-48.2

Designated Substance Survey Photographs  
276 – 294 Main Street, Toronto, Ontario



Photograph 21

Sample ID: Pb-10-19

Location: 288 - 290 Main Street, 1<sup>st</sup>  
floor



Photograph 22

Sample ID: Pb-11-19

Location: 286 Main Street, basement



Photograph 23

Sample ID: FT-2-19

Location: 286 Main Street, basement  
stairs





Photograph 24

Sample ID: SCT-7-19

Location: 286 Main Street, ceiling



Photograph 24

Sample ID: Pb-12-19

Location: 286 Main Street, bathroom door



Photograph 25

Sample ID: FT-3-19

Location: 286 Main Street, floor



Photograph 26

Sample ID: SCT-8-19

Location: 286 Main Street, ceiling



Photograph 27

Sample ID: JC-6-19

Location: 288-290 Main Street, 2<sup>nd</sup> floor



Photograph 28

Sample ID: Pb-13-19

Location: 288-290 Main Street, 2<sup>nd</sup> floor



Photograph 29

Sample ID: FT-4-19

Location: 288-290 Main Street, 2<sup>nd</sup> floor  
hall



Photograph 30

Sample ID: ASB-3-19

Location: 288-290 Main Street, roof  
patio



Photograph 31

Sample ID: ASB-4-19

Location: 276 Main Street, electrical  
room ceiling



Photograph 32

Sample ID: FT-5-19

Location: 276 Main Street, east side of basement



Photograph 33

Sample ID: ASB-5-19

Location: 276 Main Street, basement ceiling



Photograph 34

Sample ID: JC-8-19

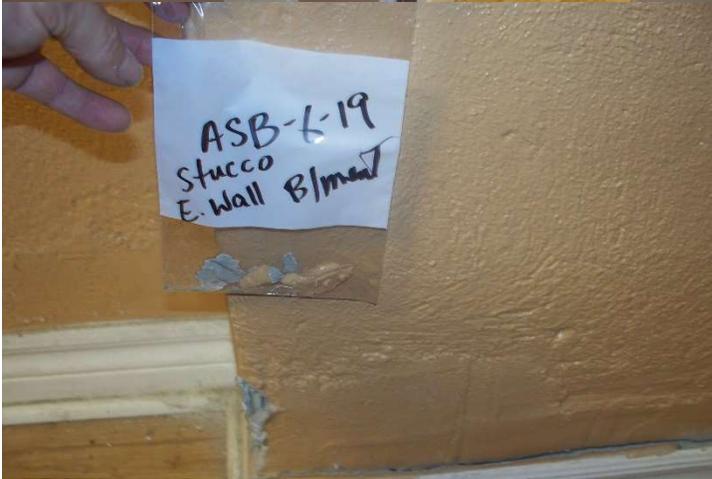
Location: 276 Main Street, basement columns



Photograph 35

Sample ID: Pb-16-19

Location: 276 Main Street, basement walls



Photograph 36

Sample ID: ASB-6-19

Location: 276 Main Street, east basement walls



Photograph 37

Sample ID: ASB-7-19

Location: 276 Main Street, furnace room

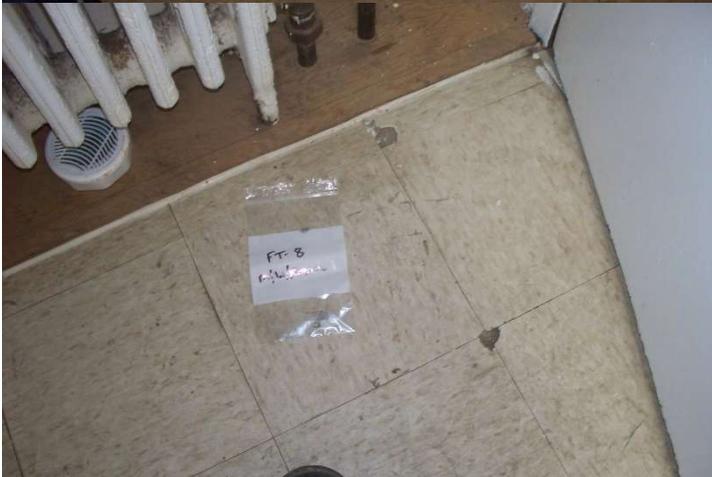




Photograph 41

Sample ID: JC-10-19

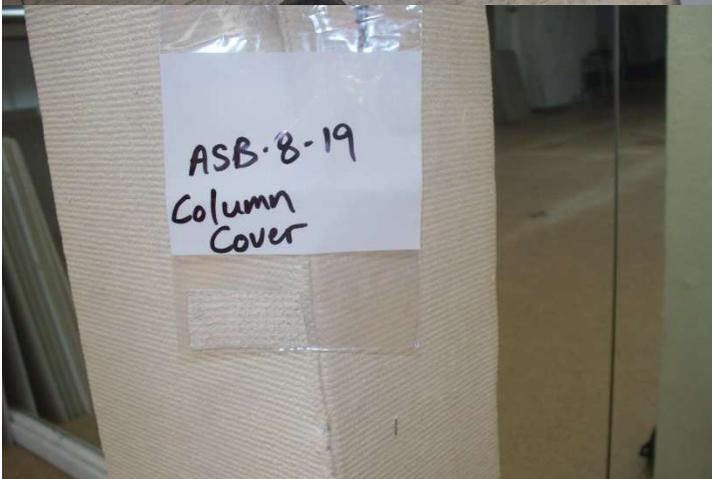
Location: 276 Main Street, 1<sup>st</sup> floor



Photograph 42

Sample ID: FT-8-19

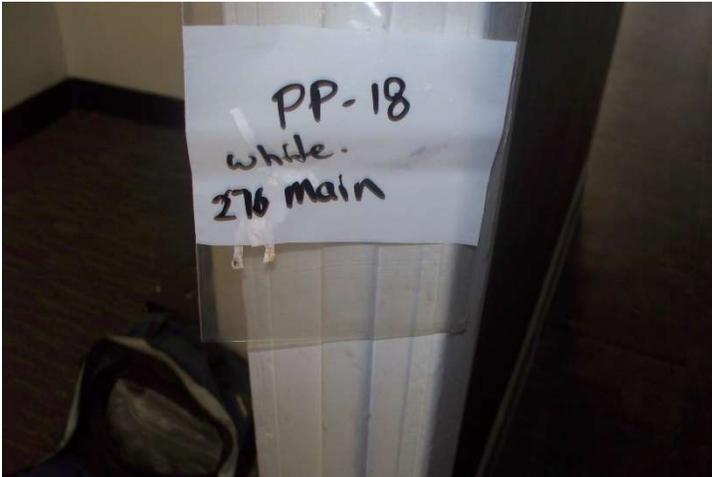
Location: 276 Main Street, 1<sup>st</sup> floor,  
washroom



Photograph 43

Sample ID: ASB-8-19

Location: 276 Main Street, 1<sup>st</sup> floor,  
dance studio



Photograph 44

Sample ID: Pb-18-19

Location: 276 Main Street, 1<sup>st</sup> floor



Photograph 45

Sample ID: SCT-9-19

Location: 276 Main Street, 1<sup>st</sup> floor



Photograph 46

Sample ID: JC-11-19

Location: 276 Main Street, 1<sup>st</sup> floor

1-17-0005-48.2

Designated Substance Survey Photographs  
276 – 294 Main Street, Toronto, Ontario



Photograph 47

Sample ID: FT-9-19

Location: 276 Main Street, 1<sup>st</sup> floor



Photograph 48

Sample ID: FT-10-19

Location: 276 Main Street, 1<sup>st</sup> floor



Photograph 49

Sample ID: Pb-19-19

Location: 276 Main Street, 1<sup>st</sup> floor, east room





Photograph 49

Sample ID: FT-11-19

Location: 276 Main Street, 2<sup>nd</sup> floor



Photograph 50

Sample ID: FT-12-19

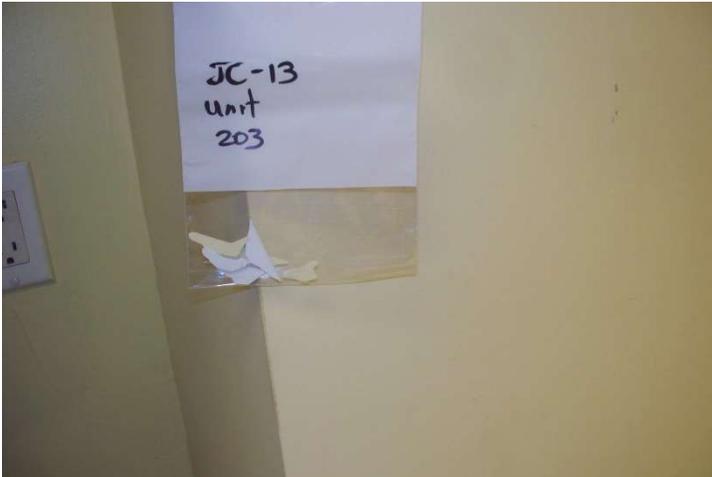
Location: 276 Main Street, 2<sup>nd</sup> floor



Photograph 51

Sample ID: FT-13-19

Location: 276 Main Street, 2<sup>nd</sup> floor



Photograph 52

Sample ID: JC-13-19

Location: 276 Main Street, Suite 203



Photograph 53

Sample ID: ASB-10-19

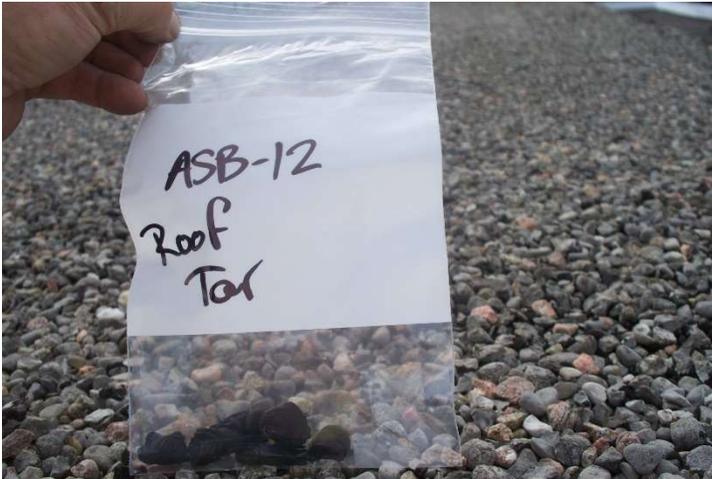
Location: 276 Main Street, roof window frame



Photograph 53

Sample ID: ASB-11-19

Location: 276 Main Street, roof



Photograph 54

Sample ID: ASB-12-19

Location: 276 Main Street, roof



Photograph 55

Sample ID: JC-14-19

Location: 276 Main Street, Suite 202



Photograph 56

Sample ID: Pb-21-19

Location: 276 Main Street, Suite 202,  
west wall

**PHOTOGRAPHS: 286-296 MAIN STREET, TORONTO, ON**



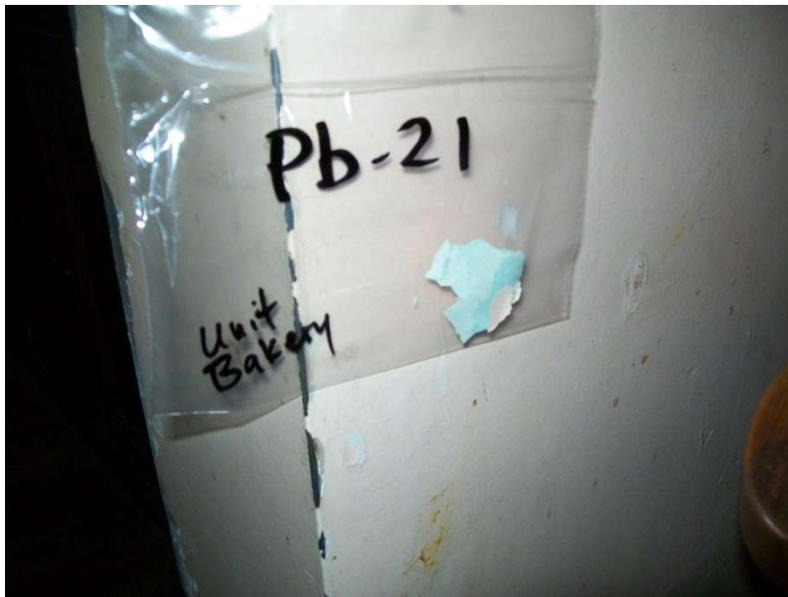
**PHOTOGRAPH 1: ACM pipe insulation located in basement of 290 Main Street.**



**PHOTOGRAPH 2: ACM window caulking at 290 Main Street.**



**PHOTOGRAPH 3:** Lead-containing paint (yellow) located in basement of 290 Main Street.



**PHOTOGRAPH 4:** Lead-containing paint (beige over blue) in the 1<sup>st</sup> floor main room at 290 Main Street.



**PHOTOGRAPH 5: ACM stucco coating on walls in basement of 292 Main Street.**



**PHOTOGRAPH 6: Lead-containing paint (yellow) in the 1<sup>st</sup> floor washroom at 292 Main Street.**



**PHOTOGRAPH 7: Lead-containing paint located in the main room of the basement at 292 Main Street.**



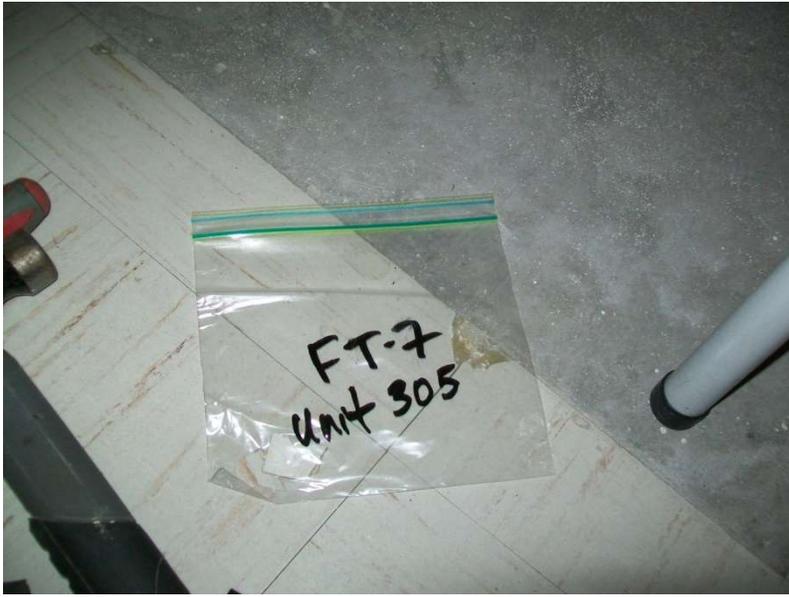
**PHOTOGRAPH 8: Lead-containing paint (beige) on the exterior of 292 Main Street.**



**PHOTOGRAPH 9: ACM ceiling tiles located in 294 Main Street, in the basement utility room, Suite 301, Suite 501b and in the vacant (un-numbered) suite on the 5<sup>th</sup> floor.**



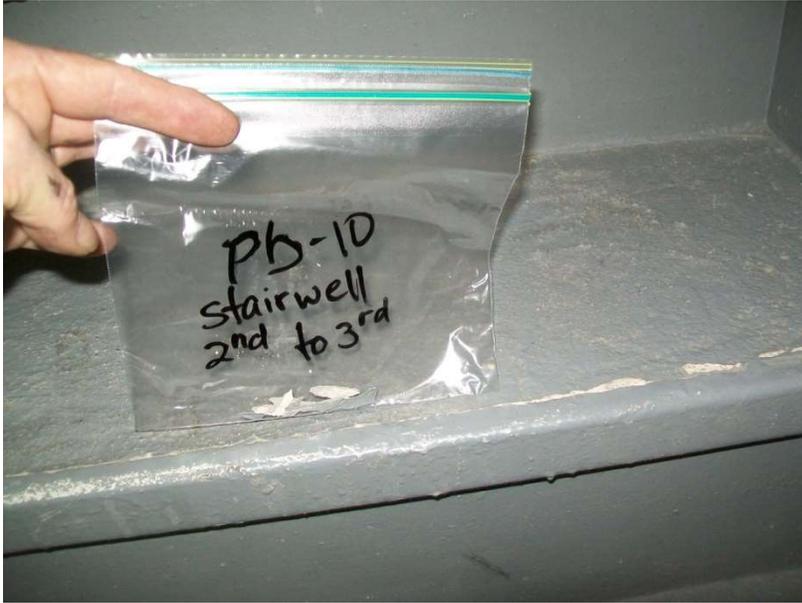
**PHOTOGRAPH 10: ACM vinyl floor tiles located in Suite 102 at 294 Main Street. The blue tiles do not contain asbestos.**



**PHOTOGRAPH 11: ACM vinyl floor tiles located in Suite 305 of 294 Main Street.**



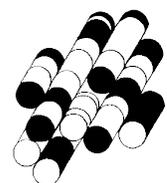
**PHOTOGRAPH 12: Lead-containing paint (light blue) located in Suite 507 at 294 Main Street.**



**PHOTOGRAPH 13:** Lead-containing paint located in the 3<sup>rd</sup> floor stairwell at 294 Main Street.

# APPENDIX C

**TERRAPROBE INC.**



# ONTARIO REGULATION 278/05

*No Amendments*

## DESIGNATED SUBSTANCE – ASBESTOS ON CONSTRUCTION PROJECTS AND IN BUILDINGS AND REPAIR OPERATIONS

Note: This Regulation comes into force on November 1, 2005. See: O. Reg. 278/05, s. 26 (1).

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---

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<b>Restrictions re Sprayed Material, Insulation, Sealants</b>	4.
<b>Information for Workers</b>	5.
<b>Demolition</b>	6.
<b>Ongoing Asbestos Management in Buildings, Two-Year Transitional Period</b>	7.
<b>Ongoing Asbestos Management in Buildings After Transitional Period</b>	8.
<b>Responsibility of Employer Other Than Owner</b>	9.
<b>Owner's Responsibilities Before Requesting Tender or Arranging Work</b>	10.
<b>Advance Notice re Type 3 Operations and Certain Type 2 Operations</b>	11.
<b>Type 1, Type 2 and Type 3 Operations</b>	12.
<b>Respirators</b>	13.
<b>Measures and Procedures, Type 1 Operations</b>	14.
<b>Measures and Procedures, Type 2 and Type 3 Operations</b>	15.
<b>Additional Measures and Procedures, Type 2 Operations</b>	16.
<b>Additional Measures and Procedures, Glove Bag Operations</b>	17.
<b>Additional Measures and Procedures, Type 3 Operations</b>	18.
<b>Instruction and Training</b>	19.
<b>Asbestos Abatement Training Programs</b>	20.
<b>Asbestos Work Report</b>	21.
<b>Asbestos Workers Register</b>	22.
<b>Use of Equivalent Measure or Procedure</b>	23.
<b>Notice to Inspector</b>	24.
<b>Table 1: Bulk Material Samples</b>	Table 1
<b>Table 2: Respirators</b>	Table 2
<b>Table 3: Air Samples</b>	Table 3

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## DEFINITIONS

1. (1) In this Regulation,

“asbestos” means any of the fibrous silicates listed in subsection (2);

“asbestos-containing material” means material that contains 0.5 per cent or more asbestos by dry weight;

“building” means any structure, vault, chamber or tunnel including, without limitation, the electrical, plumbing, heating and air handling equipment (including rigid duct work) of the structure, vault, chamber or tunnel;

“competent worker”, in relation to specific work, means a worker who,

- (a) is qualified because of knowledge, training and experience to perform the work,
- (b) is familiar with the Act and with the provisions of the regulations that apply to the work, and
- (c) has knowledge of all potential or actual danger to health or safety in the work;

“demolition” includes dismantling and breaking up;

“examine”, when used with reference to material, means to carry out procedures in accordance with section 3 to establish its asbestos content and to establish the type of asbestos, and “examination” has a corresponding meaning;

“friable material” means material that,

- (a) when dry, can be crumbled, pulverized or powdered by hand pressure, or
- (b) is crumbled, pulverized or powdered;

“HEPA filter” means a high efficiency particulate aerosol filter that is at least 99.97 per cent efficient in collecting a 0.3 micrometre aerosol;

“homogeneous material” means material that is uniform in colour and texture;

“joint health and safety committee” means,

- (a) a joint health and safety committee established under section 9 of the Act,
- (b) a similar committee described in subsection 9 (4) of the Act, or
- (c) the workers or their representatives who participate in an arrangement, program or system described in subsection 9 (4) of the Act;

“occupier” has the same meaning as in the *Occupiers’ Liability Act*;

“Type 1 operation” means an operation described in subsection 12 (2);

“Type 2 operation” means an operation described in subsection 12 (3);

“Type 3 operation” means an operation described in subsection 12 (4). O. Reg. 278/05, s. 1 (1).

(2) The fibrous silicates referred to in the definition of “asbestos” in subsection (1) are:

1. Actinolite.
2. Amosite.
3. Anthophyllite.
4. Chrysotile.
5. Crocidolite.
6. Tremolite. O. Reg. 278/05, s. 1 (2).

## APPLICATION

2. (1) This Regulation applies to,

- (a) every project, its owner, and every constructor, employer and worker engaged in or on the project;

- (b) the repair, alteration or maintenance of a building, the owner of the building, and every employer and worker engaged in the repair, alteration or maintenance;
- (c) every building in which material that may be asbestos-containing material has been used, and the owner of the building;
- (d) the demolition of machinery, equipment, aircraft, ships, locomotives, railway cars and vehicles, and every employer and worker engaged in the demolition; and
- (e) subject to subsection (3),
  - (i) work described in subsection (2) in which asbestos-containing material is likely to be handled, dealt with, disturbed or removed, and
  - (ii) every employer and worker engaged in the work. O. Reg. 278/05, s. 2 (1).

(2) Clause (1) (e) applies to,

- (a) the repair, alteration or maintenance of machinery, equipment, aircraft, ships, locomotives, railway cars and vehicles; and
- (b) work on a building that is necessarily incidental to the repair, alteration or maintenance of machinery or equipment. O. Reg. 278/05, s. 2 (2).

(3) This Regulation does not apply to an employer to whom Regulation 837 of the Revised Regulations of Ontario, 1990 (Designated Substance — Asbestos) applies in respect of those workers employed by the employer and engaged in the activities described in clause (1) (e) if the employer has on or before December 16, 1985 put into effect and maintained measures and procedures to control the exposure of workers to asbestos and has incorporated the same in an asbestos control program in accordance with Regulation 837 of the Revised Regulations of Ontario, 1990. O. Reg. 278/05, s. 2 (3).

(4) This Regulation does not apply to an owner of a private residence occupied by the owner or the owner's family or to an owner of a residential building that contains not more than four dwelling units, one of which is occupied by the registered owner or family of the registered owner. O. Reg. 278/05, s. 2 (4).

### **ADOPTION OF STANDARD**

**3.** (1) For the purposes of this Regulation, the method and procedures for establishing whether material is asbestos-containing material and for establishing its asbestos content and the type of asbestos shall be in accordance with the following standard:

- 1. U.S. Environmental Protection Agency. Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials. June 1993. O. Reg. 278/05, s. 3 (1).

(2) The procedures required by subsection (1) shall be carried out on bulk material samples that are randomly collected by a competent worker and are representative of each area of homogeneous material. O. Reg. 278/05, s. 3 (2).

(3) The minimum number of bulk material samples to be collected from an area of homogeneous material is set out in Table 1. O. Reg. 278/05, s. 3 (3).

(4) If analysis establishes that a bulk material sample contains 0.5 per cent or more asbestos by dry weight,

- (a) it is not necessary to analyze other bulk material samples taken from the same area of homogeneous material; and
- (b) the entire area of homogeneous material from which the bulk material sample was taken is deemed to be asbestos-containing material. O. Reg. 278/05, s. 3 (4).

### **RESTRICTIONS RE SPRAYED MATERIAL, INSULATION, SEALANTS**

**4.** (1) No person shall apply or install or cause to be applied or installed, by spraying, material containing 0.1 per cent or more asbestos by dry weight that can become friable. O. Reg. 278/05, s. 4 (1).

(2) No person shall apply or install or cause to be applied or installed, as thermal insulation, material containing 0.1 per cent or more asbestos by dry weight that can become friable. O. Reg. 278/05, s. 4 (2).

- (3) A liquid sealant shall not be applied to friable asbestos-containing material if,
  - (a) the material has visibly deteriorated; or
  - (b) the material's strength and its adhesion to the underlying materials and surfaces are insufficient to support its weight and the weight of the sealant. O. Reg. 278/05, s. 4 (3).

### **INFORMATION FOR WORKERS**

- 5. (1) This section applies whenever a worker is to do work that,
  - (a) involves material that,
    - (i) is asbestos-containing material,
    - (ii) is being treated as if it were asbestos-containing material,
    - (iii) is the subject of advice under section 9 or a notice under subsection 10 (8); or
  - (b) is to be carried on in close proximity to material described in clause (a) and may disturb it. O. Reg. 278/05, s. 5 (1).
- (2) The constructor or employer shall advise the worker and provide him or her with the following information:
  - 1. The location of all material described in clause (1) (a).
  - 2. For each location, whether the material is friable or non-friable.
  - 3. In the case of sprayed-on friable material, for each location,
    - i. if the material is known to be asbestos-containing material, the type of asbestos, if known, or
    - ii. in any other case, a statement that the material will be treated as though it contained a type of asbestos other than chrysotile. O. Reg. 278/05, s. 5 (2).

### **DEMOLITION**

- 6. (1) The demolition of all or part of machinery, equipment, a building, aircraft, locomotive, railway car, vehicle or ship shall be carried out or continued only when any asbestos-containing material that may be disturbed during the work has been removed to the extent practicable. O. Reg. 278/05, s. 6 (1).
- (2) Subsection (1) does not apply so as to prevent work necessary to gain access to the asbestos-containing material that is to be removed, if the workers doing the work are protected from the hazard. O. Reg. 278/05, s. 6 (2).

### **ONGOING ASBESTOS MANAGEMENT IN BUILDINGS, TWO-YEAR TRANSITIONAL PERIOD**

- 7. (1) This section does not apply on or after November 1, 2007. O. Reg. 278/05, s. 7 (1).
- (2) Subsection (3) applies if,
  - (a) the owner of a building treats friable material that has been used in the building for any purpose related to it, including insulation and fireproofing, as if it were asbestos-containing material;
  - (b) the owner of a building has been advised under section 9 of the discovery of friable material that may be asbestos-containing material;
  - (c) the owner of a building knows or ought reasonably to know that friable asbestos-containing material has been used in a building for any purpose related to the building, including insulation, and fireproofing;
  - (d) an examination under subsection (8) or section 10 establishes, or would have established if carried out as required, that friable asbestos-containing material has been used in a building for any purpose related to the building, including insulation and fireproofing; or
  - (e) a constructor or employer notifies the owner of a building, in accordance with subsection 10 (8), of the discovery of friable material that may be asbestos-containing material and that was not referred to in a report prepared under subsection 10 (4). O. Reg. 278/05, s. 7 (2).

- (3) If this subsection applies, the owner shall,
  - (a) prepare and keep on the premises a record containing the information set out in subsection (4);
  - (b) give any other person who is an occupier of the building written notice of any information in the record that relates to the area occupied by the person;
  - (c) give any employer with whom the owner arranges or contracts for work that is not described in clause 10 (1) (a) written notice of the information in the record, if the work,
    - (i) may involve material mentioned in the record, or
    - (ii) may be carried on in close proximity to such material and may disturb it;
  - (d) advise the workers employed by the owner who work in the building of the information in the record, if the workers may do work that,
    - (i) involves material mentioned in the record, or
    - (ii) is to be carried on in close proximity to such material and may disturb it;
  - (e) establish and maintain, for the training and instruction of every worker employed by the owner who works in the building and may do work described in clause (d), a program dealing with,
    - (i) the hazards of asbestos exposure,
    - (ii) the use, care and disposal of protective equipment and clothing to be used and worn when doing the work,
    - (iii) personal hygiene to be observed when doing the work, and
    - (iv) the measures and procedures prescribed by this Regulation; and
  - (f) inspect the material mentioned in the record at reasonable intervals in order to determine its condition. O. Reg. 278/05, s. 7 (3).
- (4) The record shall contain the following information:
  - 1. The location of all material described in clauses (2) (a), (b), (c), (d) and (e).
  - 2. In the case of sprayed-on material, for each location,
    - i. if the material is known to be asbestos-containing material, the type of asbestos, if known, or
    - ii. in any other case, a statement that the material will be treated as though it contained a type of asbestos other than chrysotile. O. Reg. 278/05, s. 7 (4).
- (5) The owner shall update the record described in clause (3) (a),
  - (a) at least once in each 12-month period; and
  - (b) whenever the owner becomes aware of new information relating to the matters the record deals with. O. Reg. 278/05, s. 7 (5).
- (6) If updating under subsection (5) results in any change to the record, clauses (3) (b), (c) and (d) apply with necessary modifications. O. Reg. 278/05, s. 7 (6).
- (7) An occupier who receives a notice under clause (3) (b) is responsible for performing the duties set out in clauses (3) (d) and (e) with respect to the occupier's own workers. O. Reg. 278/05, s. 7 (7).
- (8) If it is readily apparent that friable material used in a building as fireproofing or acoustical or thermal insulation has fallen and is being disturbed so that exposure to the material is likely to occur,
  - (a) the owner shall cause the material to be examined to establish whether it is asbestos-containing material; and
  - (b) until it has been established whether the material is asbestos-containing material, no further work involving the material shall be done. O. Reg. 278/05, s. 7 (8).
- (9) Subsection (8) does not apply if the work is carried out in accordance with this Regulation as though the material were asbestos-containing material and, in the case of sprayed-on material, as though it contained a type of asbestos other than chrysotile. O. Reg. 278/05, s. 7 (9).

(10) If the examination mentioned in subsection (8) establishes that the material is asbestos-containing material, or if the material is treated as though it were asbestos-containing material as described in subsection (9),

- (a) the owner shall cause the fallen material to be cleaned up and removed; and
- (b) if it is readily apparent that material will continue to fall because of the deterioration of the fireproofing or insulation, the owner shall repair, seal, remove or permanently enclose the fireproofing or insulation. O. Reg. 278/05, s. 7 (10).

(11) Subsection (10) does not apply if the fallen material is confined to an area that is,

- (a) above a closed false ceiling; and
- (b) not part of a return air plenum. O. Reg. 278/05, s. 7 (11).

### **ONGOING ASBESTOS MANAGEMENT IN BUILDINGS AFTER TRANSITIONAL PERIOD**

8. (1) This section applies on and after November 1, 2007. O. Reg. 278/05, s. 8 (1).

(2) Subsection (3) applies if,

- (a) the owner of a building treats material that has been used in the building for any purpose related to it, including insulation, fireproofing and ceiling tiles, as if it were asbestos-containing material;
- (b) the owner of a building has been advised under section 9 of the discovery of material that may be asbestos-containing material;
- (c) the owner of a building knows or ought reasonably to know that asbestos-containing material has been used in a building for any purpose related to the building, including insulation, fireproofing and ceiling tiles;
- (d) an examination under subsection (8) or section 10 establishes, or would have established if carried out as required, that asbestos-containing material has been used in a building for any purpose related to the building, including insulation, fireproofing and ceiling tiles; or
- (e) a constructor or employer advises the owner of a building, in accordance with subsection 10 (8), of the discovery of material that may be asbestos-containing material and that was not referred to in a report prepared under subsection 10 (4). O. Reg. 278/05, s. 8 (2).

(3) If this subsection applies, the owner shall,

- (a) prepare and keep on the premises a record containing the information set out in subsection (4);
- (b) give any other person who is an occupier of the building written notice of any information in the record that relates to the area occupied by the person;
- (c) give any employer with whom the owner arranges or contracts for work that is not described in clause 10 (1) (a) written notice of the information in the record, if the work,
  - (i) may involve material mentioned in the record, or
  - (ii) may be carried on in close proximity to such material and may disturb it;
- (d) advise the workers employed by the owner who work in the building of the information in the record, if the workers may do work that,
  - (i) involves material mentioned in the record, or
  - (ii) is to be carried on in close proximity to such material and may disturb it;
- (e) establish and maintain, for the training and instruction of every worker employed by the owner who works in the building and may do work described in clause (d), a program dealing with,
  - (i) the hazards of asbestos exposure,
  - (ii) the use, care and disposal of protective equipment and clothing to be used and worn when doing the work,
  - (iii) personal hygiene to be observed when doing the work, and

- (iv) the measures and procedures prescribed by this Regulation; and
  - (f) inspect the material mentioned in the record at reasonable intervals in order to determine its condition. O. Reg. 278/05, s. 8 (3).
- (4) The record shall contain the following information:
- 1. The location of all material described in clauses (2) (a), (b), (c), (d) and (e).
  - 2. For each location, whether the material is friable or non-friable.
  - 3. In the case of friable sprayed-on material, for each location,
    - i. if the material is known to be asbestos-containing material, the type of asbestos, if known, or
    - ii. in any other case, a statement that the material will be treated as though it contained a type of asbestos other than chrysotile. O. Reg. 278/05, s. 8 (4).
- (5) The owner shall update the record described in clause (3) (a),
- (a) at least once in each 12-month period; and
  - (b) whenever the owner becomes aware of new information relating to the matters the record deals with. O. Reg. 278/05, s. 8 (5).
- (6) If updating under subsection (5) results in any change to the record, clauses (3) (b), (c) and (d) apply with necessary modifications. O. Reg. 278/05, s. 8 (6).
- (7) An occupier who receives a notice under clause (3) (b) is responsible for performing the duties set out in clauses (3) (d) and (e) with respect to the occupier's own workers. O. Reg. 278/05, s. 8 (7).
- (8) If it is readily apparent that friable material used in a building as fireproofing or acoustical or thermal insulation has fallen and is being disturbed so that exposure to the material is likely to occur,
- (a) the owner shall cause the material to be examined to establish whether it is asbestos-containing material; and
  - (b) until it has been established whether the material is asbestos-containing material, no further work involving the material shall be done. O. Reg. 278/05, s. 8 (8).
- (9) Subsection (8) does not apply if the work is carried out in accordance with this Regulation as though the material were asbestos-containing material and, in the case of friable sprayed-on material, as though it contained a type of asbestos other than chrysotile. O. Reg. 278/05, s. 8 (9).
- (10) If the examination mentioned in subsection (8) establishes that the material is asbestos-containing material, or if the material is treated as though it were asbestos-containing material as described in subsection (9),
- (a) the owner shall cause the fallen material to be cleaned up and removed; and
  - (b) if it is readily apparent that material will continue to fall because of the deterioration of the fireproofing or insulation, the owner shall repair, seal, remove or permanently enclose the fireproofing or insulation. O. Reg. 278/05, s. 8 (10).
- (11) Subsection (10) does not apply if the fallen material is confined to an area that is,
- (a) above a closed false ceiling; and
  - (b) not part of a return air plenum. O. Reg. 278/05, s. 8 (11).

#### **RESPONSIBILITY OF EMPLOYER OTHER THAN OWNER**

**9.** An employer whose workers work in a building of which the employer is not the owner shall advise the owner if the workers discover material that may be asbestos-containing material in the building. O. Reg. 278/05, s. 9.

#### **OWNER'S RESPONSIBILITIES BEFORE REQUESTING TENDER OR ARRANGING WORK**

**10.** (1) An owner shall comply with subsections (2), (3), (4), (5) and (6) before,

- (a) requesting tenders for the demolition, alteration or repair of all or part of machinery, equipment, or a building, aircraft, locomotive, railway car, vehicle or ship; or
  - (b) arranging or contracting for any work described in clause (a), if no tenders are requested. O. Reg. 278/05, s. 10 (1).
- (2) Unless clause (3) (a) or (b) applies, the owner shall have an examination carried out in accordance with section 3 to establish whether any material that is likely to be handled, dealt with, disturbed or removed, whether friable or non-friable, is asbestos-containing material. O. Reg. 278/05, s. 10 (2).
- (3) An examination under subsection (2) is not required if,
- (a) the owner,
    - (i) already knows that the material is not asbestos-containing material, or
    - (ii) already knows that the material is asbestos-containing material and, in the case of sprayed-on friable material, knows the type of asbestos; or
  - (b) the work is being arranged or contracted for in accordance with this Regulation as though the material were asbestos-containing material and, in the case of sprayed-on friable material, as though it contained a type of asbestos other than chrysotile. O. Reg. 278/05, s. 10 (3).
- (4) Whether an examination is required under subsection (2) or not, the owner shall have a report prepared,
- (a) stating whether,
    - (i) the material is or is not asbestos-containing material, or
    - (ii) the work is to be performed in accordance with this Regulation as though the material were asbestos-containing material and, in the case of sprayed-on friable material, as though it contained a type of asbestos other than chrysotile;
  - (b) describing the condition of the material and stating whether it is friable or non-friable; and
  - (c) containing drawings, plans and specifications, as appropriate, to show the location of the material identified under clause (a). O. Reg. 278/05, s. 10 (4).
- (5) An owner shall give any prospective constructor a copy of the complete report prepared under subsection (4). O. Reg. 278/05, s. 10 (5).
- (6) Subsection (5) applies, with necessary modifications, with respect to,
- (a) a constructor and a prospective contractor; and
  - (b) a contractor and a prospective subcontractor. O. Reg. 278/05, s. 10 (6).
- (7) Subsections (8), (9) and (10) apply if, during work described in clause (1) (a), material is discovered that,
- (a) was not referred to in the report prepared under subsection (4); and
  - (b) may be asbestos-containing material. O. Reg. 278/05, s. 10 (7).
- (8) The constructor or employer shall immediately notify, orally and in writing,
- (a) an inspector at the office of the Ministry of Labour nearest the workplace;
  - (b) the owner;
  - (c) the contractor; and
  - (d) the joint health and safety committee or the health and safety representative, if any, for the workplace. O. Reg. 278/05, s. 10 (8).
- (9) The written notice referred to in subsection (8) shall include the information referred to in clauses 11 (3) (a) to (f). O. Reg. 278/05, s. 10 (9).
- (10) No work that is likely to involve handling, dealing with, disturbing or removing the material referred to in subsection (7) shall be done unless,
- (a) it has been determined under section 3 whether the material is asbestos-containing material; or

- (b) the work is performed in accordance with this Regulation as though the material were asbestos-containing material and, in the case of sprayed-on friable material, as though it contained a type of asbestos other than chrysotile. O. Reg. 278/05, s. 10 (10).

(11) Subsection (10) does not prohibit handling, dealing with, disturbing or removing material for the sole purpose of determining whether it is asbestos-containing material. O. Reg. 278/05, s. 10 (11).

### **ADVANCE NOTICE RE TYPE 3 OPERATIONS AND CERTAIN TYPE 2 OPERATIONS**

**11.** (1) Before commencing a Type 3 operation, the constructor, in the case of a project, and the employer, in any other case, shall notify, orally and in writing, an inspector at the office of the Ministry of Labour nearest the workplace of the operation. O. Reg. 278/05, s. 11 (1).

(2) Subsection (1) also applies with respect to a Type 2 operation described in paragraph 9 of subsection 12 (3) in which one square metre or more of insulation is to be removed. O. Reg. 278/05, s. 11 (2).

(3) The written notice required by subsection (1) shall set out,

- (a) the name and address of the person giving the notice;
- (b) the name and address of the owner of the place where the work will be carried out;
- (c) the municipal address or other description of the place where the work will be carried out sufficient to permit the inspector to locate the place, including the location with respect to the nearest public highway;
- (d) a description of the work that will be carried out;
- (e) the starting date and expected duration of the work; and
- (f) the name and address of the supervisor in charge of the work. O. Reg. 278/05, s. 11 (3).

### **TYPE 1, TYPE 2 AND TYPE 3 OPERATIONS**

**12.** (1) For the purposes of this Regulation, operations that may expose a worker to asbestos are classified as Type 1, Type 2 and Type 3 operations. O. Reg. 278/05, s. 12 (1).

(2) The following are Type 1 operations:

1. Installing or removing ceiling tiles that are asbestos-containing material, if the tiles cover an area less than 7.5 square metres and are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
2. Installing or removing non-friable asbestos-containing material, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
3. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,
  - i. the material is wetted to control the spread of dust or fibres, and
  - ii. the work is done only by means of non-powered hand-held tools.
4. Removing less than one square metre of drywall in which joint-filling compounds that are asbestos-containing material have been used. O. Reg. 278/05, s. 12 (2).

(3) The following are Type 2 operations:

1. Removing all or part of a false ceiling to obtain access to a work area, if asbestos-containing material is likely to be lying on the surface of the false ceiling.
2. The removal or disturbance of one square metre or less of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of machinery or equipment or a building, aircraft, locomotive, railway car, vehicle or ship.
3. Enclosing friable asbestos-containing material.

4. Applying tape or a sealant or other covering to pipe or boiler insulation that is asbestos-containing material.
  5. Installing or removing ceiling tiles that are asbestos-containing material, if the tiles cover an area of 7.5 square metres or more and are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
  6. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,
    - i. the material is not wetted to control the spread of dust or fibres, and
    - ii. the work is done only by means of non-powered hand-held tools.
  7. Removing one square metre or more of drywall in which joint filling compounds that are asbestos-containing material have been used.
  8. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
  9. Removing insulation that is asbestos-containing material from a pipe, duct or similar structure using a glove bag.
  10. Cleaning or removing filters used in air handling equipment in a building that has sprayed fireproofing that is asbestos-containing material.
  11. An operation that,
    - i. is not mentioned in any of paragraphs 1 to 10,
    - ii. may expose a worker to asbestos, and
    - iii. is not classified as a Type 1 or Type 3 operation. O. Reg. 278/05, s. 12 (3).
- (4) The following are Type 3 operations:
1. The removal or disturbance of more than one square metre of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of a building, aircraft, ship, locomotive, railway car or vehicle or any machinery or equipment.
  2. The spray application of a sealant to friable asbestos-containing material.
  3. Cleaning or removing air handling equipment, including rigid ducting but not including filters, in a building that has sprayed fireproofing that is asbestos-containing material.
  4. Repairing, altering or demolishing all or part of a kiln, metallurgical furnace or similar structure that is made in part of refractory materials that are asbestos-containing materials.
  5. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material, if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters.
  6. Repairing, altering or demolishing all or part of any building in which asbestos is or was used in the manufacture of products, unless the asbestos was cleaned up and removed before March 16, 1986. O. Reg. 278/05, s. 12 (4).
- (5) Work on ceiling tiles, drywall or friable asbestos-containing material is classified according to the total area on which work is done consecutively in a room or enclosed area, even if the work is divided into smaller jobs. O. Reg. 278/05, s. 12 (5).
- (6) The following provisions apply if a dispute arises as to the classification of an operation under this section:
1. A party to the dispute may notify an inspector at the office of the Ministry of Labour nearest the workplace of the dispute.
  2. The party who notifies the inspector shall promptly inform the other parties that the inspector has been notified.
  3. Work on the operation shall cease until the inspector has given a decision under paragraph 4.

4. The inspector shall, as soon as possible, investigate the matter and give the parties a decision in writing. O. Reg. 278/05, s. 12 (6).

(7) Nothing in subsection (6) affects an inspector's power to issue an order for a contravention of this Regulation. O. Reg. 278/05, s. 12 (7).

## **RESPIRATORS**

**13.** (1) A respirator provided by an employer and used by a worker in a Type 1, Type 2 or Type 3 operation,

- (a) shall be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet;
- (b) shall be assigned to a worker for his or her exclusive use, if practicable;
- (c) shall be used and maintained in accordance with written procedures that are established by the employer and are consistent with the manufacturer's specifications;
- (d) shall be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker;
- (e) shall have damaged or deteriorated parts replaced prior to being used by a worker; and
- (f) when not in use, shall be stored in a convenient, clean and sanitary location. O. Reg. 278/05, s. 13 (1).

(2) The following additional requirements apply to a respirator of the supplied air type:

- 1. The compressed air used for breathing shall meet the standards set out in Table 1 of CSA Standard Z180.1-00, Compressed Breathing Air and Systems (March, 2000).
- 2. If an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor equipped with an alarm shall be provided.
- 3. If an ambient breathing air system is used, the air intake shall be located in accordance with Appendix B of the standard referred to in paragraph 1. O. Reg. 278/05, s. 13 (2).

(3) If respirators are used in the workplace,

- (a) the employer shall establish written procedures regarding the selection, use and care of respirators; and
- (b) a copy of the procedures shall be provided to and reviewed with each worker who is required to wear a respirator. O. Reg. 278/05, s. 13 (3).

(4) A worker shall not be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator. O. Reg. 278/05, s. 13 (4).

## **MEASURES AND PROCEDURES, TYPE 1 OPERATIONS**

**14.** The following measures and procedures apply to Type 1 operations:

- 1. Before beginning work, visible dust shall be removed with a damp cloth or a vacuum equipped with a HEPA filter from any surface in the work area, including the thing to be worked on, if the dust on that surface is likely to be disturbed.
- 2. The spread of dust from the work area shall be controlled by measures appropriate to the work to be done including the use of drop sheets of polyethylene or other suitable material that is impervious to asbestos.
- 3. In the case of an operation mentioned in paragraph 4 of subsection 12 (2), the material shall be wetted before and kept wet during the work to control the spread of dust or fibres, unless wetting would create a hazard or cause damage.
- 4. A wetting agent shall be added to water that is to be used to control the spread of dust and fibres.

5. Frequently and at regular intervals during the doing of the work and immediately on completion of the work,
  - i. dust and waste shall be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a container as described in paragraph 5 of section 15, and
  - ii. drop sheets shall be wetted and placed in a container as described in paragraph 5 of section 15, as soon as practicable after subparagraph i has been complied with.
6. Drop sheets shall not be reused.
7. After the work is completed, polyethylene sheeting and similar materials used for barriers and enclosures shall not be reused, but shall be wetted and placed in a container as described in paragraph 5 of section 15 as soon as practicable after paragraph 5 of this section has been complied with.
8. After the work is completed, barriers and portable enclosures that will be reused shall be cleaned, by using a vacuum equipped with a HEPA filter or by damp wiping, as soon as practicable after paragraphs 5 and 7 have been complied with.
9. Barriers and portable enclosures shall not be reused unless they are rigid and can be cleaned thoroughly.
10. Compressed air shall not be used to clean up and remove dust from any surface.
11. Eating, drinking, chewing or smoking shall not be permitted in the work area.
12. If a worker requests that the employer provide a respirator to be used by the worker, the employer shall provide the worker with a NIOSH approved respirator in accordance with Table 2, and the worker shall wear and use the respirator.
13. If a worker requests that the employer provide protective clothing to be used by the worker, the employer shall provide the worker with protective clothing as described in paragraph 12 of section 15, and the worker shall wear the protective clothing.
14. A worker who is provided with protective clothing shall, before leaving the work area,
  - i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
  - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.
15. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area. O. Reg. 278/05, s. 14.

### **MEASURES AND PROCEDURES, TYPE 2 AND TYPE 3 OPERATIONS**

15. The following measures and procedures apply to Type 2 operations and to Type 3 operations:
  1. The work area shall be identified by clearly visible signs warning of an asbestos dust hazard.
  2. Signs required by paragraph 1 shall be posted in sufficient numbers to warn of the hazard and shall state in large clearly visible letters that,
    - i. there is an asbestos dust hazard, and
    - ii. access to the work area is restricted to persons wearing protective clothing and equipment.
  3. A wetting agent shall be added to water that is to be used to control the spread of dust and fibres.
  4. Eating, drinking, chewing or smoking shall not be permitted in the work area.
  5. Containers for dust and waste shall be,
    - i. dust tight,
    - ii. suitable for the type of waste,
    - iii. impervious to asbestos,

- iv. identified as asbestos waste,
  - v. cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before being removed from the work area, and
  - vi. removed from the workplace frequently and at regular intervals.
6. Frequently and at regular intervals during the doing of the work and immediately on completion of the work,
    - i. dust and waste shall be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a container as described in paragraph 5, and
    - ii. drop sheets shall be wetted and placed in a container as described in paragraph 5, as soon as practicable after subparagraph i has been complied with.
  7. Drop sheets shall not be reused.
  8. After the work is completed, polyethylene sheeting and similar materials used for barriers and enclosures shall not be reused, but shall be wetted and placed in a container as described in paragraph 5 as soon as practicable after paragraph 6 has been complied with.
  9. After the work is completed, barriers and portable enclosures that will be reused shall be cleaned, by using a vacuum equipped with a HEPA filter or by damp wiping, as soon as practicable after paragraphs 6 and 8 have been complied with.
  10. Barriers and portable enclosures shall not be reused unless they are rigid and can be cleaned thoroughly.
  11. The employer shall provide every worker who will enter the work area with a NIOSH approved respirator in accordance with Table 2 and the worker shall wear and use the respirator.
  12. Protective clothing shall be provided by the employer and worn by every worker who enters the work area, and the protective clothing,
    - i. shall be made of a material that does not readily retain nor permit penetration of asbestos fibres,
    - ii. shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing,
    - iii. shall include suitable footwear, and
    - iv. shall be repaired or replaced if torn.
  13. Compressed air shall not be used to clean up and remove dust from any surface.
  14. Only persons wearing protective clothing and equipment shall enter a work area where there is an asbestos dust hazard. O. Reg. 278/05, s. 15.

#### **ADDITIONAL MEASURES AND PROCEDURES, TYPE 2 OPERATIONS**

- 16.** In addition to the measures and procedures prescribed by section 15, the following measures and procedures apply to Type 2 operations:
  1. If the operation is one mentioned in paragraph 1 of subsection 12 (3), the friable material that is likely to be disturbed shall be cleaned up and removed by using a vacuum equipped with a HEPA filter when access to the work area is obtained.
  2. Before commencing work that is likely to disturb friable asbestos-containing material that is crumbled, pulverized or powdered and that is lying on any surface, the friable material shall be cleaned up and removed by damp wiping or by using a vacuum equipped with a HEPA filter.
  3. Friable asbestos-containing material that is not crumbled, pulverized or powdered and that may be disturbed or removed during the work shall be thoroughly wetted before the work and kept wet during the work, unless wetting would create a hazard or cause damage.

4. Subject to paragraph 5, the spread of dust from a work area shall be controlled by measures appropriate to the work to be done, including the use of drop sheets of polyethylene or other suitable material that is impervious to asbestos.
5. If the operation is one mentioned in paragraph 1 or 2 of subsection 12 (3) and is carried on indoors, the spread of dust from the work area shall be prevented, if practicable, by,
  - i. using an enclosure of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls,
  - ii. disabling the mechanical ventilation system serving the work area, and
  - iii. sealing the ventilation ducts to and from the work area.
6. Before leaving the work area, a worker shall,
  - i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, and
  - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.
7. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area. O. Reg. 278/05, s. 16.

#### **ADDITIONAL MEASURES AND PROCEDURES, GLOVE BAG OPERATIONS**

- 17.** In addition to the measures and procedures prescribed by sections 15 and 16, the following measures and procedures apply to Type 2 operations referred to in paragraph 9 of subsection 12 (3):
1. The work area shall be separated from the rest of the workplace by walls, barricades, fencing or other suitable means.
  2. The spread of asbestos-containing material from the work area shall be prevented by disabling the mechanical ventilation system serving the work area and sealing all openings or voids, including ventilation ducts to and from the working area.
  3. Surfaces below the work area shall be covered with drop sheets of polyethylene or other suitable material that is impervious to asbestos.
  4. The glove bag shall be made of material that is impervious to asbestos and sufficiently strong to support the weight of material the bag will hold.
  5. The glove bag shall be equipped with,
    - i. sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period,
    - ii. valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure,
    - iii. a tool pouch with a drain,
    - iv. a seamless bottom and a means of sealing off the lower portion of the bag, and
    - v. a high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
  6. A glove bag shall not be used to remove insulation from a pipe, duct or similar structure if,
    - i. it may not be possible to maintain a proper seal for any reason including, without limitation,
      - A. the condition of the insulation, or
      - B. the temperature of the pipe, duct or similar structure, or
    - ii. the bag could become damaged for any reason including, without limitation,

- A. the type of jacketing, or
  - B. the temperature of the pipe, duct or similar structure.
7. Immediately before the glove bag is attached, the insulation jacketing or coating shall be inspected for damage or defects, and if any damage or defect is present, it shall be repaired.
  8. The glove bag shall be inspected for damage or defects,
    - i. immediately before it is attached to the pipe, duct or other similar structure, and
    - ii. at regular intervals during its use.
  9. If damage or defects are observed when the glove bag is inspected under subparagraph 8 i, the glove bag shall not be used and shall be disposed of.
  10. If damage or defects are observed when the glove bag is inspected under subparagraph 8 ii or at any other time,
    - i. the use of the glove bag shall be discontinued,
    - ii. the inner surface of the glove bag and the contents, if any, shall be thoroughly wetted,
    - iii. the glove bag and the contents, if any, shall be removed and placed in a container as described in paragraph 5 of section 15, and
    - iv. the work area shall be cleaned by vacuuming with a vacuum equipped with a HEPA filter before removal work is resumed.
  11. When the removal work is completed,
    - i. the inner surface of the glove bag and the waste inside shall be thoroughly wetted and the air inside the bag shall be removed through an elasticized valve, by means of a vacuum equipped with a HEPA filter,
    - ii. the pipe, duct or similar structure shall be wiped down and sealed with a suitable encapsulant,
    - iii. the glove bag, with the waste inside, shall be placed in a container as described in paragraph 5 of section 15, and
    - iv. the work area shall be cleaned by damp wiping or by cleaning with a vacuum equipped with a HEPA filter. O. Reg. 278/05, s. 17.

#### **ADDITIONAL MEASURES AND PROCEDURES, TYPE 3 OPERATIONS**

**18.** (1) In addition to the measures and procedures prescribed by section 15, the following measures and procedures apply to Type 3 operations:

1. The work area shall be separated from the rest of the workplace by walls, the placing of barricades or fencing or other suitable means.
2. Subsection (2) applies to an operation mentioned in paragraph 5 of subsection 12 (4).
3. Subsection (3) applies to an operation mentioned in paragraph 1, 2, 3 or 4 of subsection 12 (4) that is carried on outdoors.
4. Subsection (4) applies to an operation mentioned in paragraph 1, 2, 3, 4 or 6 of subsection 12 (4) that is carried on indoors. O. Reg. 278/05, s. 18 (1).

(2) In the case of an operation mentioned in paragraph 5 of subsection 12 (4), the following measures and procedures also apply:

1. The spread of dust from the work area shall be prevented by,
  - i. using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls, and
  - ii. using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.

2. Unless the operation is carried on outdoors, or inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition, the spread of dust from the work area shall also be prevented by,
    - i. creating and maintaining within the enclosed area, by installing a ventilation system equipped with a HEPA filtered exhaust unit, a negative air pressure of 0.02 inches of water, relative to the area outside the enclosed area,
    - ii. ensuring that replacement air is taken from outside the enclosed area and is free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas, and
    - iii. using a device, at regular intervals, to measure the difference in air pressure between the enclosed area and the area outside it.
  3. The ventilation system referred to in subparagraph 2 i shall be inspected and maintained by a competent worker before each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it shall be replaced before the ventilation system is used.
  4. Before leaving the work area, a worker shall,
    - i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, and
    - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.
  5. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area. O. Reg. 278/05, s. 18 (2).
- (3) In the case of an operation mentioned in paragraph 1, 2, 3 or 4 of subsection 12 (4) that is carried on outdoors, the following measures and procedures also apply:
1. If practicable, any asbestos-containing material to be removed shall be thoroughly wetted before and during removal, unless wetting would create a hazard or cause damage.
  2. Dust and waste shall not be permitted to fall freely from one work level to another.
  3. If practicable, the work area shall be washed down with water after completion of the clean-up and removal described in paragraph 6 of section 15.
  4. Temporary electrical power distribution systems for tools and equipment involved in wet removal operations shall be equipped with ground fault circuit interrupters.
  5. A decontamination facility shall be located as close as practicable to the work area and shall consist of,
    - i. a room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment,
    - ii. a shower room as described in paragraph 7 of subsection (4), and
    - iii. a room suitable for changing into street clothes and for storing clean clothing and equipment.
  6. The rooms described in subparagraphs 5 i, ii and iii shall be arranged in sequence and constructed so that any person entering or leaving the work area must pass through each room.
  7. When leaving the work area, a worker shall enter the decontamination facility and shall, in the following order,
    - i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
    - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15,
    - iii. shower, and
    - iv. remove and clean the respirator. O. Reg. 278/05, s. 18 (3).

(4) In the case of an operation mentioned in paragraph 1, 2, 3, 4 or 6 of subsection 12 (4) that is carried on indoors, the following measures and procedures also apply:

1. Friable asbestos-containing material that is crumbled, pulverized or powdered and that is lying on any surface in the work area shall be cleaned up and removed using a vacuum equipped with a HEPA filter or by damp wiping and everything shall be removed from the work area or covered with polyethylene sheeting or other suitable material that is impervious to asbestos.
2. The spread of dust from the work area shall be prevented by an enclosure of polyethylene or other suitable material that is impervious to asbestos, if the work area is not enclosed by walls, and by a decontamination facility consisting of a series of interconnecting rooms including,
  - i. a room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment,
  - ii. a shower room as described in paragraph 7,
  - iii. a room suitable for changing into street clothes and for storing clean clothing and equipment, and
  - iv. curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted to each side of the entrance or exit to each room.
3. The rooms described in subparagraphs 2 i, ii and iii shall be arranged in sequence and constructed so that any person entering or leaving the work area must pass through each room.
4. The mechanical ventilation system serving the work area shall be disabled and all openings or voids, including ventilation ducts to or from the work area, shall be sealed by tape or other appropriate means.
5. Unless the operation is carried on inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition, the spread of dust from the work area shall also be prevented by,
  - i. creating and maintaining within the enclosed area, by installing a ventilation system equipped with a HEPA filtered exhaust unit, a negative air pressure of 0.02 inches of water, relative to the area outside the enclosed area,
  - ii. ensuring that replacement air is taken from outside the enclosed area and is free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas, and
  - iii. using a device, at regular intervals, to measure the difference in air pressure between the enclosed area and the area outside it.
6. The ventilation system referred to in subparagraph 5 i shall be inspected and maintained by a competent worker before each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it shall be replaced before the ventilation system is used.
7. The shower room in the decontamination facility shall,
  - i. be provided with hot and cold water or water of a constant temperature that is not less than 40° Celsius or more than 50° Celsius,
  - ii. have individual controls inside the room to regulate water flow and, if there is hot and cold water, individual controls inside the room to regulate temperature,
  - iii. be capable of providing adequate supplies of hot water to maintain a water temperature of at least 40° Celsius, and
  - iv. be provided with clean towels.
8. When leaving the work area, a worker shall enter the decontamination facility and shall, in the following order,
  - i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
  - ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15,

- iii. shower, and
  - iv. remove and clean the respirator.
9. If practicable, existing electrical power distribution systems that are not water-tight shall be de-energized and locked out where wet removal operations are to be carried out.
  10. Temporary electrical power distribution systems for tools and equipment involved in wet removal operations shall be equipped with ground fault circuit interrupters.
  11. Friable asbestos-containing material shall be thoroughly wetted before and during removal, unless wetting would create a hazard or cause damage.
  12. The work area shall be inspected by a competent worker for defects in the enclosure, barriers and decontamination facility,
    - i. at the beginning of each shift,
    - ii. at the end of a shift if there is no shift that begins immediately after the first-named shift, and
    - iii. at least once each day on days when there are no shifts.
  13. Defects observed during an inspection under paragraph 12 shall be repaired immediately and no other work shall be carried out in the work area until the repair work is completed.
  14. If practicable, dust and waste shall be kept wet.
  15. On completion of the work,
    - i. negative air pressure shall be maintained if required by subparagraph 5 i,
    - ii. the inner surface of the enclosure and the work area inside the enclosure shall be cleaned by a thorough washing or by vacuuming with a vacuum equipped with a HEPA filter,
    - iii. equipment, tools and other items used in the work shall be cleaned with a damp cloth or by vacuuming with a vacuum equipped with a HEPA filter or they shall be placed in a container as described in paragraph 5 of section 15 before being removed from the enclosure, and
    - iv. a visual inspection shall be conducted by a competent worker to ensure that the enclosure and the work area inside the enclosure are free from visible dust, debris or residue that may contain asbestos.
  16. Once the work area inside the enclosure is dry after the steps set out in subparagraphs 15 ii, iii and iv have been completed, clearance air testing shall be conducted by a competent worker in accordance with subsection (5), unless the operation is carried on inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition.
  17. The barriers, enclosure and decontamination facility shall not be removed or dismantled until,
    - i. cleaning has been done as described in paragraph 15, and
    - ii. if clearance air testing is required, it has been completed and the work area inside the enclosure has passed the clearance air test. O. Reg. 278/05, s. 18 (4).
- (5) The following rules apply to clearance air testing:
1. Sample collection and analysis shall be done,
    - i. using the phase contrast microscopy method, in accordance with subsection (6), or
    - ii. using the transmission electron microscopy method, in accordance with subsection (7).
  2. If the work area inside the enclosure fails the clearance air test, the steps set out in subparagraphs 15 ii, iii and iv of subsection (4) shall be repeated and the work area shall be allowed to dry before a further test is carried out, unless paragraph 6 of subsection (6) applies. O. Reg. 278/05, s. 18 (5).
- (6) Clearance air testing using the phase contrast microscopy method shall be carried out in accordance with U.S. National Institute of Occupational Safety and Health Manual of Analytical Methods, Method 7400, Issue 2: Asbestos and other Fibres by PCM (August 15, 1994), using the asbestos fibre counting rules, and shall comply with the following requirements:

1. Testing shall be based on samples taken inside the enclosure.
2. Forced air shall be used, both before and during the sampling process, to ensure that fibres are dislodged from all surfaces inside the enclosure before sampling begins and are kept airborne throughout the sampling process.
3. At least 2,400 litres of air shall be drawn through each sample filter, even though the standard mentioned above provides for a different amount.
4. The number of air samples to be collected shall be in accordance with Table 3.
5. The work area inside the enclosure passes the clearance air test only if every air sample collected has a concentration of fibres that does not exceed 0.01 fibres per cubic centimetres of air.
6. If the work area inside the enclosure fails a first test that is done using the phase contrast microscopy method, the samples may be subjected to a second analysis using transmission electron microscopy in accordance with the standard mentioned in subsection (7).
7. When a second analysis is done as described in paragraph 6, the work area inside the enclosure passes the clearance air test only if every air sample collected has a concentration of asbestos fibres that does not exceed 0.01 fibres per cubic centimetre of air. O. Reg. 278/05, s. 18 (6).

(7) Clearance air testing using the transmission electron microscopy method shall be carried out in accordance with U.S. National Institute of Occupational Safety and Health Manual of Analytical Methods, Method 7402, Issue 2: Asbestos by TEM (August 15, 1994), and shall comply with the following requirements:

1. Testing shall be based on samples taken inside the enclosure and samples taken outside the enclosure but inside the building.
  2. Forced air shall be used inside the enclosure, both before and during the sampling process, to ensure that fibres are dislodged from all surfaces before sampling begins and are kept airborne throughout the sampling process.
  3. At least 2,400 litres of air shall be drawn through each sample filter, even though the standard mentioned above provides for a different amount.
  4. At least five air samples shall be taken inside each enclosure and at least five air samples shall be taken outside the enclosure but inside the building.
  5. Sampling inside and outside the enclosure shall be conducted concurrently.
  6. The work area inside the enclosure passes the clearance air test if the average concentration of asbestos fibres in the samples collected inside the enclosure is statistically less than the average concentration of asbestos fibres in the samples collected outside the enclosure, or if there is no statistical difference between the two average concentrations. O. Reg. 278/05, s. 18 (7).
- (8) Within 24 hours after the clearance air testing results are received,
- (a) the owner and the employer shall post a copy of the results in a conspicuous place or places,
    - (i) at the workplace, and
    - (ii) if the building contains other workplaces, in a common area of the building; and
  - (b) a copy shall be provided to the joint health and safety committee or the health and safety representative, if any, for the workplace and for the building. O. Reg. 278/05, s. 18 (8).
- (9) The owner of the building shall keep a copy of the clearance air testing results for at least one year after receiving them. O. Reg. 278/05, s. 18 (9).

### **INSTRUCTION AND TRAINING**

**19.** (1) The employer shall ensure that instruction and training in the following subjects are provided by a competent person to every worker working in a Type 1, Type 2 or Type 3 operation:

1. The hazards of asbestos exposure.
2. Personal hygiene and work practices.

3. The use, cleaning and disposal of respirators and protective clothing. O. Reg. 278/05, s. 19 (1).

(2) The joint health and safety committee or the health and safety representative, if any, for the workplace shall be advised of the time and place where the instruction and training prescribed by subsection (1) are to be carried out. O. Reg. 278/05, s. 19 (2).

(3) Without restricting the generality of paragraph 3 of subsection (1), the instruction and training related to respirators shall include instruction and training related to,

- (a) the limitations of the equipment;
- (b) inspection and maintenance of the equipment;
- (c) proper fitting of a respirator; and
- (d) respirator cleaning and disinfection. O. Reg. 278/05, s. 19 (3).

**Note:** Section 20 comes into force on November 1, 2007. See: O. Reg. 278/05, s. 26 (2).

### **ASBESTOS ABATEMENT TRAINING PROGRAMS**

**20.** (1) The employer shall ensure that,

- (a) every worker involved in a Type 3 operation has successfully completed the Asbestos Abatement Worker Training Program approved by the Ministry of Training, Colleges and Universities; and
- (b) every supervisor of a worker involved in a Type 3 operation has successfully completed the Asbestos Abatement Supervisor Training Program approved by the Ministry of Training, Colleges and Universities. O. Reg. 278/05, s. 20 (1).

(2) The employer shall ensure that every worker and supervisor successfully completes the appropriate program required under subsection (1) before performing or supervising the work to which the program relates. O. Reg. 278/05, s. 20 (2).

(3) A document issued by the Ministry of Training, Colleges and Universities, showing that a worker has successfully completed a program mentioned in subsection (1), is conclusive proof, for the purposes of this section, of his or her successful completion of the program. O. Reg. 278/05, s. 20 (3).

(4) In accordance with the *Agreement on Internal Trade, 1995* and the *Protocols of Amendment*, a worker shall be deemed to hold a document showing successful completion referred to in subsection (3) if he or she has successfully completed equivalent training in another province or territory of Canada, as determined by the Director. O. Reg. 278/05, s. 20 (4).

### **ASBESTOS WORK REPORT**

**21.** (1) The employer of a worker working in a Type 2 operation or a Type 3 operation shall complete an asbestos work report in a form obtained from the Ministry for each such worker,

- (a) at least once in each 12-month period; and
- (b) immediately on the termination of the employment of the worker. O. Reg. 278/05, s. 21 (1).

(2) As soon as the asbestos work report is completed, the employer shall,

- (a) forward it to the Provincial Physician, Ministry of Labour, and
- (b) give a copy to the worker. O. Reg. 278/05, s. 21 (2).

(3) For the purposes of clause (2) (a), the employer may deliver the report to the Provincial Physician in person or send it by ordinary mail, by courier or by fax. O. Reg. 278/05, s. 21 (3).

### **ASBESTOS WORKERS REGISTER**

**22.** (1) The Provincial Physician, Ministry of Labour, shall establish and maintain an Asbestos Workers Register listing the name of each worker for whom an employer submits an asbestos work report under section 21. O. Reg. 278/05, s. 22 (1).

(2) On the recommendation of the Provincial Physician, a worker who is listed in the Register may volunteer to undergo the prescribed medical examination described in paragraph 1 of subsection (4). O. Reg. 278/05, s. 22 (2).

(3) A worker who has undergone the prescribed medical examination described in paragraph 1 of subsection (4) may volunteer to undergo subsequent examinations of the same type if they are recommended by his or her physician. O. Reg. 278/05, s. 22 (3).

(4) The following medical examinations are prescribed for the purposes of subsection 26 (3) of the Act:

1. An examination consisting of a medical questionnaire, chest x-rays and pulmonary function tests.
2. A subsequent examination that consists of the components described in paragraph 1, is recommended by the worker's physician and takes place at least two years after the most recent examination. O. Reg. 278/05, s. 22 (4).

(5) A worker who is removed from exposure to asbestos because an examination discloses that he or she may have or has a condition resulting from exposure to asbestos and suffers a loss of earnings as a result of the removal from exposure to asbestos is entitled to compensation for the loss in the manner and to the extent provided by the *Workplace Safety and Insurance Act, 1997*. O. Reg. 278/05, s. 22 (5).

### USE OF EQUIVALENT MEASURE OR PROCEDURE

**23.** A constructor, in the case of a project, or the employer, in any other case, may vary a measure or procedure required by this Regulation if the following conditions are satisfied:

1. The measure or procedure, as varied, affords protection for the health and safety of workers that is at least equal to the protection that would be provided by complying with this Regulation.
2. The constructor or employer gives written notice of the varied measure or procedure, in advance, to the joint health and safety committee or the health and safety representative, if any, for the workplace. O. Reg. 278/05, s. 23.

### NOTICE TO INSPECTOR

**24.** (1) When this Regulation requires written notice to an inspector at an office of the Ministry of Labour, the notice shall be given,

- (a) by delivering it to the office in person;
- (b) by sending it by ordinary mail, by courier or by fax, or
- (c) by sending the notice to the inspector by electronic means that are acceptable to the Ministry. O. Reg. 278/05, s. 24 (1).

(2) When this Regulation requires oral notice to an inspector at an office of the Ministry of Labour, the notice shall be given,

- (a) in person;
- (b) by telephoning the inspector; or
- (c) by sending the notice to the inspector by electronic means that are acceptable to the Ministry. O. Reg. 278/05, s. 24 (2).

**25.** OMITTED (REVOKES OTHER REGULATIONS). O. Reg. 278/05, s. 25.

**26.** OMITTED (PROVIDES FOR COMING INTO FORCE OF PROVISIONS OF THIS REGULATION). O. Reg. 278/05, s. 26.

**TABLE 1: BULK MATERIAL SAMPLES***Subsection 3 (3)*

<b>Item</b>	<b>Type of material</b>	<b>Size of area of homogeneous material</b>	<b>Minimum number of bulk material samples to be collected</b>
1.	Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise, such as acoustical plaster on ceilings and fireproofing materials on structural members	Less than 90 square metres	3
		90 or more square metres, but less than 450 square metres	5
		450 or more square metres	7
2.	Thermal insulation, except as described in item 3	any size	3
3.	Thermal insulation patch	Less than 2 linear metres or 0.5 square metres	1
4.	Other material	Any size	3

O. Reg. 278/05, Table 1.

**TABLE 2: RESPIRATORS**

*Paragraph 12 of section 14 and paragraph 11 of section 15*

<b>Work Category</b>		<b>Required respirator</b>
<b>Type 1 Operations</b>		
Worker requests that the employer provide a respirator to be used by the worker, as described in paragraph 12 of section 14		Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter
<b>Type 2 Operations</b>		
Work described in paragraph 1 of subsection 12 (3)		One of the following: <ul style="list-style-type: none"> <li>- Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter</li> <li>- Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter</li> <li>- Negative pressure (demand) supplied air respirator equipped with a full-facepiece</li> <li>- Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</li> </ul>
Work described in paragraphs 2 to 7 and 9 to 11 of subsection 12 (3)		Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter
Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable material containing asbestos by means of power tools, if the tool is attached to a dust collecting device equipped with a HEPA filter as described in paragraph 8 of subsection 12 (3)	Material is not wetted	One of the following: <ul style="list-style-type: none"> <li>- Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter</li> <li>- Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter</li> <li>- Negative pressure (demand) supplied air respirator equipped with a full-facepiece</li> <li>- Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</li> </ul>
	Material is wetted to control spread of fibre	Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter
<b>Type 3 Operations</b>		
Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable material containing asbestos by means of power tools, if the tool is not attached to a dust collecting device equipped with a HEPA filter as described in paragraph 5 of subsection 12 (4)	Material is not wetted	Pressure demand supplied air respirator equipped with a half mask
	Material is wetted to control spread of fibre	One of the following: <ul style="list-style-type: none"> <li>- Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter</li> <li>- Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter</li> <li>- Negative pressure (demand) supplied air respirator equipped with a full-facepiece</li> <li>- Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</li> </ul>

Work with friable material containing asbestos, as described in paragraphs 1 to 4 and 6 of subsection 12 (4)	Material is not wetted	Pressure demand supplied air respirator equipped with a full facepiece
Work with friable material, as described in paragraphs 1 to 4 and 6 of subsection 12 (4), that contains a type of asbestos other than chrysotile	Material was applied or installed by spraying, and is wetted to control spread of fibre	Pressure demand supplied air respirator equipped with a half mask
Work with friable material, as described in paragraphs 1 to 4 and 6 of subsection 12 (4), that contains only chrysotile asbestos		One of the following: <ul style="list-style-type: none"> <li>- Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter</li> <li>- Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter</li> <li>- Negative pressure (demand) supplied air respirator equipped with a full-facepiece</li> <li>- Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</li> </ul>
Work with friable material containing asbestos, as described in paragraphs 1 to 4 and 6 of subsection 12 (4)	Material was not applied or installed by spraying, and is wetted to control spread of fibre	One of the following: <ul style="list-style-type: none"> <li>- Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter</li> <li>- Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter</li> <li>- Negative pressure (demand) supplied air respirator equipped with a full-facepiece</li> <li>- Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</li> </ul>

O. Reg. 278/05, Table 2.

**TABLE 3: AIR SAMPLES**

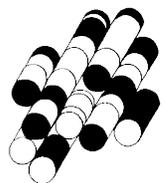
*Paragraph 4 of subsection 18 (6)*

<b>Minimum number of air samples to be taken from each enclosure</b>	<b>Area of enclosure</b>
2	10 square metres or less
3	More than 10 but less than 500 square metres
5	500 square metres or more

O. Reg. 278/05, Table 3.

# APPENDIX D

**TERRAPROBE INC.**



**GUIDELINE**

**LEAD ON CONSTRUCTION  
PROJECTS**

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## Foreword

This Guideline has been prepared to assist persons, such as employers, construction project owners, constructors, contractors and subcontractors, who have duties under the Occupational Health and Safety (OHS) and its regulations to protect workers from exposure to lead. It should not be taken to be a statement of the law or what is necessary to comply with the law. A person with legal duties may or may not agree with the Guideline and there is no legal requirement to follow the Guideline. It is for each such person to decide what is necessary to comply with the OHS and its regulations.

A person who needs assistance in determining what constitutes compliance should consult with his or her legal advisor. Ministry inspectors will assess workplace situations against the relevant provisions of the OHS and its regulations but they do not enforce the Guideline, although they may refer to it in determining whether the relevant laws have been complied with.

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## 1.0 INTRODUCTION

### Scope

Employers have a duty to protect their workers from lead exposure on construction projects. This guideline has been prepared to raise the awareness of employers and workers in the construction industry of the hazards posed by lead in construction and the measures and procedures that should be taken to control those hazards.

For the purpose of this guideline, lead refers to inorganic lead.

### Lead in Construction

Lead is a heavy metal that has been in industrial use for thousands of years. It is pale silvery grey when freshly cut but it darkens on exposure to air. It is heavy, malleable, and a poor conductor of electricity. Lead may be used in its pure elemental form or combined chemically with other elements to form lead compounds. Inorganic lead compounds are used in pigments, paints, glasses, plastics and rubber compounds.

Lead can be present on construction projects in two distinct ways:

- It can be found in construction materials, such as paints, coatings, mortar, concrete, solder, and sheet metal.
- It can be present at a construction site in existing structures, building components, and where lead was previously used in a manufacturing process.

Construction activities of particular concern include:

- abrasive blasting of structures coated with lead-based paints
- application or removal of lead-containing paints
- welding, burning, or high temperature cutting of lead-containing coatings or materials
- removal of lead-containing dust using an air mist extraction system
- removal of lead-containing mortars using an electric or pneumatic cutting device.

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## 2.0 LEGAL REQUIREMENTS

### Occupational Health and Safety Act (the OHSA)

The OHSA sets out, in very general terms, the duties of employers and others to protect workers from health and safety hazards on the job. These duties include:

- taking all reasonable precautions to protect the health and safety of workers [clause 25(2)(h)]
- ensuring that equipment, materials and protective equipment are maintained in good condition [clause 25(1)(b)]
- providing information, instruction and supervision to protect worker health and safety [clause 25(2)(a)]
- acquainting a worker or a person in authority over a worker with any hazard in the work and in the handling, storage, use, disposal and transport of any article, device, equipment or a biological, chemical or physical agent [clause 25(2)(d)].

In addition, section 30 of the OHSA deals with the presence of designated substances on construction projects. Since lead is a designated substance (O. Reg. 490/09), compliance with the OHSA and its Regulations will require some action to be taken where there is a lead hazard on a construction project.

Section 30 requires the owner of a project to determine if lead is present on a project and, if it is, to so inform all potential contractors as part of the bidding process. In a similar way, contractors who receive this information are to pass it onto other contractors and subcontractors who are bidding for work on the project. If the owner or any contractor fails to comply with this requirement, they will be liable for any loss or damages that result from a contractor subsequently discovering that lead is present.

### Workplace Hazardous Materials Information System (WHMIS) Regulation, R.R.O. 1990, Reg. 860

The WHMIS Regulation applies to all workplaces covered by the OHSA. Any employer or constructor who uses WHMIS controlled products is required to comply with the WHMIS Regulation (Reg. 860) regarding the requirements for labels, material safety data sheets, and worker education and training.

The Ministry of Labour is responsible for the administration and enforcement of both federal and provincial WHMIS legislation.

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## **Regulation for Construction Projects. O. Reg. 213/91**

The Regulation for Construction Projects, O. Reg. 213/91, applies to all construction projects. Although lead is not mentioned specifically, the following sections of the O. Reg. 213/91 would apply to situations where there is the potential for workers to be exposed to lead:

- Clause 14 (5) A competent person shall perform tests and observations necessary for the detection of hazardous conditions on a project.
- Section 21 (1) A worker shall wear such protective clothing and use such personal protective equipment or devices as are necessary to protect the worker against the hazards to which the worker may be exposed.
- (2) A worker's employer shall require the worker to comply with subsection (1).
- (3) A worker required to wear personal protective clothing or use personal protective equipment or devices shall be adequately instructed and trained in the care and use of the clothing, equipment or device before wearing or using it.
- Section 30 Workers who handle or use...substances likely to endanger their health shall be provided with washing facilities with clean water, soap and individual towels.
- Section 46 (1) A project shall be adequately ventilated by natural or mechanical means,
- (a) if a worker may be injured by inhaling a noxious...dust or fume;
- (2) If it is not practicable to provide natural or mechanical ventilation in the circumstances described in clause (1)(a), respiratory protective equipment suitable for the hazard shall be provided and be used by the workers.
- Section 59 If the dissemination of dust is a hazard to a worker, the dust shall be adequately controlled or each worker who may be exposed to the hazard shall be provided with adequate personal protective equipment.

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### **Regulation for Designated Substances, O. Reg. 490/09**

The Ministry's Designated Substance Regulation, O. Reg. 490/09, specifies occupational exposure limits (OELs) for 11 designated substances including lead, and requires assessment and a control program to ensure compliance with these OELs. The OEL for inorganic lead is 0.05 milligrams per cubic metre (mg/m<sup>3</sup>) of air as an 8-hour daily or 40-hour weekly time-weighted average limit.

Although O. Reg. 490/09 and the OEL for lead do not apply to an employer on a construction project or to their workers at the project, employers still have a responsibility to protect the health of their workers and to comply with the OHSA and other applicable regulations. Section 25(2)(h) of the OHSA requires that employers take "every precaution reasonable in the circumstances for the protection of a worker".

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### 3.0 HEALTH EFFECTS

#### How lead enters the body – what are the routes of entry?

Two routes of entry are of major concern: inhalation and ingestion. Airborne lead particles in the form of fumes, dusts and mists can be inhaled deeply into the lungs if they are small enough, less than five micrometres ( $\mu\text{m}$ ), i.e., five one-millionths of a meter. Larger particles are trapped in the upper respiratory tract, cleared from the lungs, and subsequently swallowed. You can also swallow lead dust if it gets in your food or drinks, or if you eat or smoke without washing your hands first.

#### What happens when lead enters the body – what are the health effects?

Shortly after lead is inhaled or ingested, it can enter the bloodstream and travel to soft tissues (such as the liver, kidneys, lungs, brain, spleen, muscles, and heart). After several weeks, most of the lead moves into your bones and teeth and can be stored there for a long time. Therefore, exposure to small amounts of lead can build up over time, and the more lead you have in your body, the more likely it is that you will experience health problems.

Early signs of lead poisoning include:

- tiredness
- irritability
- muscle and joint pain
- headaches
- stomach aches and cramps.

Harmful effects can follow a high exposure over a short period of time (**acute poisoning**), or long-term exposure to lower doses (**chronic poisoning**). Symptoms of acute lead poisoning include a metallic taste in the mouth and gastrointestinal symptoms such as vomiting, abdominal cramps, constipation, and diarrhea. Symptoms of chronic lead poisoning are more difficult to recognize because they are similar to many common complaints. However, severe chronic poisoning can lead to more characteristic symptoms, such as a blue line on the gums, wrist drop (the inability to hold the hand extended), severe abdominal pain and pallor.

Lead can also cause serious damage to a number of systems in the body. Overexposure to lead can affect:

**Blood:** Lead can interfere with the body's ability to manufacture hemoglobin, the molecule in red blood cells responsible for carrying oxygen to the tissues. This may lead to anemia.

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**Kidneys:** Kidneys purify blood before it is distributed for use by the rest of the body. However, kidneys are not effective in filtering lead from the bloodstream. In addition, lead can damage the kidneys and reduce its ability to filter waste from the bloodstream.

**Gastrointestinal System:** Lead poisoning may result in abdominal pain, loss of appetite, vomiting, nausea, constipation or diarrhea.

**Nervous System:** Lead poisoning can cause peripheral nerve damage that results in muscle weakness. It may also lead to behavioural changes and to impairment of vision and hearing. At very high levels, lead can affect the brain, causing convulsions, coma, and even death.

**Reproductive System:** Lead may harm the developing fetus because of the shared blood supply between a mother and her fetus. Exposure of pregnant women to excessive lead may result in miscarriages and stillbirths. Overexposure to lead in men can impair sperm production.

**Bones and Teeth:** Absorbed lead can be deposited and stored in mineralizing tissues (bones and teeth) for a long period of time. Under certain circumstances, the release of stored lead increases and can re-enter the blood and target other systems in the body. The release of stored lead increases during periods of pregnancy, lactation, menopause, physiologic stress, chronic disease, hyperthyroidism, kidney disease, broken bones, and advanced age, and is exacerbated by calcium deficiency.

Although there are many possible symptoms, they should not be relied upon to warn of a lead-exposure problem because some changes take a long time to develop and workers may not notice a change in their health. If workers carry lead-containing dust home on their clothes, footwear, skin or hair, their family can be exposed to lead too. Children in particular are more susceptible to the harmful effects of lead. Even low-level exposures may harm the intellectual development, behaviour, size and hearing of infants. The best approach in preventing lead poisoning is to ensure that proper lead-exposure controls are in place before any health problems are noted.

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## 4.0 CONTROLLING THE LEAD HAZARD

Lead may affect the health of workers if it is in a form that may be inhaled (i.e. airborne particles) or ingested. In order for lead to be a hazard by inhalation, lead particles that are small enough to be inhaled must get into the air. There are three types of particles: dust, fume and mist. Lead dust consists of solid particles created through processes such as blasting, sanding, grinding, and electric or pneumatic cutting. Lead fumes are produced when lead or lead-contaminated materials are heated to temperatures above 500 °C, such as welding, high temperature cutting, and burning operations. The heating causes a vapour to be given off and the vapour condenses into solid fume particles. Mists are made up of liquid droplets suspended in air. The spray application of lead-based paint can generate a high concentration of lead-containing mist.

The strategy for controlling airborne lead hazard can therefore be broken down into three basic approaches:

- prevent lead from getting into the air
- remove lead present in the air
- if present in the air, prevent workers from inhaling it.

To prevent the ingestion of lead, workers should exercise good work and hygiene practices.

To avoid the ingestion, inhalation and unintentional transfer of lead from contaminated areas, it is essential to have the following control methods in place:

- engineering controls
- work practices and hygiene practices
- protective clothing and equipment
- training.

Even with appropriate measures to control lead, some workers may still be affected. For this reason, periodic medical examinations are important for determining if the control measures in place are effective and if workers are suffering from the effects of lead exposure. This is known as medical surveillance (see Appendix 1) and can be considered to be a method for early detection and prevention of lead poisoning.

### **4.1 Engineering Controls**

Workplace parties, which include owners, constructors, contractors, supervisors and workers, involved in construction projects that may expose workers to lead should:

- 
- Substitute lead-containing coatings and materials with lead-free coatings and materials (e.g. substitute lead-containing paints with non-lead based paints). This may also apply to those who develop specifications.
  - Select methods and equipment for the removal or installation of lead-containing coatings and materials that will reduce dust generation (e.g. wet methods, such as wet sweeping and shovelling, reduce dust generation and should be used whenever practicable). This may also apply to those who develop the specifications.
  - General mechanical ventilation should be provided to remove contaminated air from the workplace, and filtered air should be provided to replace the exhausted air.
  - Local mechanical ventilation should be provided to remove contaminants at the source. This is the most effective method. Power tools that can generate lead-containing dust should be equipped with effective dust collection systems.

#### **4.2 Work Practices and Hygiene Practices**

Work practices and hygiene practices are on-the-job activities that reduce the exposure potential. Lead-containing material can accumulate on the hands, clothing and hair. From there it can be disturbed, re-suspended in air and inhaled or ingested. Workers should therefore be able to wash and shower at the end of each shift. The specific washing and decontamination facilities that should be provided for the most hazardous work are described in Section 6 of this guideline. For all work involving lead exposure, there should be no smoking, eating, drinking or chewing in contaminated areas. Food and beverages should be stored in an uncontaminated area.

An effective housekeeping program requires the regular cleanup removal of lead-containing dust and debris. Surfaces should be kept clean by washing down with water or vacuuming with a vacuum equipped with a high efficiency particulate air (HEPA) filter. Containers of lead-containing waste should be kept tightly covered to prevent dust from becoming airborne. Cleaning with compressed air or dry sweeping should be avoided.

#### **4.3 Protective Clothing and Equipment**

Personal protective clothing and equipment should be provided where workers may be exposed to lead. Appropriate personal protective clothing and equipment to prevent skin contamination, include but are not limited to coveralls or full-body work clothing; gloves, hats, and footwear or disposable coverlets; and safety glasses, face shields or goggles. Respirators should be provided to prevent the inhalation of lead where engineering controls and work practices do not control the concentration of lead to below the OEL.

##### **Protective Clothing**

The purpose of protective clothing is to prevent skin exposure and the contamination of regular clothing. All clothing and equipment that has been worn in a lead-contaminated area must be

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removed at the end of each shift and be decontaminated. Under no circumstances should these be taken home. When handling lead-contaminated clothing avoid shaking, as this can be a significant source of exposure to lead dust. Lead-contaminated clothing and equipment should be placed in sealed impermeable plastic bags with proper labels indicating lead contamination. Washing facilities and procedures must be suitable for handling lead contaminated laundry.

## **Respirators**

Where engineering controls and work practices do not control the concentration of lead to below the OEL, workers should wear respirators. If respirators are used, a respirator program should be implemented. The program should be developed in consultation with the joint health and safety committee or health and safety representative, if there is one, and should include written procedures for the selection, use, care and maintenance of personal respiratory protective equipment. Workers should be instructed and trained on the care and use of personal protective equipment before using it. Some workers may have a medical condition that causes them to have difficulty breathing when wearing a respirator. If such workers have written medical proof of their condition, they should not be required to do work that requires a respirator.

### Respirator selection

Where respirators are provided, they should be appropriate in the circumstances for the anticipated concentrations of airborne lead. Respirators should be selected in accordance with the U.S. National Institute for Occupational Safety and Health (NIOSH) assigned protection factors (APF).

### Use, Care, and Maintenance of Respirators

The following general use, care, and maintenance procedures should be followed whenever respirators are required:

- respirators should be used and maintained in accordance with the manufacturer's specifications
- storage of respirators should be in a convenient, clean and sanitary location and in a manner that does not subject them to damage or distortion
- respirators assigned for the exclusive use of one worker, should be cleaned, disinfected and inspected after each shift on which they are used
- respirators used by more than one worker, should be cleaned, disinfected and inspected after each use
- any respirator parts that are damaged or that have deteriorated should be replaced before the respirator is used
- please refer to CSA standard Z94.4-02 for additional information of the use and care of respirators.

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Ideally respirators should be assigned for the exclusive use of one worker. But before a decision is made for a respirator to be shared by more than one worker, the following factors should be considered:

- the fit of the equipment
- the health and safety risk to the worker that supplying non-exclusive use equipment would cause
- any undue economic hardship to the employer that supplying exclusive use equipment would cause.

Respirators with a tight-fitting face-piece, must be fitted to the worker in such a way that there is an effective seal between the equipment and the worker's face. Each worker must be fitted for each type of respirator to be worn.

#### **4.4 Training**

Training is an important component in preventing worker exposure to lead. Control methods, measures and procedures can only be as effective as the workers carrying them out. It is therefore essential for training to cover the following:

- WHMIS training,
- the hazards of lead, including health effects and symptom recognition,
- personal hygiene, respirator requirements, and work measures and procedures, and
- the use, cleaning and disposal of respirators and protective equipment;

Instruction and training should be provided by a competent person. This could be the employer or someone hired by the employer. A competent person is defined under the OHS Act as a person who:

- is qualified because of his/her knowledge, training and experience to organize and carry out the work safely;
- is familiar with the provisions of the act and the regulations that apply to the work; and
- has knowledge of any potential health and safety hazards in the workplace.

The health and safety representative or the representative of a joint health and safety committee should be advised about when and where the training and instruction is to be carried out.

#### **4.5 Medical Surveillance**

Medical surveillance can be used as a preventive measure. By providing regular medical examinations and biological monitoring (i.e. blood-lead tests) on workers exposed to lead, subsequent adverse health effects can be detected. The examining physician can then alert the

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worker, the employer and the joint health and safety committee to exposure problems in the workplace that might otherwise go unrecognized

Workers working with lead on a regular basis should have pre-placement medical examinations that include blood-lead tests, followed by periodic medical examinations. Blood-lead tests should be taken every six months, or more frequently at the discretion of a physician. Additional information of the medical surveillance program for lead exposed workers can be found in Appendix 1.

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## 5.0 CLASSIFICATION OF WORK

A key feature of this guideline is the classification of work. It is the classification of the work that determines the appropriate respirators, measures and procedures that should be followed to protect the worker from lead exposure. In this guideline, lead-containing construction operations are classified into three groups, Type 1, Type 2, and Type 3 operations, and can be thought of as being of low, medium and high risk. Some groups, Type 2 and Type 3, are further subdivided. From Type 1 to Type 3 operations, the corresponding respirator requirements, and measures and procedures become increasingly stringent.

The classification of typical lead-containing construction tasks is based on presumed airborne concentrations obtained from the U.S. Occupational Safety and Health Administration (OSHA), the Ontario Ministry of Labour, and published research studies. The classification of Type 1, Type 2, or Type 3 operations are grouped based on the following concentrations of airborne lead:

TYPE 1 OPERATIONS	TYPE 2 OPERATIONS		TYPE 3 OPERATIONS	
	Type 2a	Type 2b	Type 3a	Type 3b
< 0.05 mg/m <sup>3</sup>	> 0.05 to 0.50 mg/m <sup>3</sup>	> 0.50 to 1.25 mg/m <sup>3</sup>	> 1.25 to 2.50 mg/m <sup>3</sup>	> 2.50 mg/m <sup>3</sup>

### TYPE 1 OPERATIONS

- Application of lead-containing coatings with a brush or roller.
- Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap.
- Removal of lead-containing coatings or materials using a power tool that has an effective\* dust collection system equipped with a HEPA filter.
- Installation or removal of lead-containing sheet metal.
- Installation or removal of lead-containing packing, babbitt or similar material.
- Removal of lead-containing coatings or materials using non-powered hand tools, other than manual scraping or sanding.
- Soldering.

\* Effective implies that the dust collection system should be capable of controlling airborne lead concentration levels to below 0.05 mg/m<sup>3</sup>. Employers should follow manufacturer's recommendations and maintenance specifications for optimal function.

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## **TYPE 2 OPERATIONS**

### **TYPE 2a OPERATIONS**

- Welding or high temperature cutting of lead-containing coatings or materials outdoors. This operation is considered a Type 2a operation only if it is short-term, not repeated, and if the material has been stripped prior to welding or high temperature cutting. Otherwise, it will be considered a Type 3a operation.
- Removal of lead-containing coatings or materials by scraping or sanding using non-powered hand tools.
- Manual demolition of lead-painted plaster walls or building components by striking a wall with a sledgehammer or similar tool.

### **TYPE 2b OPERATIONS**

- Spray application of lead-containing coatings.

## **TYPE 3 OPERATIONS**

### **TYPE 3a OPERATIONS**

- Welding or high temperature cutting of lead-containing coatings or materials indoors or in a confined space.
- Burning of a surface containing lead.
- Dry removal of lead-containing mortar using an electric or pneumatic cutting device.
- Removal of lead-containing coatings or materials using power tools without an effective dust collection system equipped with a HEPA filter.
- Removal or repair of a ventilation system used for controlling lead exposure.
- Demolition or cleanup of a facility where lead-containing products were manufactured.
- An operation that may expose a worker to lead dust, fume or mist that is not a Type 1, Type 2, or Type 3b operation.

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### **TYPE 3b OPERATIONS**

- Abrasive blasting of lead-containing coatings or materials.
- Removal of lead-containing dust using an air mist extraction system.

Employers, supervisors, and workers should be able to recognize and classify lead-containing operations in order to provide appropriate respirators, measures and procedures. Respirator requirements are listed in Table 1 for Type 1, Type 2, and Type 3 operations.

**TABLE 1: RESPIRATOR REQUIREMENTS**

Operations	Required Respirator
<b>Type 1</b> (0 - 0.05 mg/m <sup>3</sup> )	
<ul style="list-style-type: none"> <li>• Application of lead-containing coatings with a brush or roller.</li> <li>• Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap.</li> <li>• Removal of lead-containing coatings or materials using a power tool that has an effective dust collection system equipped with a HEPA filter.</li> <li>• Installation or removal of lead-containing sheet metal.</li> <li>• Installation or removal of lead-containing packing, babbitt or similar material.</li> <li>• Removal of lead-containing coatings or materials with a non-powered hand tool, other than manual scraping and sanding.</li> <li>• Soldering.</li> </ul>	<p>Respirators should not be necessary if the general procedures listed in Section 6.1 are followed and if the level of lead in the air is less than 0.05 mg/m<sup>3</sup>. However, if the worker wishes to use a respirator, a half-mask particulate respirator with N-, R- or P-series filter, and 95, 99 or 100% efficiency should be provided.</p>
<b>Type 2a</b> (0.05 to 0.50 mg/m <sup>3</sup> )	<b>NIOSH APF = 10</b>
<ul style="list-style-type: none"> <li>• Welding or high temperature cutting of lead-containing coatings or materials outdoors. This operation is considered a Type 2a operation only if it is short-term, not repeated, and if the material has been stripped prior to welding or high temperature cutting. Otherwise, it will be considered a Type 3a operation.</li> <li>• Removal of lead-containing coatings or materials by scraping or sanding using non-powered hand tools.</li> <li>• Manual demolition of lead-painted plaster walls or building components by striking a wall with a sledge hammer or similar tool.</li> </ul>	<p>Half-mask particulate respirator with N-, R- or P-series filter, and 95, 99 or 100% efficiency.</p>
<b>Type 2b</b> (0.50 mg/m <sup>3</sup> to 1.25 mg/m <sup>3</sup> )	<b>NIOSH APF = 25</b>
<ul style="list-style-type: none"> <li>• Spray application of lead-containing coatings.</li> </ul>	<p>Powered air purifying respirator equipped with a hood or helmet, and any type of high efficiency filter.</p> <p>Supplied air respirator equipped with a hood or helmet and operated in a continuous flow mode.</p>

Operations	Required Respirator
<b>Type 3a</b> (1.25 to 2.50 mg/m <sup>3</sup> )	<b>NIOSH APF = 50</b>
<ul style="list-style-type: none"> <li>• Welding or high temperature cutting of lead-containing coatings or materials indoors or in a confined space.</li> <li>• Burning of a surface containing lead.</li> <li>• Dry removal of lead-containing mortar using an electric or pneumatic cutting device</li> <li>• Removal of lead-containing coatings or materials using power tools without an effective dust collection system equipped with a HEPA filter.</li> <li>• Removal or repair of a ventilation system used for controlling lead exposure.</li> <li>• Demolition or cleanup of a facility where lead-containing products were manufactured.</li> <li>• An operation that may expose a worker to lead dust, fume or mist that is not a Type 1, Type 2 or Type 3b operation.</li> </ul>	<p>Full-facepiece air-purifying respirator with N-, R- or P-series filter, and 100% efficiency.</p> <p>Tight-fitting powered air-purifying respirator with a high efficiency filter.</p> <p>Full-facepiece supplied-air respirator operated in demand mode.</p> <p>Half-mask or full-facepiece supplied air respirator operated in continuous-flow mode.</p>
<b>Type 3b</b> (more than 2.50 mg/m <sup>3</sup> )	<b>NIOSH APF ≥ 1000</b>
<ul style="list-style-type: none"> <li>• Abrasive blasting of lead-containing coatings or materials.</li> </ul>	<p>Type CE abrasive-blast supplied respirator operated in a positive pressure mode with a tight-fitting half-mask facepiece.</p>
<ul style="list-style-type: none"> <li>• Removal of lead-containing dust using an air mist extraction system.</li> </ul>	<p>Full-facepiece supplied-air respirator operated in pressure-demand or other positive-pressure mode.</p>

\* NIOSH APF = National Institute of Occupational Safety and Health Assigned Protection Factor

Note: It is recommended that compressed air used to supply air respirators should meet the breathing air purity requirement of CSA Standard Z180.1-00. Where an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor/alarm must be provided.

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## 6.0 MEASURES AND PROCEDURES FOR WORKING WITH LEAD

Protective measures and procedures should be implemented when working with lead. Specific measures and procedures will depend on how the work is classified. This section of the guideline outlines general measures and procedures for all work with lead, followed by specific recommendations for Type 1, Type 2, and Type 3 operations.

### 6.1 General Measures and Procedures for Type 1, Type 2, and Type 3 Operations

The following is a list of general measures and procedures that should be followed for all work with lead:

- washing facilities consisting of a wash basin, water, soap and towels should be provided and workers should use these washing facilities before eating, drinking, smoking or leaving the project;
- workers should not eat, drink, chew gum or smoke in the work area;
- drop sheets should be used below all lead operations which produce or may produce dust, chips, or debris containing lead;
- dust and waste should be cleaned up and removed by vacuuming with a HEPA filter equipped vacuum;
- clean-up after each operation should be done to prevent lead contamination and exposure to lead;
- dust and waste should be cleaned up at regular intervals and placed in a container that is:
  - dust tight
  - identified as containing lead waste
  - cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before being removed from the work area
  - removed from the workplace frequently and at regular intervals;
- the work area should be inspected daily at least once to ensure that the work area is clean; and
- compressed air or dry sweeping should not be used to clean up any lead-containing dust or waste from a work area or from clothing.

### 6.2 Measures and Procedures for Type 1 Operations

Respirators should not be necessary if the general procedures (above) are followed. However, any worker who requests a respirator should be provided with a half-mask particulate respirator with N-, R- or P-series filter, and 95, 99 or 100% efficiency.

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## **6.3 Measures and Procedures for Type 2 Operations**

### Preparation of the Work Area

For all Type 2 operations, signs should be posted in sufficient numbers to warn of the lead hazard. There should be a sign, at least, at each entrance to the work area. The signs should display the following information in large, clearly visible letters:

1. There is a lead dust, fume or mist hazard.
2. Access to the work area is restricted to authorized persons.
3. Respirators must be worn in the work area.

### Personal Protective Clothing and Equipment

Suitable protective clothing and equipment, as recommended in Section 4.3, should be worn by every worker who enters the work area.

Where lead-containing paints or coatings are being applied by spraying, all workers in the work area should wear a powered air purifying respirator equipped with a hood or helmet and a high efficiency filter, or a supplied air respirator equipped with a hood or helmet and operated in a continuous flow mode should be adequate.

For all other Type 2 operations, a half-mask particulate respirator with N-, R- or P-series filter, and 95, 99 or 100% efficiency should be adequate.

## **6.4 Measures and Procedures for Type 3 Operations**

### **6.4.1 Preparation of the Work Area**

Warning signs should be provided for all Type 3 operations. Signs should be posted in sufficient numbers to warn of the lead hazard, and at least at each entrance of the work area. The signs should display the following information in large, clearly visible letters:

1. There is lead dust, fume or mist hazard.
2. Access to the work area is restricted to authorized persons.
3. Respirators must be worn in the work area.

### **6.4.2 Barriers, Partial Enclosures and Full Enclosures**

Barriers, partial enclosures, and full enclosures are used to separate the work area from the rest of the project, and in some cases, to prevent lead exposure to other workers not directly involved in the operation. Partial and full enclosures can also prevent or reduce the dispersion of lead into the surrounding work area and environment. Barriers should only be used where full and partial enclosures are not practicable.

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## **Barriers**

Ropes or barriers do not prevent the release of contaminated dust or other contaminants into the environment. However, they can be used to restrict access of workers who are not adequately protected with proper PPE, and also prevent the entry of workers not directly involved in the operation. Ropes or barriers should be placed at a distance far enough from the operation that allows the lead-containing dust to settle. If this is not achievable, warning signs should be posted at the distance where the lead-containing dust settles to warn that access is restricted to persons wearing PPE. For example, the removal of mortar and cutting operations, ropes or barriers should be located at least 10 metres away. All workers within the barrier or warning sign zone must be adequately protected.

## **Partial Enclosures**

Partial enclosures allow some emissions to the atmosphere outside of the enclosure. Partial enclosures may consist of vertical tarps and floor tarps so long as the tarps are overlapped and securely fixed together at the seams. A partial enclosure is not a recommended containment system if significant dust is being generated.

## **Full Enclosures**

Full enclosures are tight enclosures (with tarps that are generally impermeable and fully sealed joints and entryways). Full enclosures allow minimal or no fugitive emissions to reach the outside environment. For full enclosures, the following requirements should be met:

- the enclosure should be made of windproof materials that are impermeable to dust
- the enclosure should be supported by a secure structure
- all joints in the enclosure should be fully sealed
- entrances to the enclosure should be equipped with overlapping tarps or air locks
- the escape of abrasive and debris from the enclosure should be controlled, at air supply points, by the use of baffles, louvers, flap seals and filters
- general mechanical ventilation should be provided to remove contaminated air from the enclosure and filtered air should be provided to replace the exhausted air
- equipment venting such air should be equipped with filters adequate to control vented air to provincial environmental standards
- the air velocity within the enclosure should provide an average minimum cross-draft or down-draft past each worker during abrasive blasting operations as follows:
  - cross-draft velocity of 0.5 m/sec (100 ft/min)
  - down-draft velocity of 0.25 m/sec (50 ft/min)

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### Indoor Operations

- For Type 3a operations conducted indoors, barriers, partial enclosures, or full enclosures should be provided.
- For Type 3b operations (abrasive blasting, removal of lead-containing dust using an air mist extraction system) conducted indoors, full enclosures should be provided.

### Outdoor Operations

- For Type 3a and 3b operations conducted outdoors, barriers, partial enclosures, or full enclosures should be provided.
- For dry abrasive blasting conducted outdoors, full enclosures should be provided.

#### **6.4.3 Decontamination Facility**

A decontamination facility should be made available for workers carrying out for the following Type 3 operations:

##### Type 3a Operations

- removal of lead-containing coatings and materials using power tools without an effective dust collection system equipped with a HEPA filter
- demolition or clean-up of a facility where lead-containing products were manufactured

##### Type 3b Operations

- abrasive blasting of lead-containing coatings or materials
- removal of lead-containing dust using an air mist extraction system

The decontamination facility should be located as close as practicable to the work area and should consist of:

- a room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment
- a shower room as described below
- a room suitable for changing into street clothes and for storing clean clothing and equipment

The rooms in the decontamination facility should be arranged in sequence and constructed so as to prevent the spread of lead dust.

The shower room in the decontamination facility should be provided with the following:

- hot and cold water or water of a constant temperature that is not less than 40° Celsius or more than 50° Celsius

- 
- individual controls inside the room to regulate water flow and, if there is hot and cold water, temperature
  - clean towels.

Prior to each shift in which a decontamination facility is being used, a competent person should inspect the facility to ensure that there are no defects that would allow lead-containing dust to escape. Defects should be repaired before the facility is used. The decontamination facility should be maintained in a clean and sanitary condition.

Workers using the decontamination facility should do the following in the order shown:

- decontaminate protective clothing that will be reused on site by vacuuming with a HEPA-filter-vacuum or by damp wiping
- remove the decontaminated protective clothing
- place protective clothing that will not be reused on site in a container suitable for lead-containing dust and waste
- shower without removing the respirator
- remove and clean the respirator

#### **6.4.4 Dust Control Measures**

##### **General and Local Mechanical Ventilation**

Where the work area is enclosed, general mechanical ventilation should be provided. The air exhausted from an enclosed work area should pass through a dust collector effective for capturing the size of particulate matter being generated and for the volume and velocity of air moving through the enclosure.

Where a dust generating operation is carried out, local mechanical ventilation should be provided to remove dust at the source. Local mechanical ventilation is highly recommended for welding, burning, and high temperature cutting of lead-containing coatings and materials, and for the removal of lead-containing coatings and materials using power tools. Where local mechanical ventilation is used, the following should be met:

- Air velocity at any point in front of or at the opening of the ventilation hood should be sufficient to overcome opposing air currents and capture the contaminated air by causing it to flow into the hood.
- Air velocity at the source should be at least 0.5 m/sec (100 ft/min)
- Air discharged from the local mechanical ventilation system should pass through a HEPA filter and be routed out of the workplace in a way that will prevent the return of contaminants to the workplace.

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If local ventilation is not practicable, an appropriate respirator (as listed in Table 1) should be provided. However, the decision that local ventilation is not practicable should not be made without first consulting the joint health and safety committee or health and safety representative, if any, and without considering the following:

- any undue economic hardship to the employer that providing a local ventilation system would cause
- the frequency and duration of the operation
- any potential risks to the workers by not providing a local ventilation system.

### **Wet Methods**

Wet methods should be incorporated in the operation to reduce dust generation. Examples of wet methods include wetting surfaces, wet scraping, and wet shovelling.

Wetting should not be used if it would create a hazard or could cause damage to equipment or to the project. Power tools should be equipped with a shroud, and the shroud should be kept flush with the surface.

### **6.4.5 Personal Protective Equipment**

#### **Protective Clothing**

Every worker who enters a Type 3 operation work area should wear protective clothing (see Protective Clothing in Section 4.3).

#### Respirators

For most Type 3 operations, workers should wear a respirator with a NIOSH approved assigned protection factor of 50 (see Respirator Requirements in Table 1). Where the operation is abrasive blasting, the operator should wear a Type CE abrasive blast supplied air respirator operated in a pressure demand or positive pressure mode with a tight-fitting half-mask or tight-fitting full-facepiece.

It is recommended that compressed air used to supply supplied air respirators meet the breathing air purity requirements of CSA Standard Z180.1-00. Where an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor/alarm should be provided.

#### **6.4.6 Clean-Up**

Dust and waste should be cleaned up and removed by vacuuming with a HEPA filter equipped vacuum, wet sweeping and/or wet shovelling. Clean-up after each operation should be encouraged to prevent lead contamination and exposure to lead.

When abrasive blasting is finished, cleanup and removal of lead-containing dust and waste should take place.

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## **APPENDIX 1: Medical Surveillance Of Lead-Exposed Workers**

Where construction workers are exposed to airborne lead, measures and procedures to control their exposure should be implemented. This guide has outlined (in Section 4) the types of controls that should be in place for various work activities. But to ensure that these controls are effective they should be periodically evaluated. One way of doing this is by establishing a medical surveillance program. A medical surveillance program refers to the systematic collection, analysis, and evaluation of health data in the workplace to identify cases, patterns, or trends suggesting an adverse effect on workers' health. It is highly recommended that employers establish and maintain a medical surveillance program in their workplace.

The essential features of a lead medical surveillance program are outlined below.

### **Medical Surveillance Program**

#### **Purpose**

The objective of a medical surveillance program is to protect the health of workers by:

- ensuring their fitness for exposure to lead
- evaluating their absorption of lead
- enabling remedial action to be taken when necessary
- providing health education.

#### **Program**

The medical surveillance program should include the following:

- pre-employment and pre-placement medical examinations
- periodic medical examinations
- clinical tests
- health education
- record keeping.

#### **Medical Examinations**

The medical examination should include the following:

##### ***History***

The initial medical and occupational history should include enquiries about the worker's previous exposure to lead (both occupational and non-occupational), personal habits

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(smoking and hygiene), and history of present or past gastrointestinal, hemopoietic, renal, reproductive, endocrine, or nervous disorders.

At subsequent examinations, the history should be updated to include:

- information on the frequency and duration of exposure to lead since the previous examination;
- the occurrence of signs and symptoms that may be an early indication of lead intoxication, e.g., abdominal pain, constipation, vomiting, asthenia, paraesthesia and psychological change.

### ***Physical Examination***

Medical surveillance should include a general physical examination. Particular attention should be directed to those systems that may be affected by lead. Personal hygiene should also be noted.

### **Biological Monitoring**

Biological monitoring refers to the collection and assessment of bodily fluids or tissue, to evaluate occupational exposure to chemical hazards. The concentration of lead in a worker's blood is a good indicator of lead absorption by that individual. It does not indicate the total body burden of lead, but it is useful in the assessment of a worker's fitness for continued exposure to lead. As such, determining the blood lead levels in lead-exposed workers is highly recommended.

The concentration of lead in the blood can be used to determine:

- When a worker should be removed from lead exposure;
- When an enquiry regarding work practices and personal hygiene should be made;
- When further test(s) should be made; and,
- When a worker may be permitted to return to work.

The determination of whether a worker is fit, fit with limitations or unfit for exposure to lead should only be made by a physician. In addition, a physician should determine the required frequency for biological monitoring on an individual basis.

If symptoms or signs of lead intoxication are present the worker should be removed from lead exposure regardless of blood lead level.

In addition, it is recommended that a pre-placement blood-lead test be taken to establish a baseline for each worker that is exposed to lead.

## APPENDIX 2: Respirator Requirements & Other Measures and Procedures for Type 1, 2, and 3 Lead-Containing Operations

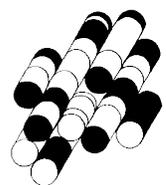
OPERATIONS	REQUIRED RESPIRATOR	OTHER MEASURES & PROCEDURES
<p><b>TYPE 1</b></p> <ul style="list-style-type: none"> <li>• Application of lead-containing coatings with a brush or roller.</li> <li>• Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap.</li> <li>• Removal of lead-containing coatings or materials using a power tool that has an effective dust collection system equipped with a HEPA filter.</li> <li>• Installation or removal of lead-containing sheet metal.</li> <li>• Installation or removal of lead-containing packing, babbitt or similar material</li> <li>• Removal of lead-containing coatings or materials using non-powered hand-held tools, other than manual scraping or sanding.</li> <li>• Soldering.</li> </ul>	<p>Respirators should not be necessary if general procedures listed in Section 6.1 of the Guideline are followed and if the levels of lead in air are less than 0.05 mg/m<sup>3</sup>. However, if the worker wishes to use a respirator, a half-mask particulate respirator with N-, R- or P-series filter, and 95, 99 or 100% efficiency should be provided.</p>	<ul style="list-style-type: none"> <li>• Washing facilities consisting of wash basin, water, soap and towels should be provided and workers should use these washing facilities before eating, drinking, smoking or leaving the project;</li> <li>• Workers should not eat, drink, chew gum or smoke in the work area;</li> <li>• Dust and waste should be cleaned up at regular intervals and placed in a container that is:               <ul style="list-style-type: none"> <li>- dust tight</li> <li>- identified as containing lead waste</li> <li>- cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before being removed from the work area</li> <li>- removed from the workplace frequently and at regular intervals;</li> </ul> </li> <li>• Drop sheets should be used below all lead operations which produce or may produce dust, chips, or debris containing lead;</li> <li>• Cleanup after each operation is encouraged to prevent lead contamination and exposure to lead;</li> <li>• Work area should be inspected at least daily to ensure that the work area is clean;</li> <li>• Compressed air or dry sweeping should not be used to clean up any lead-containing dust or waste from a work area or from clothing.</li> </ul>

OPERATIONS	REQUIRED RESPIRATOR	OTHER MEASURES & PROCEDURES
<b>TYPE 2</b>		
<b>TYPE 2a</b>	Half-mask particulate respirator with N-, R-, or P-series filter and 95, 99 or 100 percent efficiency.	<p>(In addition to Type 1 measures and procedures.)</p> <ul style="list-style-type: none"> <li>• Signs should be posted in sufficient numbers to warn of the lead hazard. There should be a sign, at least, at each entrance to the work area. The signs should display the following information in large, clearly visible letters: <ul style="list-style-type: none"> <li>- There is a lead dust, fume or mist hazard.</li> <li>- Access to the work area is restricted to authorized persons.</li> <li>- Respirators must be worn in the work area.</li> </ul> </li> <li>• Suitable protective clothing and equipment should be worn by every worker who enters the work area (refer to Section 4.3 of the guideline).</li> </ul>
<b>TYPE 2b</b>	<ul style="list-style-type: none"> <li>• Welding or high temperature cutting of lead-containing coatings or materials outdoors. This operation is considered a Type 2a operation only if it is short-term, not repeated, and if the material has been stripped prior to welding or high temperature cutting.</li> <li>• Removal of lead-containing coatings or materials by scraping or sanding using non-powered hand tools</li> <li>• Manual demolition of lead-painted plaster walls or building components by striking a wall with a sledge hammer or similar tool</li> </ul>	
	<ul style="list-style-type: none"> <li>• Spray application of lead-containing coatings.</li> </ul>	<ul style="list-style-type: none"> <li>Powered air purifying respirator equipped with a hood or helmet, and a high efficiency filter.</li> <li>OR</li> <li>Supplied air respirator equipped with a hood or helmet and operated in a continuous flow mode.</li> </ul>

OPERATIONS	REQUIRED RESPIRATOR	OTHER MEASURES & PROCEDURES
<p><b>TYPE 3</b></p> <p>Welding or high temperature cutting of lead-containing coatings or materials indoors or in a confined space.</p> <p>Burning of a surface containing lead.</p> <p>Dry removal of lead-containing mortar using an electric or pneumatic cutting device.</p> <p>Removal of lead-containing coatings or materials using power tools without an effective dust collection system equipped with a HEPA filter.</p> <p>Removal or repair of a ventilation system used for controlling lead exposure.</p> <p>Demolition or cleanup of a facility where lead-containing products were manufactured.</p> <p>An operation that may expose a worker to lead dust, fume or mist that is not a Type 1, Type 2, or Type 3b operation.</p>	<p>Full-facepiece air-purifying respirator equipped with N-, R-, or P-series filter and 100% efficiency.</p> <p>OR</p> <p>Tight-fitting PAPR with a high efficiency particulate filter.</p> <p>OR</p> <p>Half-mask or full-facepiece supplied air respirator operated in a continuous flow mode.</p> <p>OR</p> <p>Half-mask supplied air respirator operated in pressure-demand or other positive-pressure mode.</p>	<p><b>(In addition to Type 1 and Type 2 measures and procedures.)</b></p> <ul style="list-style-type: none"> <li>For Type 3a operations conducted indoors or outdoors, enclosures should be provided in the form of barriers, partial enclosures, or full enclosures.</li> <li>For Type 3b operations conducted indoors, full enclosures should be provided.</li> <li>With the exception of dry abrasive blasting conducted outdoors, enclosures provided for all other Type 3b operations conducted outdoors should be in the form of barriers, partial enclosures, or full enclosures. For dry abrasive blasting outdoors, full enclosures should be provided.</li> <li>Where there is an enclosure, general mechanical ventilation should be provided.</li> <li>A decontamination facility (refer to 6.4.3 of the guideline) should be made available for workers carrying out the following operations: <ul style="list-style-type: none"> <li>abrasive blasting of lead-containing coatings or materials</li> <li>the removal of lead-containing coatings or materials using power tools without an effective dust collection system equipped with a HEPA filter</li> <li>removal of lead-containing dust using an air mist extraction system</li> <li>demolition or cleanup of a facility where lead-containing products were manufactured.</li> </ul> </li> <li>When abrasive blasting is finished, dust and waste should be cleaned up and removed by vacuuming with a HEPA filter equipped vacuum, wet sweeping and/or wet shovelling.</li> <li>Where a dust generating operation is carried out, local exhaust ventilation should be provided to remove dust at the source. Wet methods should also be incorporated in the operation to reduce dust generation.</li> </ul>
<p><b>TYPE 3b</b></p> <p>Abrasive blasting of lead-containing coatings or materials.</p> <p>Removal of lead-containing dust using an air mist extraction system</p>	<p>Type CE abrasive-blast supplied air respirator operated in a positive-pressure mode with a tight-fitting half-mask facepiece.</p> <p>Type CE abrasive-blast supplied air respirator operated in a pressure-demand or positive pressure mode with a tight-fitting full-facepiece</p> <p>Supplied air respirator equipped with a tight-fitting half-mask or full-facepiece and operated in pressure demand or positive pressure mode.</p>	

# APPENDIX E

**TERRAPROBE INC.**



## DESIGNATED SUBSTANCES AND HAZARDOUS MATERIALS ASSESSMENT

**Building Demolition Project**  
276 Main Street  
Toronto, Ontario  
M4C 4X5

*Prepared for:*  
**Mr. Thomas Jakobec**

**Romlek Enterprises Inc.**  
39 Glen Oak Drive  
Toronto, Ontario  
M4E 1Y4

*Prepared by:*  
**Safetech Environmental Limited**



**Joshua Cinello, B.A.Sc. (OH&S)**  
OH&S Technician

*Reviewed by:*



**James R. Green, BA, CRSP, AMRT**  
Project Manager

**SEL Project Number 168617**

**Date of Site Work: August 8, 2017**

**Date of Issue: August 25, 2017**

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**EXECUTIVE SUMMARY**

Safetech Environmental Limited (SEL) was commissioned by Romlek Enterprises Inc. to conduct a designated substances and hazardous materials assessment within 276 Main Street, Toronto, Ontario.

The objective of our assessment was to determine the presence, location, condition and quantities of designated substances and other hazardous materials within that have the potential to be disturbed as part of planned building demolition activities so that appropriate control measures can be implemented to protect workers during the work.

A summary of our assessment results and general recommendations based on our findings are provided in the following Table. This Table should be considered a summary only. Please refer to the Results (Section 3) and Conclusions and Recommendations (Section 4) of our report for additional details.

Designated Substance	Findings	Recommendations
Asbestos	Asbestos-containing materials in the form of floor tiles and bell and spigot joint material on cast iron pipes was identified that would be disturbed as part of the project.	Remove following Type 1 operations following the requirements of O.Reg. 278/05.
	Other materials observed within the investigated area(s) that are suspected to be asbestos-containing includes high voltage wire jacketing, and hard textile breaker switch gear within electrical components. Given that the electrical components were energized, sampling could not be performed. However, based on the age of the materials they should be assumed to be asbestos-containing until proven otherwise.	
Lead	White and grey paint sampled within the building was found to be low-level lead-containing materials (<0.1% lead content).	No action required provided the low-level lead-containing paints are not disturbed aggressively (e.g. no power tools).

Lead (cont.)	Paints and surface coatings not sampled are assumed to be lead-containing.	Any disturbance of lead-containing paints and surface coatings should be conducted in accordance with measures and procedures outlined in the Environmental Abatement Council of Ontario (EACO) "Lead Guideline" (October 2014) and/or the Ministry of Labour "Lead on Construction Projects" guideline. Lead-containing wastes should be recycled if practicable or handled and disposed of according to O.Reg. 347.
	Lead may be a component of solder in pipe fittings and electrical equipment but is not expected to be a hazard as a result of the planned construction project.	No action required. Dispose of waste in accordance with O.Reg. 347.
	Suspect lead-containing batteries in the form of emergency lighting were identified that will require removal.	Batteries associated with emergency lighting is recommended to be sent to a recycling facility for proper treatment.
Mercury	Mercury vapour is expected to be present within fluorescent lamps.	Handle lamps with care and keep intact. All waste lamps are recommended to be sent to a lamp recycling facility.
Silica	Building materials identified that are suspected to contain crystalline silica and may be disturbed as part of the planned construction project include ceiling tiles, drywall walls/drywall joint compound and concrete.	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 2 operations are expected to be necessary based on the type of work to be conducted.
Other Designated Substances	No other designated substances are expected to be present in any significant quantities or in a form that would represent an exposure concern.	No protective measures or procedures specific to acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride are considered necessary.
<b>Other Hazardous Materials</b>	<b>Findings</b>	<b>Recommendations</b>
Urea Formaldehyde Foam Insulation	No UFFI was identified or is suspected within the areas assessed.	No action required.

Mould Contamination	Minor suspect mould growth was identified to be present on the drywall ceiling within the basement.	Workers should be informed of the presence of mould growth and disturbance should be avoided. Use of personal protective equipment may be required depending on proximity/type of work. Consider removing mould-contaminated sections to avoid potential mould exposure to workers and building occupants.
Pest Infestation	None identified in area(s) assessed.	No action required.
Polychlorinated Biphenyls	Building maintenance personnel indicated that all ballasts associated with fluorescent lights had been replaced with non-PCB ballasts.	No action required. However, each ballast should be inspected on a case by case basis by the demolition contractor to determine ballasts are suspected to contain PCBs. Suspect PCB-containing ballasts should be separated and disposed of at an authorized facility.
	One (1) transformer was observed within the basement electrical room and is assumed to contain PCBs.	At the time of decommissioning any suspect PCB-containing equipment should be verified by referring to the Environment Canada document entitled " <i>Handbook on PCB's in Electrical Equipment</i> ".  Any PCB-containing equipment taken out of service should be properly handled and disposed of at an authorized destruction facility.
Ozone Depleting and Global Warming Substances	One (1) air-conditioning unit was observed on the roof is assumed to contain ozone depleting and/or global warming substances.	Purge air-conditioning unit of remaining refrigerant prior to removal and disposal. 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 " <i>Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems</i> ".



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

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

**SAFETECH ENVIRONMENTAL LIMITED**

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

James R. Green, BA, CRSP, AMRT  
Project Manager



August 25, 2017

Romlek Enterprises Inc.  
39 Glen Oak Drive  
Toronto, Ontario  
M4E 1Y4

**Attention: Mr. Thomas Jakobec**

**RE: Designated Substances and Hazardous Materials Assessment  
276 Main Street, Toronto, Ontario**

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## **1.0 INTRODUCTION**

### **1.1 Background and Objectives**

Safetech Environmental Limited (SEL) was commissioned by Romlek Enterprises Inc. to conduct a designated substances and hazardous materials assessment within 276 Main Street, Toronto, Ontario. The objective of our assessment was to determine the presence, location, condition and quantities of designated substances and other hazardous materials that have the potential to be disturbed as part of planned building demolition activities so that appropriate control measures can be implemented to protect workers during the work.

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

This report documents findings of our on-site inspection that was conducted on August 8, 2017 and provides conclusions and recommendations based on our findings and knowledge of the planned building demolition project.

## 1.2 Scope of Work

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

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

This assessment only identified designated substances and hazardous materials that were deemed to be part of the building or somehow otherwise incorporated into the building structure and its finishes. Assessing occupant items such as stored products, furnishings, items and materials used or produced as part of a manufacturing process, etc. were beyond the scope of this assessment. In addition, our assessment did not include an investigation for underground materials or equipment (vessels, drums, underground storage tanks, pipes, cables, etc.). Furthermore, this assessment was limited to the areas investigated, and more specifically, to those materials that may be disturbed as part of the planned building demolition work, as described in Section 1.3.

## 1.3 Description of Area(s) Assessed

The area investigated included all accessible locations of 276 Main Street. The building assessed was constructed in an era known to include the use of asbestos-containing materials and other designated substances. The building itself is approximately 25,000 ft<sup>2</sup> in size and is constructed with a precast concrete slab floor, cinderblock walls, brick walls, drywall walls and ceilings, various vinyl floor tiles, and a corrugated metal ceiling. It has undergone various renovations and was observed to have a recently replaced boiler system.

## 2.0 METHODOLOGY

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

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

For background information regarding the above hazardous materials, please refer to Appendix E.

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

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

### 2.1 Designated Substances

#### 2.1.1 Asbestos

A visual inspection for the presence of both friable and non-friable asbestos-containing material (ACM) was performed within the assessment area(s). The condition of ACM

was rated as Good, Fair or Poor based on our assessment criteria provided in Appendix A.

Although destructive testing was not conducted, details regarding the possible presence of ACM in enclosed locations were provided on a case-by-case basis where our visual inspection indicated this possibility. Other materials observed within the investigated area(s) that are suspected to be asbestos-containing includes high voltage wire jacketing, and hard textile breaker switch gear within electrical components. Given that the electrical components were energized, sampling could not be performed. However, based on the age of the materials they should be assumed to be asbestos-containing until proven otherwise.

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

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

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

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

### **2.1.2 Lead**

An assessment for lead in paint was conducted by retrieving paint chip samples from representative surfaces within the area(s) assessed that were deemed to have a potential to be disturbed as part of the planned building demolition activities. The condition of painted surfaces from which samples were taken were also visually assessed for signs of deterioration such as cracking, chipping, flaking, bubbling and deterioration due to friction. The condition of these surfaces was assessed as good, fair or poor based on the degree and extent of deterioration.

The number of paint chip samples retrieved for analysis was based on the number of surface colours observed and the approximate surface area of the paint. Samples were not retrieved from paint finishes with limited application while additional samples were retrieved for paints covering greater surface areas to better account for possible variances in lead concentration due to underlying paints (if present). All paint chip samples were retrieved by scraping the paint down to the base material substrate to ensure collection of all layers of paint. Care was taken to avoid collection of the underlying substrate to reduce analytical substrate matrix interference.

Upon completion of our assessment, paint chip samples were submitted to an independent laboratory (EMSL) for the determination of lead content. This laboratory participates in and is accredited by the EPA (U.S. Environmental Protection Agency) for analysis of lead in paint chips through the American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP). Analysis was conducted by the laboratory following the EPA "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Method 7000B "Flame Atomic Absorption Spectrophotometry". Results of analysis were reported by the laboratory as the percentage of lead by weight of the total sample (% by wt.). The Laboratory Certificate of Analysis is included in Appendix C.

The presence of lead in other materials, such as lead sheeting, pigmented mortar, lead piping, lead solder, etc. were noted where observed but were not sampled to verify lead content. Lead can be present in these materials to varying degrees, depending on their age of application (refer to Appendix E for additional details) and should be considered lead-containing until proven otherwise.

### **2.1.3 Mercury**

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

#### **2.1.4 Silica**

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

#### **2.1.5 Other Designated Substances**

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

### **2.2 Other Hazardous Materials**

#### **2.2.1 Chemical Hazards**

##### **Urea Formaldehyde Foam Insulation (UFFI)**

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

#### **2.2.2 Biological Hazards**

##### **Mould Contamination**

A visual inspection to determine the possibility of mould growth was conducted within the area(s) assessed. Our assessment was limited to looking for evidence of mould growth and water damage (staining, material deterioration, efflorescence, etc.) on the surface of building materials, which may be an indicator of hidden mould growth. No moisture content readings of building materials were taken to determine their current condition. Additionally, destructive testing to confirm the presence/absence of hidden mould growth and material sampling to verify the presence/absence of mould on suspect surfaces was beyond the scope of this assessment.

## **Pest Infestation**

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

### **2.2.3 Environmental Hazards**

#### **Polychlorinated Biphenyls (PCBs)**

The presence of PCB-containing electrical equipment within the area(s) assessed was identified through visual inspection and knowledge of the timeline of historical use.

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

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

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

## **Ozone Depleting and Global Warming Substances**

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

### **3.0 RESULTS**

Results of our visual assessment and bulk sample analytical findings are summarized in the sections below. Photographs of conditions observed are referenced in the appropriate section where applicable (as **P#**) and are included in Appendix D.

#### **3.1 Designated Substances**

##### **3.1.1 Asbestos**

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 this report (Section 5.0) for additional details. The Laboratory Certificate of Analysis is included in Appendix B.

**Table 1**  
**Bulk Sample Analytical Results for Determination of Asbestos Content**  
**276 Main Street, Toronto, Ontario**  
**Sample Collection Date: August 8, 2017**

Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
1a	Drywall Joint Compound	Basement	None Detected	Non-ACM
1b		Studio A		
1c		Basement		
1d		Studio B		
1e		1 <sup>st</sup> Floor Mezzanine Storage		
1f		2 <sup>nd</sup> Floor		
1g		2 <sup>nd</sup> Floor Storage		
2a	12x12 Light Brown Vinyl Floor Tile	Studio A	2% Chrysotile	ACM
2b			Not Analyzed	
2c				
3a	12x12 Brown Vinyl Floor Tiles	2 <sup>nd</sup> Floor Washroom	None Detected	Non-ACM
3b				
3c				
4a	12x12 White Vinyl Floor Tiles	Unit 276B Washroom	None Detected	Non-ACM
4b				
4c				
5a	12x12 Yellow Vinyl Floor Tiles	Unit 276B Kitchen	None Detected	Non-ACM
5b				
5c				
6a	12x12 White Vinyl Floor Tiles	2 <sup>nd</sup> Floor Offices	None Detected	Non-ACM
6b				
6c				
7a	12x12 White Vinyl Floor Tiles w/Brown Streaks	Studio A Men's Washroom	None Detected	Non-ACM
7b				
7c				
8a	12x12 Dark Brown Vinyl Floor Tiles	Studio B Kitchen	None Detected	Non-ACM
8b				
8c				
9a	12x12 Light Brown Vinyl Floor Tiles	Studio B Kitchen	None Detected	Non-ACM
9b				
9c				
10a	12x12 Red Vinyl Floor Tiles	Studio B Kitchen	None Detected	Non-ACM
10b				
10c				
11a	12x12 White Vinyl Floor Tiles	Studio B Kitchen	None Detected	Non-ACM
11b				
11c				

Sample No.	Material Description	Sample Location	Asbestos Content	Material Classification
12a	12x12 Beige Vinyl Floor Tiles	Maintenance Closet	None Detected	Non-ACM
12b				
12c				
13a	12x12 Grey Vinyl Floor Tiles w/Black Streaks	Basement	None Detected	Non-ACM
13b				
13c				
14a	12x12 Grey Vinyl Floor Tiles	South Stairwell	None Detected	Non-ACM
14b				
14c				
15a	Stucco Ceiling	Basement Electrical Room	None Detected	Non-ACM
15b		Basement Boiler Room		
15c				
16a	2x4 Lay in Ceiling Tile (Fissure/Pinhole)	2 <sup>nd</sup> Floor Music School	None Detected	Non-ACM
16b				
16c				
17a	Paper Insulation	Studio A - Columns	None Detected	Non-ACM
17b				
17c				
18a	Roofing Membrane	Exterior - Rooftop	None Detected	Non-ACM
18b				
18c				
19a	Roofing Underlay	Exterior - Rooftop	None Detected	Non-ACM
19b				
19c				
20a	White Window Frame Caulking	Exterior	None Detected	Non-ACM
20b				
20c				
21a	Brown Caulking on Flashing	Exterior	None Detected	Non-ACM
21b				
21c				

As per O.Reg. 278/05, ACM contains  $\geq 0.5\%$  asbestos by dry weight.

Materials assessed for asbestos content are summarized in Table 2 based on the type/use of the material. The condition and friability of materials confirmed or suspected to be asbestos-containing (based on our visual assessment, results of bulk sample analysis or from a review of previous analytical results) is provided. Condition (Cond.) ratings are provided as Good (G), Fair (F) or Poor (P) based on our Assessment Criteria provided in Appendix A. Estimates of quantity have only been provided for confirmed or suspected asbestos-containing materials that were deemed to have a potential to be disturbed. Any quantities provided should be considered rough estimates only and should not be relied upon for bidding purposes. It is the responsibility of the selected Contractor to obtain actual quantities.

**Table 2**  
**Results of Assessment for Asbestos-Containing Materials**  
**276 Main Street, Toronto, Ontario**

<b>Sprayed and Loose Fill Insulating Materials</b>	<b>Location/Description</b>	<b>Cond.</b>	<b>Est. Quantity</b>	<b>Friability</b>
Sprayed Fireproofing	None identified in area(s) assessed.	N/A	N/A	N/A
Sprayed Insulation	None identified in area(s) assessed.	N/A	N/A	N/A
Loose Fill / Vermiculite Insulation	None identified in area(s) assessed.	N/A	N/A	N/A
<b>Thermal System Insulation</b>	<b>Location/Description</b>	<b>Cond.</b>	<b>Est. Quantity</b>	<b>Friability</b>
Mechanical Pipe Insulation – Straights	Linear sections of mechanical piping within the building were observed to be uninsulated or insulated with fibreglass.	N/A	N/A	N/A
Mechanical Pipe Insulation – Fittings (elbows, valves, tees, hangars, etc.)	Mechanical pipe fittings within the building were observed to be uninsulated or insulated with fibreglass.	N/A	N/A	N/A
HVAC Duct Insulation	HVAC ductwork was observed to be uninsulated or insulated with fibreglass.	N/A	N/A	N/A
Breeching / Exhaust Insulation	None identified in area(s) assessed.	N/A	N/A	N/A
Tank Insulation	Hot Water tanks were observed to be uninsulated.	N/A	N/A	N/A
Boiler Insulation	The boiler was observed to have been recently replaced/upgraded and was uninsulated.	N/A	N/A	N/A
Other Mechanical Equipment Insulation	Insulating paper was observed on structural wood columns within Studio A. This material was sampled and confirmed to be non-asbestos containing. Refer to sample set 17 in Table 1.	N/A	N/A	N/A
<b>Architectural Finishes &amp; Finishing Materials</b>	<b>Location/Description</b>	<b>Cond.</b>	<b>Est. Quantity</b>	<b>Friability</b>
Sprayed Texture / Stucco Finishes	Stucco ceiling was observed in the basement Electrical Room and Boiler Room. This material was sampled and confirmed to be non-asbestos containing. Refer to sample set 15 in Table 1.	N/A	N/A	N/A
Plaster Finishes	None identified in area(s) assessed.	N/A	N/A	N/A

Drywall Joint Compound	Drywall joint compound was observed to be present throughout the building. This material was sampled and confirmed to be non-asbestos containing. Refer to sample set 1 in Table 1.	N/A	N/A	N/A
<b>Ceiling Tiles</b>	<b>Location/Description</b>	<b>Cond.</b>	<b>Est. Quantity</b>	<b>Friability</b>
Lay-in Acoustic Ceiling Tiles	2x4 Lay in ceiling tiles (fissure/pinhole) ceiling tiles were observed within the 2 <sup>nd</sup> Floor music classroom. This material was sampled and confirmed to be non-asbestos containing. Refer to sample set 16 in Table 1.	N/A	N/A	N/A
	1x1 Ceiling tiles observed within the 2 <sup>nd</sup> Floor music classroom were identified to be constructed with a wood fibre material and are not suspected to contain asbestos.	N/A	N/A	N/A
Transite Ceiling Panels	None identified in area(s) assessed.	N/A	N/A	N/A
<b>Flooring</b>	<b>Location/Description</b>	<b>Cond.</b>	<b>Est. Quantity</b>	<b>Friability</b>
Vinyl Floor Tiles	<b>12x12 Light brown vinyl floor tiles</b> were observed within Studio A. This material was sampled and confirmed to contain <b>2% Chrysotile</b> asbestos.	Good	~1,000 ft <sup>2</sup>	Non-Friable
	Various other vinyl floor tiles were observed throughout the building. These were all sampled and confirmed to be non-asbestos containing. Refer to sample sets 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14 in Table 1.	N/A	N/A	N/A
Vinyl Sheet Flooring	None identified in area(s) assessed.	N/A	N/A	N/A
<b>Asbestos Cement Products</b>	<b>Location/Description</b>	<b>Cond.</b>	<b>Est. Quantity</b>	<b>Friability</b>
Piping	None identified in area(s) assessed.	N/A	N/A	N/A
Roofing, Siding, Wallboard	None identified in area(s) assessed.	N/A	N/A	N/A
Other Cement Products	None identified in area(s) assessed.	N/A	N/A	N/A
<b>Misc. Materials</b>	<b>Location/Description</b>	<b>Cond.</b>	<b>Est. Quantity</b>	<b>Friability</b>
Roofing	Roofing materials including membrane and underlay were observed on the rooftop. These materials were sampled and confirmed to be non-asbestos. Refer to sample sets 18 and 19 in Table 1.	N/A	N/A	N/A
Caulking	White window caulking and brown caulking on flashing were observed on the exterior. These materials were sampled and confirmed to be non-asbestos containing. Refer to sample sets 20 and 21 in Table 1.	N/A	N/A	N/A

Other Materials	Other materials observed within the investigated area(s) that are suspected to be asbestos-containing includes high voltage wire jacketing, and hard textile breaker switch gear within electrical components. Given that the electrical components were energized, sampling could not be performed. However, based on the age of the materials they should be assumed to be asbestos-containing until proven otherwise.	N/D	N/D	N/D
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Notes: N/A=Not Applicable; N/D=Not Determined

### 3.1.2 Lead

Laboratory analytical results for paints tested to determine lead content are summarized below in Table 3. The Laboratory Certificate of Analysis is included in Appendix C. Refer to Section 4.1.2 of this report for recommended lead abatement procedures (if any) that correspond to the type of proposed construction, renovation, or demolition work.

**Table 3  
Results of Paint Condition and Lead Content Assessment  
276 Main Street, Toronto, Ontario  
Sample Collection Date: August 8, 2017**

Sample No.	Location	Surface	Paint Colour	Condition	Lead Conc. (% by wt.)	Material Classification
L-01	Throughout	Drywall	White	Good	<0.0090	LLL
L-02	Exterior	Concrete	Grey	Good	<0.0090	LLL

LCM: Lead-Containing Material ( $\geq 0.1\%$  Lead Content); LLL: Low Level Lead Paint ( $< 0.1\%$  Lead Content)

Additional suspect lead-containing materials visually identified within the investigated areas that may require disturbance included the following:

- Paint finishes not sampled;
- A component of solder in pipe fittings and electrical equipment; and
- Possible lead-containing batteries in the form of emergency lighting.

### 3.1.3 Mercury

Mercury is present within the area(s) assessed in the form of:

- Vapour within fluorescent lamps; and
- Sealed liquid within various gauges and thermometers associated with the boiler and other mechanical equipment.

### **3.1.4 Silica**

A number of building materials were identified within the surveyed area(s) that are suspected to contain crystalline silica. This includes the following materials:

- Concrete;
- Concrete block and associated mortar;
- Drywall and associated drywall joint compound; and
- Acoustical ceiling tiles.

### **3.1.5 Other Designated Substances**

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

## **3.2 Other Hazardous Materials**

### **3.2.1 Chemical Hazards**

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

### **3.2.2 Biological Hazards**

#### **Mould Contamination**

Minor suspect mould growth (less than 10 sq. ft.) and water staining was identified to be present on drywall ceiling within the basement.

#### **Pest Infestation**

There was no visible evidence of any significant pest infestation within the surveyed area(s).

### **3.2.3 Environmental Hazards**

#### **Polychlorinated Biphenyls (PCBs)**

Building maintenance personnel indicated that a lighting retrofit has occurred in the building whereby all PCB-containing ballasts were replaced.

One (1) transformer was identified within the basement Electrical Room that is assumed to be PCB-containing. No significant staining or discolouration of the concrete floor was noted beneath the transformer that may be suggestive of previous leakage. The transformer itself was also observed to be in good condition and did not exhibit any signs of leakage.

### **Ozone Depleting and Global Warming Substances**

One (1) air-conditioning unit was observed on the roof is assumed to contain ozone depleting and/or global warming substances.

No other equipment was observed that is suspected to contain ozone depleting and/or global warming substances (with the exception of the refrigerator and freezer).

## **4.0 CONCLUSIONS AND RECOMMENDATIONS**

### **4.1 Designated Substances**

#### **4.1.1 Asbestos**

As results summarized in Table 1 indicate, asbestos was not detected in any of the bulk samples of drywall joint compound, stucco, various vinyl floor tiles, insulation on columns, caulking, or roofing materials retrieved for analysis. Therefore, these materials are considered to be Non-ACM and there are no requirements for management, disturbance or removal of this material under O.Reg. 278/05.

Results of our assessment indicated that the following asbestos-containing materials are present within the building that that are likely to be disturbed as part of planned construction project:

- 12x12 Light brown vinyl floor tiles (Studio A); and
- Bell and spigot joint material associated with case iron pipes.

In accordance with O.Reg. 278/05, prior to the demolition of the building, any identified asbestos-containing materials must be removed from the building. However, this does not apply so as to prevent work necessary to gain access to the asbestos-containing material that is to be removed, if the workers doing the work are protected from the hazard. Our recommendations for the removal of the aforementioned asbestos-containing materials can be found below.

#### ***Vinyl Floor Tiles***

The 12x12 light brown vinyl floor tiles located in Studio A is considered to be a non-friable ACM. As per O.Reg. 278/05, removal of non-friable ACM can be conducted following Type 1 operations; as long as the material can be removed without being

broken, cut, drilled or otherwise similarly disturbed. If the material cannot be removed without it breaking or being similarly disturbed then the work should be conducted using non-powered hand tools and the material should be wetted to control the spread of dust. If the material cannot be wetted or if power tools attached to dust-collecting devices equipped with HEPA (high efficiency particulate aerosol) filters are used during removal or disturbance, then work should be performed following Type 2 operations. If non-friable materials are removed or disturbed using power tools that are not attached to dust-collecting devices that are equipped with HEPA filters then work should be conducted following Type 3 operations.

### ***Assumed Asbestos-Containing Materials***

Other materials observed within the investigated area(s) that are suspected to be asbestos-containing includes high voltage wire jacketing, and hard textile breaker switch gear within electrical components. Given that the electrical components were energized, sampling could not be performed. However, based on the age of the materials they should be assumed to be asbestos-containing until proven otherwise. These materials are considered to be non-friable ACM and can be removed following Type 1 procedures provided the materials are wetted and removed with hand tools.

### ***General Recommendations***

The removal or disturbance of ACM must follow the measures and procedures indicated in O.Reg. 278/05. This work should be conducted by workers who have received proper training by a "competent person" in the hazards of asbestos exposure, personal hygiene and work practices, and the use and care of respirators and protective clothing. Any worker/supervisor who works in a Type 3 operation must successfully complete the Asbestos Abatement Worker or Supervisor Training Program approved by the Ministry of Training, Colleges and Universities.

It is recommended that all work involving the removal or disturbance of ACM be subject to inspection and testing to document conformance with O.Reg. 278/05 requirements. The degree of inspection and testing is dependent on site-specific conditions such as the type, duration, size and location of the work. In most circumstances Type 3 operations require a visual inspection and clearance air testing to be conducted by a competent worker on completion of the work. The inspection should be conducted to ensure that the enclosure and the work area inside the enclosure are free from visible dust, debris or residue that may contain asbestos. Clearance air testing for Type 3 operations requires a minimum number of air samples to be taken (depending on the size of the work area) following specific sampling and analytical procedures and all samples taken must meet the clearance criteria set out in O.Reg. 278/05.

#### ***4.1.2 Lead***

Results of paint chip analysis for the determination of lead content indicated that white paint associated with drywall, and exterior grey paint is considered a 'low-level lead paint' (<0.1% based on requirements of the Environmental Abatement Council of

Ontario (EACO) Lead Guideline (2014)). If the 'low-level lead paints' are disturbed in a non-aggressive manner (not using power tools/abrasive blasting, grinding, welding, heating, etc.), then respirators are not considered necessary. However, Type 1 measures and procedures should still be implemented during the non-aggressive disturbance of 'low-level lead paints', including, but not limited to, no smoking, eating, drinking and chewing gum in the work area, dust suppression methods must be implemented, and facilities must be made available to that workers can wash their hands and face.

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

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

Operation	Description
Class 1	<ol style="list-style-type: none"> <li>1. Removal of lead-containing or lead-based paints and surface coatings with a chemical gel/stripper or paste;</li> <li>2. Application of lead-containing or lead-based paints and surface coatings with a brush, roller or sponge.</li> <li>3. Installation or removal of lead sheeting or flashing.</li> <li>4. Installation or removal of lead-containing packing, babbitt, caulking, gasket or similar material.</li> <li>5. Removal of materials coated with lead-containing or lead-based paints and surface coatings, using non-powered hand tools, where the material remains chiefly intact and is not crumbled, pulverized or powdered.</li> <li>6. Operating construction or demolition equipment (e.g. excavator, bulldozer) during building renovation or demolition where lead-based paints or surface coatings are present on building materials and are being disturbed.</li> <li>7. Soldering with lead solder.</li> <li>8. Removing lead-containing or lead-based paints or surface coatings with a heat gun.</li> <li>9. Removing lead-containing and lead-based paints and surface coatings using a high-pressure water jet (e.g. pressure washer).</li> </ol>

Operation	Description
Class 2a	<ol style="list-style-type: none"> <li>1. Removal of lead-containing or lead-based paints and surface coatings or lead-containing materials using a power tool that has an effective dust collection system equipped with a HEPA filter.</li> <li>2. Welding, torching or high temperature cutting of lead-containing materials indoors when using an effective fume collector or smoke eater that filters and exhausts lead fume and expels it directly outdoors (away from occupants, entrances, walkways, rest areas, etc.). Fume collector or smoke eater must have effective source control and capture velocity, minimum of 0.5 metres per second (100 feet per minute) at the work surface.</li> <li>3. Welding, torching or high temperature cutting of lead-containing and lead-based paints and surface coatings or lead-containing materials outdoors.</li> <li>4. Removal of lead-containing mortar using handheld non-powered tools.</li> <li>5. Removal of lead-containing and lead-based paints and surface coatings or lead-containing materials by scraping or sanding (including wet sanding) using non-powered hand tools.</li> <li>6. Demolition of plaster or building components that crumble, pulverize or powder and are covered with lead-containing or lead-based paints or surface coatings.</li> <li>7. Clean up and removal of a significant amount of lead-containing dust and debris (that can be made easily airborne) using wet methods or HEPA vacuums.</li> </ol>
Class 2b	<ol style="list-style-type: none"> <li>1. Spray application of lead-containing paints and surface coatings</li> </ol>
Class 3a	<ol style="list-style-type: none"> <li>1. Removal of lead-containing or lead-based paints and surface coatings or lead-containing materials using a power tool without an effective dust collection system equipped with a HEPA filter.</li> <li>2. Welding, torching or high temperature cutting of lead-containing materials indoors or in a confined space (e.g. within a ditch or pit).</li> <li>3. Removal of lead-containing mortar using a powered cutting device.</li> <li>4. Burning of a material containing lead.</li> <li>5. Removal, cleaning or repair of a ventilation system or ductwork used for controlling lead exposure.</li> <li>6. Spray application of lead-based paints and surface coatings.</li> <li>7. In the absence of an exposure assessment:               <ol style="list-style-type: none"> <li>a. demolition or cleanup of a facility where lead-containing products were manufactured and significant dust and debris, which can be made easily airborne, is present.</li> <li>b. cleanup of dust and debris down range of a firing station in an indoor firing range. an operation that may expose a worker to lead dust, fume or mist that is not a Class 1, Class 2, or Class 3B operation.</li> </ol> </li> </ol>
Class 3b	<ol style="list-style-type: none"> <li>1. Abrasive blasting of lead-containing and lead-based paints and surface coatings or lead-containing materials (including wet, slurry and dry abrasive blasting and dry-ice blasting).</li> </ol>

Emergency lighting is suspected that these emergency lights contain lead-acid batteries. When emergency lighting is to removed/replaced as part of the scheduled work activities, the batteries are recommended to be sent to a recycling facility for proper treatment.

Additional suspect lead-containing products include paints on various surfaces and solder on pipe fittings and electrical components. Future testing of these materials and specific handling/disposal requirements may be necessary if/when these materials are to be disturbed.

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

#### **4.1.3 Mercury**

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

Liquid mercury is suspected to be present in thermometers, barometers and other measuring devices (pressure gauges/sensors, vacuum gauges, manometers, etc.), thermostats and a variety of other electrical switches (temperature sensitive, tilt switches, float switches, etc.) associated with mechanical equipment. Care should be taken not to disturb these items during the work as breakage could cause a spill of liquid mercury. If any of these items are to be removed it should be done so carefully to avoid spillage and stored/packaged in a manner that will prevent breakage or spillage. Any mercury-containing equipment that is to be removed is recommended to be recycled rather than disposed of in landfill.

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

#### **4.1.4 Silica**

Suspect silica-containing materials were identified to be present within the project-specific work area. In their current state, building materials containing silica do not represent a risk to building occupants or construction workers. Risks associated with exposure to silica arise during demolition activities that cause silica dust to be created

(particularly grinding, drilling or cutting operations and during major demolition), resulting in a crystalline silica inhalation hazard.

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

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

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

#### **4.1.5 Other Designated Substances**

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

### **4.2 Other Hazardous Materials**

#### **4.2.1 Chemical Hazards**

As no UFFI was identified or is suspected to be present within the surveyed area(s) no further action is required. However, given that no destructive testing was conducted, there is a remote possibility that UFFI could be hidden within locations such as exterior wall cavities. If suspect foam insulation is identified during renovation/demolition activities work should be stopped and the area should be re-assessed to evaluate conditions and determine appropriate control measures and worker protection, if necessary.

#### **4.2.2 Biological Hazards**

##### **Mould Contamination**

Mould contamination identified on drywall ceiling within the basement is considered to be minor (i.e. less than 10 sq. ft. of visible mould growth). Removal of this material is recommended to be conducted following Level 1 mould remediation procedures outlined in the Environmental Abatement Council of Ontario's (EACO) "Mould Abatement Guidelines" (Edition 2, 2010).

##### **Pest Infestation**

No visual evidence of any significant pest infestation was observed within the area(s) assessed. Therefore, no additional precautionary measures are deemed necessary for protection against biological contaminants potentially associated with pest infestation.

#### **4.2.3 Environmental Hazards**

##### **Polychlorinated Biphenyls (PCBs)**

Building operations staff indicated that ballasts associated with fluorescent lights have been replaced in the building. Based on this information, no further action is required. However, the constructor must have a competent worker inspect each ballast during demolition activities to determine if the ballast is suspected to contain PCBs.

The federal government has set strict regulations for the handling, storage and disposal of PCBs. The *PCB Regulations* (SOR/2008-273) came into effect on September 5<sup>th</sup>, 2008 and consolidates and replaces the *Chlorobiphenyls Regulations* (SOR/91-152) and the *Storage of PCB Material Regulations* (SOR/92-507). The purpose of the PCB Regulations is to improve the protection of Canada's environment and the health of Canadians by minimizing the risks posed by the use, storage and release of PCBs by accelerating the elimination of these substances.

As of December 31, 2009 all current PCB storage sites are to have been eliminated and there should no longer be any electrical capacitors, electrical transformers, electromagnets, heat transfer equipment or any other equipment in service that contains PCBs at a concentration greater than 500 mg/kg (500 ppm). As of this time, all of this equipment should have been removed from service and sent for destruction. Furthermore, the PCB Regulations restricts the use of equipment containing PCBs (other than light ballasts or pole-top electrical transformers) at concentrations exceeding 50 mg/kg (50 ppm) in sensitive areas (such as drinking water treatment plants, schools, hospitals and senior citizen care facilities) by the same date. All other locations have until December 31, 2025 to decommission equipment containing 50 ppm to 500 ppm PCBs.

Additional suspect PCB-containing electrical equipment in the form of one (1) transformer was identified within the basement Electrical Room. Based on information obtained from the nameplate this transformer has approximately 5.4 pounds of dielectric fluid containing Aroclor 1232, which is a trade name for a specific type of PCB. One (1) wall-mounted capacitor identified in the same location was classified as "assumed PCB-containing" as the date of manufacture or other pertinent information could not be identified at the time of our assessment. This electrical equipment is not expected to be decommissioned and as long as operational can remain in place until the regulated decommissioning deadline of December 31, 2025. At the time of decommissioning any suspect PCB-containing equipment should be verified by referring to the Environment Canada document entitled "*Handbook on PCB's in Electrical Equipment*" (Third Edition, April 1988) to aid in identification. In some cases, sampling and analysis of the material or liquid may be necessary for full verification.

When PCB-containing equipment is taken out of service, jurisdiction falls under provincial regulations. As per Ontario Regulation 347, General - *Waste Management*, the land disposal of PCB waste is prohibited. PCB wastes in Ontario are regulated under Ontario Regulation 362, *Waste Management – PCBs* (O.Reg. 362), made under the Environmental Protection Act. Under this regulation, PCB waste is defined as any waste material containing PCBs at a concentration of more than fifty (50) parts per million by weight (i.e. >50mg/kg), with the exception of an electrical capacitor that has never contained over 1 kg of PCB's. Any PCB-containing equipment taken out of service should be properly handled and disposed of at an authorized destruction facility in accordance with the requirements of Federal Regulation SOR/2008-273 and Ontario Regulation 362.

## Ozone Depleting and Global Warming Substances

Ontario Regulation 463/10, "Ozone Depleting Substances and Other Halocarbons" (O.Reg. 463/10, made under the Environmental Protection Act) controls the use, discharge, sale, transfer, transport, storage and disposal of ozone depleting substances and halocarbons in Ontario. This regulation enhances the control and management of ODS and other halocarbons to prevent or minimize emissions, which serves a dual environmental benefit of lowering emissions of substances that deplete the ozone layer and contribute to global warming.

One (1) air-conditioning unit was noted on the roof of the building. This air-conditioning unit should this unit require removal it is to be conducted following the requirements of O.Reg. 463/10 HCFCs are considered "class 2" ozone depleting substances.

O.Reg. 463/10 restricts the discharge of a class 1 and class 2 ozone depleting substance or a halocarbon into the natural environment or within a building. 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*". This work must be conducted by a certified person who holds a valid Ozone Depletion Prevention (ODP) Certificate. Refrigeration equipment and containers that are to be dismantled and disposed of need to be properly purged of remaining refrigerant by a certified person and a notice must be affixed to the equipment or container that indicates it no longer contains a refrigerant (in addition to other information required by the regulation).

Any refrigerant that is removed from an air-conditioning unit, heat pump, refrigeration or freezer unit (that is not mobile) is defined as a Stationary Refrigerant Waste under Ontario Regulation 347 and must be collected, handled, transported and recycled or disposed of in accordance with the requirements set forth in Sections 30 to 35 of this regulation.

### **5.0 LIMITATIONS**

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

In preparation of this report, Safetech Environmental Limited (SEL) relied on information supplied by others, including without limitation, information pertaining to the history and operation of the site, test results and reports of other consultants and testing services provided by independent laboratories. Except as expressly set out in this report, SEL

has not made any independent verification of information provided by independent entities.

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

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

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

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

# **Appendix A**

## **Condition Assessment Criteria for Asbestos-Containing Materials**

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

### Condition Assessment Criteria for Asbestos-Containing Materials

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

# **Appendix B**

**Laboratory Certificate of Analysis - Asbestos**

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# EMSL Canada Inc.

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

EMSL Canada Order 551708922  
 Customer ID: 55SELI62  
 Customer PO: 168617  
 Project ID:

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

**Phone:** (905) 624-2722  
**Fax:** (905) 624-4306  
**Collected:**  
**Received:** 8/10/2017  
**Analyzed:** 8/14/2017

**Proj:** 276 Main St - 168617

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

**Client Sample ID:** 1a **Lab Sample ID:** 551708922-0001  
**Sample Description:** Drywall Joint Compound - Basement

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 1b **Lab Sample ID:** 551708922-0002  
**Sample Description:** Drywall Joint Compound - Studio A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 1c **Lab Sample ID:** 551708922-0003  
**Sample Description:** Drywall Joint Compound - Basement

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 1d **Lab Sample ID:** 551708922-0004  
**Sample Description:** Drywall Joint Compound - 1st Floor Studio B

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	3%	97%	None Detected	

**Client Sample ID:** 1e **Lab Sample ID:** 551708922-0005  
**Sample Description:** Drywall Joint Compound - 1st Floor Mezzanine Storage

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 1f **Lab Sample ID:** 551708922-0006  
**Sample Description:** Drywall Joint Compound - 2nd Floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 1g **Lab Sample ID:** 551708922-0007  
**Sample Description:** Drywall Joint Compound - 2nd Floor Storage

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	



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

EMSL Canada Order 551708922  
 Customer ID: 55SELI62  
 Customer PO: 168617  
 Project ID:

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

**Client Sample ID:** 2a **Lab Sample ID:** 551708922-0008  
**Sample Description:** Light Brown Vinyl Floor Tile - Studio A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Tan	0%	98%	2% Chrysotile	

**Client Sample ID:** 2b **Lab Sample ID:** 551708922-0009  
**Sample Description:** Light Brown Vinyl Floor Tile - Studio A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017		Positive Stop (Not Analyzed)			

**Client Sample ID:** 2c **Lab Sample ID:** 551708922-0010  
**Sample Description:** Light Brown Vinyl Floor Tile - Studio A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017		Positive Stop (Not Analyzed)			

**Client Sample ID:** 3a **Lab Sample ID:** 551708922-0011  
**Sample Description:** Brown Vinyl Floor Tiles - 2nd Floor Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Orange	0%	100%	None Detected	

**Client Sample ID:** 3b **Lab Sample ID:** 551708922-0012  
**Sample Description:** Brown Vinyl Floor Tiles - 2nd Floor Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Orange	0%	100%	None Detected	

**Client Sample ID:** 3c **Lab Sample ID:** 551708922-0013  
**Sample Description:** Brown Vinyl Floor Tiles - 2nd Floor Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Tan	0%	100%	None Detected	

**Client Sample ID:** 4a **Lab Sample ID:** 551708922-0014  
**Sample Description:** White Vinyl Floor Tiles - Unit 276 B Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Beige	0%	100%	None Detected	

**Client Sample ID:** 4b **Lab Sample ID:** 551708922-0015  
**Sample Description:** White Vinyl Floor Tiles - Unit 276 B Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Beige	0%	100%	None Detected	



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EMSL Canada Order 551708922  
Customer ID: 55SELI62  
Customer PO: 168617  
Project ID:

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

**Client Sample ID:** 4c **Lab Sample ID:** 551708922-0016  
**Sample Description:** White Vinyl Floor Tiles - Unit 276 B Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 5a **Lab Sample ID:** 551708922-0017  
**Sample Description:** Yellow Vinyl Floor Tiles - Unit 276 B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Orange	0%	100%	None Detected	

**Client Sample ID:** 5b **Lab Sample ID:** 551708922-0018  
**Sample Description:** Yellow Vinyl Floor Tiles - Unit 276 B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Orange	0%	100%	None Detected	

**Client Sample ID:** 5c **Lab Sample ID:** 551708922-0019  
**Sample Description:** Yellow Vinyl Floor Tiles - Unit 276 B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Yellow	0%	100%	None Detected	

**Client Sample ID:** 6a **Lab Sample ID:** 551708922-0020  
**Sample Description:** White Vinyl Floor Tiles - 2nd Floor Offices

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	0%	100%	None Detected	

**Client Sample ID:** 6b **Lab Sample ID:** 551708922-0021  
**Sample Description:** White Vinyl Floor Tiles - 2nd Floor Offices

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	0%	100%	None Detected	

**Client Sample ID:** 6c **Lab Sample ID:** 551708922-0022  
**Sample Description:** White Vinyl Floor Tiles - 2nd Floor Offices

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 7a **Lab Sample ID:** 551708922-0023  
**Sample Description:** White Vinyl Floor Tiles w/Brown Streaks - Studio A Men's Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	



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Customer ID: 55SELI62  
Customer PO: 168617  
Project ID:

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

**Client Sample ID:** 7b **Lab Sample ID:** 551708922-0024  
**Sample Description:** White Vinyl Floor Tiles w/Brown Streaks - Studio A Men's Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 7c **Lab Sample ID:** 551708922-0025  
**Sample Description:** White Vinyl Floor Tiles w/Brown Streaks - Studio A Men's Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 8a **Lab Sample ID:** 551708922-0026  
**Sample Description:** Dark Brown Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Brown	0%	100%	None Detected	

**Client Sample ID:** 8b **Lab Sample ID:** 551708922-0027  
**Sample Description:** Dark Brown Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Brown	0%	100%	None Detected	

**Client Sample ID:** 8c **Lab Sample ID:** 551708922-0028  
**Sample Description:** Dark Brown Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Brown	0%	100%	None Detected	

**Client Sample ID:** 9a **Lab Sample ID:** 551708922-0029  
**Sample Description:** Light Brown Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Brown	0%	100%	None Detected	

**Client Sample ID:** 9b **Lab Sample ID:** 551708922-0030  
**Sample Description:** Light Brown Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Brown	0%	100%	None Detected	

**Client Sample ID:** 9c **Lab Sample ID:** 551708922-0031  
**Sample Description:** Light Brown Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Brown	0%	100%	None Detected	



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Project ID:

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

**Client Sample ID:** 10a **Lab Sample ID:** 551708922-0032  
**Sample Description:** Red Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	8/14/2017	Orange	0%	100%	None Detected	

**Client Sample ID:** 10b **Lab Sample ID:** 551708922-0033  
**Sample Description:** Red Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	8/14/2017	Orange	0%	100%	None Detected	

**Client Sample ID:** 10c **Lab Sample ID:** 551708922-0034  
**Sample Description:** Red Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	8/14/2017	Orange	0%	100%	None Detected	

**Client Sample ID:** 11a **Lab Sample ID:** 551708922-0035  
**Sample Description:** White Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 11b **Lab Sample ID:** 551708922-0036  
**Sample Description:** White Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 11c **Lab Sample ID:** 551708922-0037  
**Sample Description:** White Vinyl Floor Tiles - Studio B Kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 12a **Lab Sample ID:** 551708922-0038  
**Sample Description:** Beige Vinyl Floor Tiles - 1st Floor Maintenance Closet

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	8/14/2017	Beige	0%	100%	None Detected	

**Client Sample ID:** 12b **Lab Sample ID:** 551708922-0039  
**Sample Description:** Beige Vinyl Floor Tiles - 1st Floor Maintenance Closet

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	8/14/2017	Beige	0%	100%	None Detected	



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Customer ID: 55SELI62  
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Project ID:

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

**Client Sample ID:** 12c **Lab Sample ID:** 551708922-0040  
**Sample Description:** Beige Vinyl Floor Tiles - 1st Floor Maintenance Closet

TEST	Analyzed	Color	Non-Asbestos		Asbestos	Comment
	Date		Fibrous	Non-Fibrous		
PLM	8/14/2017	White	0%	100%	None Detected	

**Client Sample ID:** 13a **Lab Sample ID:** 551708922-0041  
**Sample Description:** Grey Vinyl Floor Tiles w/Black & White Streaks - Basement

TEST	Analyzed	Color	Non-Asbestos		Asbestos	Comment
	Date		Fibrous	Non-Fibrous		
PLM	8/14/2017	Beige	0%	100%	None Detected	

**Client Sample ID:** 13b **Lab Sample ID:** 551708922-0042  
**Sample Description:** Grey Vinyl Floor Tiles w/Black & White Streaks - Basement

TEST	Analyzed	Color	Non-Asbestos		Asbestos	Comment
	Date		Fibrous	Non-Fibrous		
PLM	8/14/2017	Beige	0%	100%	None Detected	

**Client Sample ID:** 13c **Lab Sample ID:** 551708922-0043  
**Sample Description:** Grey Vinyl Floor Tiles w/Black & White Streaks - Basement

TEST	Analyzed	Color	Non-Asbestos		Asbestos	Comment
	Date		Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	0%	100%	None Detected	

**Client Sample ID:** 14a **Lab Sample ID:** 551708922-0044  
**Sample Description:** Grey Vinyl Floor Tiles - Stairwell

TEST	Analyzed	Color	Non-Asbestos		Asbestos	Comment
	Date		Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	0%	100%	None Detected	

**Client Sample ID:** 14b **Lab Sample ID:** 551708922-0045  
**Sample Description:** Grey Vinyl Floor Tiles - Stairwell

TEST	Analyzed	Color	Non-Asbestos		Asbestos	Comment
	Date		Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	0%	100%	None Detected	

**Client Sample ID:** 14c **Lab Sample ID:** 551708922-0046  
**Sample Description:** Grey Vinyl Floor Tiles - Stairwell

TEST	Analyzed	Color	Non-Asbestos		Asbestos	Comment
	Date		Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray/White	0%	100%	None Detected	

**Client Sample ID:** 15a **Lab Sample ID:** 551708922-0047  
**Sample Description:** Stucco Ceiling - Basement Electrical Room

TEST	Analyzed	Color	Non-Asbestos		Asbestos	Comment
	Date		Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	0%	100%	None Detected	



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 Customer PO: 168617  
 Project ID:

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

**Client Sample ID:** 15b **Lab Sample ID:** 551708922-0048  
**Sample Description:** Stucco Ceiling - Basement Electrical Room

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	0%	100%	None Detected	

**Client Sample ID:** 15c **Lab Sample ID:** 551708922-0049  
**Sample Description:** Stucco Ceiling - Basement Boiler Room

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	0%	100%	None Detected	

**Client Sample ID:** 16a **Lab Sample ID:** 551708922-0050  
**Sample Description:** 2x4 Lay In Ceiling Tiles (Fissure/Pinhole) - 2nd Floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	75%	25%	None Detected	

**Client Sample ID:** 16b **Lab Sample ID:** 551708922-0051  
**Sample Description:** 2x4 Lay In Ceiling Tiles (Fissure/Pinhole) - 2nd Floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Gray	75%	25%	None Detected	

**Client Sample ID:** 16c **Lab Sample ID:** 551708922-0052  
**Sample Description:** 2x4 Lay In Ceiling Tiles (Fissure/Pinhole) - 2nd Floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Brown	80%	20%	None Detected	

**Client Sample ID:** 17a **Lab Sample ID:** 551708922-0053  
**Sample Description:** Insulation Paper on Columns - Studio A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Green/Beige	75%	25%	None Detected	

**Client Sample ID:** 17b **Lab Sample ID:** 551708922-0054  
**Sample Description:** Insulation Paper on Columns - Studio A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Beige	80%	20%	None Detected	

**Client Sample ID:** 17c **Lab Sample ID:** 551708922-0055  
**Sample Description:** Insulation Paper on Columns - Studio A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Brown	85%	15%	None Detected	



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EMSL Canada Order 551708922  
Customer ID: 55SELI62  
Customer PO: 168617  
Project ID:

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

**Client Sample ID:** 18a **Lab Sample ID:** 551708922-0056  
**Sample Description:** Roofing Membrane

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Black	20%	80%	None Detected	

**Client Sample ID:** 18b **Lab Sample ID:** 551708922-0057  
**Sample Description:** Roofing Membrane

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Black	25%	75%	None Detected	

**Client Sample ID:** 18c **Lab Sample ID:** 551708922-0058  
**Sample Description:** Roofing Membrane

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Black	20%	80%	None Detected	

**Client Sample ID:** 19a **Lab Sample ID:** 551708922-0059  
**Sample Description:** Roofing Underlay

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Black	45%	55%	None Detected	

**Client Sample ID:** 19b **Lab Sample ID:** 551708922-0060  
**Sample Description:** Roofing Underlay

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Black	45%	55%	None Detected	

**Client Sample ID:** 19c **Lab Sample ID:** 551708922-0061  
**Sample Description:** Roofing Underlay

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	8/14/2017	Black	60%	40%	None Detected	

**Client Sample ID:** 20a **Lab Sample ID:** 551708922-0062  
**Sample Description:** White Exterior Window Frame Caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	8/12/2017	Gray	0.0%	100%	None Detected	

**Client Sample ID:** 20b **Lab Sample ID:** 551708922-0063  
**Sample Description:** White Exterior Window Frame Caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	8/12/2017	Gray	0.0%	100%	None Detected	



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Customer ID: 55SELI62  
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Project ID:

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

**Client Sample ID:** 20c **Lab Sample ID:** 551708922-0064  
**Sample Description:** White Exterior Window Frame Caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	8/12/2017	Gray	0.0%	100%	None Detected	

**Client Sample ID:** 21a **Lab Sample ID:** 551708922-0065  
**Sample Description:** Brown Caulking on Flashing

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	8/12/2017	Brown	0.0%	100%	None Detected	

**Client Sample ID:** 21b **Lab Sample ID:** 551708922-0066  
**Sample Description:** Brown Caulking on Flashing

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	8/12/2017	Brown	0.0%	100%	None Detected	

**Client Sample ID:** 21c **Lab Sample ID:** 551708922-0067  
**Sample Description:** Brown Caulking on Flashing

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	8/12/2017	Brown	0.0%	100%	None Detected	

### Analyst(s):

- Anne Balayboa PLM (20)
- John Biesiadecki PLM Grav. Reduction (6)
- Natalie D'Amico PLM (39)

### Reviewed and approved by:

Matthew Davis  
or Other Approved Signatory

Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

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

Initial report from: 08/14/2017 17:14:58

# **Appendix C**

**Laboratory Certificate of Analysis - Lead**

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**EMSL Canada Inc.**

2756 Slough Street, Mississauga, ON L4T 1G3  
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<http://www.EMSL.com> [torentolab@emsl.com](mailto:torentolab@emsl.com)

EMSL Canada Or 551708954  
CustomerID: 55SELI62  
CustomerPO: 168617  
ProjectID:

**Joshua Cinello**  
**Safetech Environmental**  
**3045 Southcreek Road**  
**Unit 14**  
**Mississauga, ON L4X 2X7**

Phone: (905) 624-2722  
Fax: (905) 624-4306  
Received: 08/10/17 5:30 PM  
Collected:

Project: 276 Main St - 168617

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

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
L-01	551708954-0001 Site: White paint		8/14/2017	<0.0090 % wt
L-02	551708954-0002 Site: Grey paint		8/14/2017	<0.0090 % wt

Rowena Fanto, Lead Supervisor  
or other approved signatory

\*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Modifications of modifications are available upon request.

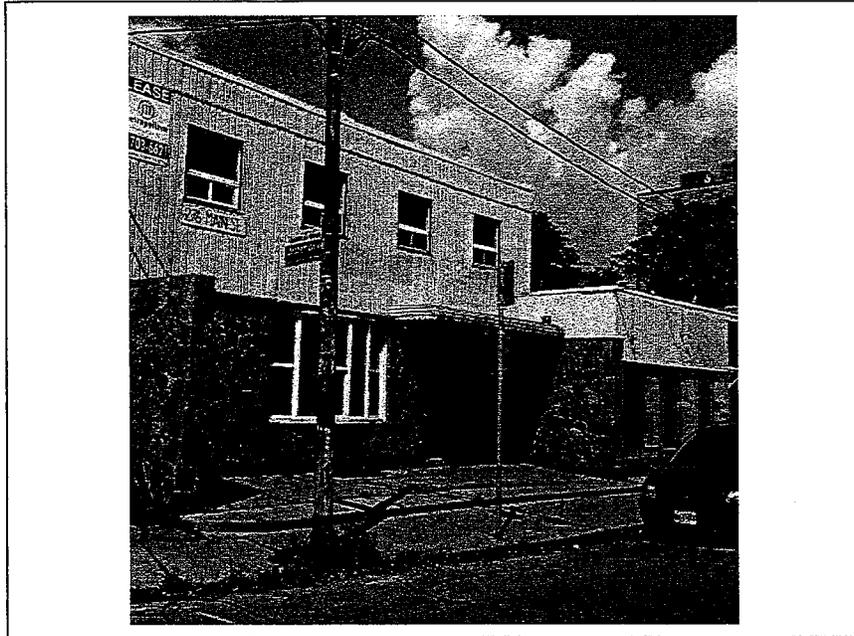
Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 08/15/2017 11:59:02

# **Appendix D**

## **Site Photographs**

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**P1 –**

Typical view of building exterior (west facing).

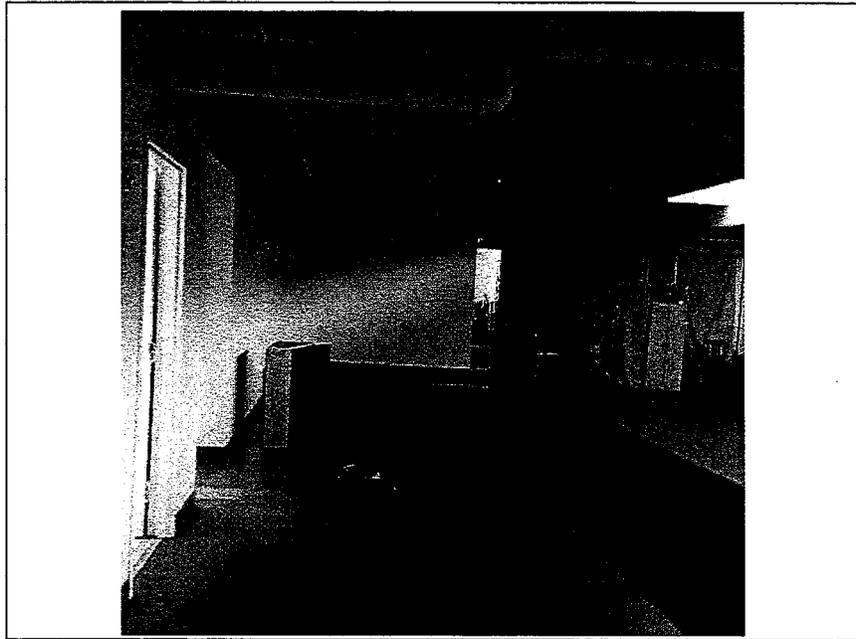
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**P2 – Basement**

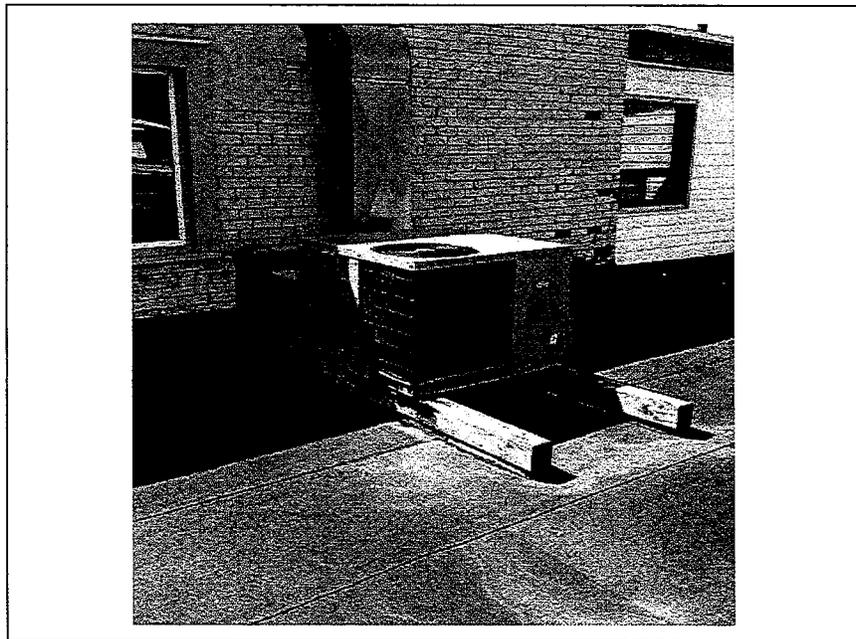
View of mould growth on drywall ceiling within basement.

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**P3 – Studio A**

View within Studio A where 12x12 light brown vinyl floor tiles around the perimeter were confirmed to contain 2% Chrysotile asbestos.



**P4 – Rooftop**

View of air conditioning unit on rooftop.

# **Appendix E**

## **Background Information on Designated Substances and Other Hazardous Materials**

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## **DESIGNATED SUBSTANCES**

The Occupational Health and Safety Act of Ontario (OHSA) allows for certain toxic substances to be especially designated. The OHSA defines a designated substance as “a biological, chemical or physical agent or combination thereof prescribed as a designated substance to which the exposure of a worker is prohibited, regulated, restricted, limited or controlled.” Ontario Regulation 490/09 - Designated Substances (O.Reg. 490/09), made under the Occupational Health and Safety Act outlines required steps to control exposure of workers to designated substances. Under O.Reg. 490/09 there are eleven (11) designated substances; acrylonitrile, arsenic, asbestos, benzene, coke oven emissions, ethylene oxide, isocyanates, lead, mercury, silica and vinyl chloride. This regulation applies to every employer and worker at a workplace where the designated substances are present, produced, processed, used, handled or stored and at which a worker is likely to be exposed to the designated substance.

Section 14 of O.Reg. 490/09 exempts an employer and the workers of an employer who engage in construction from the requirements of the regulation. However, designated substances are still required to be identified prior to the beginning of a demolition or renovation project to ensure that construction workers (and potentially building occupants) are adequately protected from the hazards posed by the presence of these materials if the planned work may cause them to be disturbed. Accordingly, under Section 30 of the OHSA building owners are required to perform an assessment to determine whether any designated substances are present at the project site before the beginning of the project. The owner is also required to prepare a list of designated substances that are present at the site and provide this list to prospective constructors before entering into a binding contract with the constructor. This way, contractors and construction workers are made aware of designated substances present within the work area so that appropriate measures can be taken during the work to limit exposure to these substances.

Designated Substances and Hazardous Materials Assessments are conducted to conform to the requirements of Section 30 of the OHSA. The assessments are performed to identify designated substances (and other hazardous materials) within the work area that may present a hazard to workers if disturbed. These substances are commonly a component of building materials or equipment found in buildings. Additional information regarding the eleven designated substances including their properties, uses and health effects are provided below.



### **Acrylonitrile**

Acrylonitrile (ACN) is a clear, colourless or pale yellow liquid with a pungent onion- or garlic-like, irritating odour. It is highly flammable and as such is a severe fire and explosion hazard.

Acrylonitrile is used mainly as a monomer or comonomer in the production of acrylic fibres, plastics, resins and nitrile rubbers. Historically, a mixture of acrylonitrile and carbon tetrachloride was used as a pesticide; however, all pesticide uses have stopped. Based on its use as a chemical intermediate, exposure to acrylonitrile is primarily occupational, via inhalation during its manufacture and use. Therefore, this designated substance is not expected to be encountered in buildings where it is not either produced or used in a manufacturing process.

Acute (short-term) exposure of workers to acrylonitrile has been observed to cause mucous membrane irritation, headaches, dizziness, and nausea. More significant exposures may lead to symptoms such as limb weakness, labored and irregular breathing, impaired judgment, cyanosis, collapse, and convulsions. Exposure of the skin to high concentrations of acrylonitrile in the air may irritate the skin and cause it to turn red while direct skin contact with acrylonitrile may cause the skin to blister and peel. The International Agency for Research on Cancer (IARC) concluded that there is inadequate evidence in humans for the carcinogenicity of acrylonitrile, but has classified it as possibly carcinogenic to humans (Group 2B).

### **Arsenic**

Arsenic is a naturally occurring mineral, widely distributed in the earth's crust. Elemental arsenic (sometimes referred to as metallic arsenic) is a silver-gray or white brittle metal. However, arsenic is usually found in the environment combined with other elements such as oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic has no odor and is almost tasteless.

Arsenic and its compounds have a variety of commercial uses. Inorganic arsenic compounds are mainly used as a wood preservative. Copper chromated arsenic (CCA) is used to make "pressure-treated" lumber. CCA-treated wood is no longer used for residential applications but may still be used in industrial applications. Arsenic is also used in metallurgy for hardening copper, lead and certain metal alloys, in pigment production, in the manufacture of certain types of glass, and in semiconductors and light-emitting diodes. Inorganic arsenic compounds are no longer used as pesticides in agriculture; however, organic arsenic compounds, namely cacodylic acid, disodium methylarsenate (DSMA), and monosodium methylarsenate (MSMA), are used, as yet, as pesticides – principally on cotton.



Today, workplace exposure to arsenic may still occur in some occupations that use arsenic, such as copper or lead smelting, wood treating, or pesticide application. Exposure to arsenic within buildings other than where it is used as part of the manufacturing process is unlikely and therefore arsenic is not expected to be encountered as part of a routine hazardous building materials assessment.

Human exposure to arsenic can cause both short and long term health effects. Short-term or acute effects can occur within hours or days of exposure. If you breathe high levels of inorganic arsenic, then you are likely to experience a sore throat and irritated lungs. Longer exposure at lower concentrations can lead to skin effects (such as darkened patches of skin and areas of thickened skin), and also to circulatory and peripheral nervous disorders. An important concern is the ability of inhaled inorganic arsenic to increase the risk of cancer. Long term exposure to arsenic has been linked to cancer of the bladder, lungs, skin, kidneys, nasal passages, liver and prostate. The IARC classifies arsenic and arsenic compounds as "carcinogenic to humans" (Group 1).

### **Asbestos**

Asbestos is the name given to a number of naturally occurring fibrous minerals found in the environment. Ontario Regulation 490/09 (Designated Substances) defines asbestos as any one of the following fibrous silicates: actinolite; amosite; anthophyllite; chrysotile; crocidolite; and tremolite. Asbestos fibres have several desirable characteristics such as high textile strength, the ability to be spun and woven, and resistance to heat and most chemicals. These characteristics have resulted in the historical use of asbestos in a wide variety of building materials and other manufactured goods. Examples of products where asbestos has been used include roofing shingles, ceiling and floor tiles, insulation, sprayed fireproofing, gaskets, and friction products such as automotive brakes and clutches.

The peak years for asbestos use were in the 1960s and early 1970s. Therefore, asbestos is commonly found in building materials of this era. The use of asbestos in building materials and other products has decreased significantly since this time. Friable asbestos-containing materials (material that when dry can be crumbled, pulverized or powdered by hand pressure), such as sprayed fireproofing and sprayed insulation, ceased use circa 1973. Mechanical thermal system insulation ceased use circa 1981 while sprayed acoustic texture coat finishes ceased use circa 1982. Non-friable asbestos-containing materials were generally manufactured for a longer period of time (with the exception of plaster finishes which ceased use circa 1960's). Asbestos-containing drywall joint compound ceased use circa 1980. Vinyl floor tiles, vinyl sheet flooring and acoustic ceiling tile ceased use 1982. Other non-friable materials continued to be produced into the 1990's, including roofing materials (ceased use circa 1991) and floor adhesives (ceased use circa 1992). Today, asbestos is a controlled substance, and is banned for use in most products sold in Canada under the Hazardous



Products Act (with the exception of certain roof shingles, clutch facings and brake linings).

Potentially harmful exposure to asbestos occurs through inhalation of air containing asbestos fibres. The greatest risk for workplace exposure to airborne asbestos is in occupations that produce and use asbestos, such as in mining and milling operations or in the manufacture of products containing asbestos. Exposure to airborne asbestos fibres may also occur to construction workers, trades people, maintenance workers and other building occupants in buildings constructed with asbestos-containing materials; especially during building renovations or repairs or if the materials are in poor condition or are otherwise disturbed.

Health risks associated with asbestos exposure are dependent on several factors such as the type and airborne concentration of asbestos, and period of exposure. In general, the greater the exposure to asbestos, the greater the chance of developing harmful health effects. Typically, chronic, daily exposure to elevated airborne concentrations of asbestos over a period of years is required for health effects to eventually manifest themselves. Health effects associated with exposure to asbestos can result in asbestosis (a scarring of the lungs which makes breathing difficult), mesothelioma (a rare cancer of the lining of the chest or abdominal cavity) and lung cancer. The link between exposure to asbestos and other types of cancers and health effects is less clear.

### **Benzene**

Benzene is a clear, colourless liquid with a characteristic, sweet or aromatic hydrocarbon odour. It is a liquid at room temperature but evaporates into the air very quickly, making it a highly flammable vapour as well as an extremely flammable liquid.

Benzene is formed from both natural processes and human activities. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke. It is produced from petroleum and coal sources and is used mainly in the manufacture of other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides.

Exposure to pure benzene within buildings other than where it is produced or used as part of a manufacturing process is unlikely. Therefore benzene is not expected to be encountered as part of a routine hazardous building materials assessment.

Exposure to benzene primarily occurs through inhalation of airborne vapours. Short-term (acute) health effects associated with overexposure to benzene vapours can result in symptoms such as headache, nausea, dizziness, drowsiness and confusion, with unconsciousness or even death at very high levels. Long-term (chronic) exposure to



Benzene may cause blood and bone marrow effects which can lead to anemia and leukemia (cancer of the blood-forming organs) as well as cause damage to the immune system, increasing the chance for infection. The IARC classifies benzene as "carcinogenic to humans" (Group 1).

### **Coke Oven Emissions**

Coke Oven Emissions refers to the benzene soluble fraction of total particulate matter emitted during the destructive distillation or carbonization of coal for the production of coke (pure carbon). These emissions are a mixture of coal tar, coal tar pitch, volatiles (including benzene, toluene and xylene), creosote, polycyclic aromatic hydrocarbons (PAHs – including benzo(a)pyrene, benzanthracene, chrysene and phenanthrene), and metals (including cadmium, arsenic, beryllium and chromium). Condensed coke oven emissions are a brownish, thick liquid or semisolid with a naphthalene-like odor, while uncondensed coke oven emissions are vapors that escape when the ovens are changed and emptied and are a component of fugitive emissions.

The coke produced is used as a component in the manufacturing of iron and steel. Coke is also used to synthesize calcium carbide and to manufacture graphite and electrodes. Additional chemicals recovered from the coke oven emissions (such as benzene, toluene, naphthalene, sulfur, and ammonium sulfate) are used as raw materials for plastics, solvents, dyes, drugs, waterproofing, paints, pipecoating, roads, roofing, insulation, and as pesticides and sealants.

Coke oven emissions would only be present within facilities producing or using coke as part of the manufacturing process and thus occupational exposure is limited to those workers in the aluminum, steel, graphite, electrical, and construction industries. Therefore, coke oven emissions are not a contaminant of concern during a routine hazardous building materials assessment.

Chronic (long-term) exposure to coke oven emissions can result in chronic bronchitis (particularly those who smoke) and additional health effects such as conjunctivitis, severe dermatitis, and lesions of the respiratory system and digestive system. However, the greatest concern regarding chronic exposure to coke oven emissions is the increased risk of cancer. The IARC classifies coke production as "carcinogenic to humans" (Group 1). The site at which excess cancer rates have been identified most commonly among workers in coke production is the lung. Excess risk for kidney cancer has also been associated with work in coke plants. Additional studies have also reported excess risks for other types of cancers such as cancer of the large intestine and pancreas.



### **Ethylene Oxide**

Ethylene oxide is colourless gas with a somewhat sweet odour. It is extremely flammable and also dangerously reactive. Ethylene oxide exists as a compressed gas that has been produced since the early 1900s. It is used primarily as a chemical intermediate in the production of ethylene glycol, glycol ethers, nonionic surfactants and other industrial chemicals. Much smaller amounts are used as a non-explosive mixture with nitrogen or carbon dioxide for sterilizing medical instruments and supplies in hospitals and industrially for the fumigation of spices.

Most people are not likely to be exposed to ethylene oxide because it is not commonly found in the environment. Exposure to ethylene oxide is generally limited to those facilities where it is made or used. Therefore, ethylene oxide is not a contaminant of concern during a routine hazardous building materials assessment, although the presence of it should be determined in buildings such as hospitals if construction activities are to occur in or adjacent to areas where it is used or stored.

Exposure to ethylene oxide can result in irritation to the skin or eyes; however, the greatest risk for health effects is through inhalation. This can result in irritation to the nose, throat and respiratory tract, with damage to the central nervous system at higher concentrations. Exposure to high concentrations may cause headache, nausea, dizziness, drowsiness, and incoordination. Exposure to ethylene oxide is also a cancer hazard and possible reproductive hazard. In epidemiological studies of exposure to ethylene oxide, the most frequently reported association has been with lymphatic and haematopoietic cancer. The IARC has concluded that there is limited evidence for the carcinogenicity of ethylene oxide in humans and sufficient evidence for carcinogenicity in experimental animals, classifying ethylene oxide as "carcinogenic to humans" (Group 1).

### **Isocyanates**

Isocyanates are a family of highly reactive, low molecular weight, manufactured chemicals containing one or more isocyanate groups (-NCO). An isocyanate that has two isocyanate groups is known as a diisocyanate, which are the most common type of isocyanates used for manufacturing other products. The most commonly used diisocyanates include methylene diphenyl diisocyanate (MDI), toluene diisocyanate (TDI), and hexamethylene diisocyanate (HDI).

When isocyanates are combined with other compounds that contain free hydroxyl functional groups (i.e. -OH) they react and begin to form polyurethane polymers. These polyurethanes find significant application in the manufacture of rigid and flexible foams. Flexible foam is primarily used for cushioning, while rigid foam is used mainly for insulation. Polyurethanes are also used in the production of adhesives, elastomers, and



coatings and are increasingly used in the automobile industry, autobody repair, and building insulation materials.

This diversity of applications means that exposures to isocyanates can occur in a broad range of production facilities from small workshops to automated production lines. Jobs that may involve exposure to isocyanates include painting, foam-blowing, and the manufacture of many polyurethane products. Exposure to isocyanates within buildings where it is not produced or used as part of manufacturing is unlikely, as products such as rigid foam insulation that may be used in buildings has already undergone the curing process. Completely cured products are fully reacted and therefore are considered to be inert and non-toxic. However, some products such as spray foams, coatings, sealants and adhesives may be sold and used in an uncured form. An example would be an adhesive, which is sold to be initially applied in an uncured form and as it cures (hardens), bonds two pieces of wood together. Such products can provide potential exposure to building occupants and construction workers during the application and use of these products. However, for the purposes of a routine hazardous building materials assessment, products that may have contained isocyanate as part of the manufacturing process (e.g. rigid foam) or during the application/installation process (e.g. spray foam, adhesives and sealants) are assumed to be fully cured and would no longer contain free isocyanate.

Direct skin contact with isocyanates can cause marked skin irritation, resulting in reddening, swelling and blistering. However the greatest route of exposure to isocyanates is through inhalation of fine vapours or droplets. Airborne exposure to isocyanates can result in irritation to the mucous membranes of the eyes and respiratory tracts. This results in symptoms such as excessive tear secretion, dry throat, dry cough, chest pains and difficulty in breathing. Isocyanates are also a major cause of work-related asthma worldwide. Increased exposure to isocyanates can lead to sensitization. Once sensitized, individuals are subject to severe asthma attacks (which in some cases has been reported to result in death) if they are re-exposed.

### **Lead**

Lead is a naturally occurring metal found in small amounts in the earth's crust. It is usually found in ore with zinc, silver and (most abundantly) copper, and is extracted together with these metals. Metallic lead is bluish-white in colour but soon tarnishes to a dull grey when exposed to air. When melted into liquid form it has a shiny chrome-silver appearance.

Lead is soft, dense, highly malleable and resistant to corrosion, with poor electrical conductivity as compared to most other metals. Such properties have resulted in lead being used in many applications, including products and materials commonly found in buildings. It is present as a component of lead-acid batteries, ammunition, PVC plastics, and older brass and chrome-plated brass faucets. As a building component,



lead has been used in water distribution piping, as an alloy in solder, in electrical conduits, roofs and roofing details, and as an additive to paints, ceramic glazes and mortars as pigments or for anti-corrosion properties. Lead has also used as sheeting inside buildings for shielding X-rays and for sound attenuation.

Exposure to lead can occur for workers in workplaces that produce the above materials but also to construction workers, building maintenance personnel and the general population due to the widespread historical use of lead in building materials and consumer products. Most exposure to lead occurs through ingestion or inhalation, with the health effects being the same. Overexposure to lead can result in damage to nervous connections and can cause blood and brain disorders, severe damage to the kidneys and ultimately death. Infants and young children are especially vulnerable to the health effects of lead, as overexposure has been proven to result in the permanent reduction in cognitive capacity. In pregnant women, high levels of exposure to lead may cause miscarriage. The IARC has concluded that lead and inorganic lead compounds are "possibly carcinogenic to humans" (Group 2B).

The known serious health effects associated with lead exposure has brought about widespread reduction in its use. The use of lead in building materials and consumer products has decreased substantially since the 1970s to where lead is no longer being used in building materials and consumer products or is present at significantly lower concentrations. For example, unleaded gasoline was introduced in Canada in 1975, after which leaded gasoline was phased out and banned in 1990. Lead-based solder has been banned since the 1980s and most solder used today is either lead-free or has very low lead concentrations. Up until the 1960s, lead was added to paints in significant quantities. Since that time, the concentration of lead in paint has decreased. The federal government began reducing the amount of lead allowed in interior paint in 1976 (to 0.5% by weight). By 1991, paint manufacturers in Canada and the U.S. voluntarily stopped adding lead to paint, reducing lead concentrations to background levels. In 2005 the *Surface Coating Materials Regulations* came into effect to limit the concentration of lead in paint (to 0.06% by weight) for both interior and exterior paints sold to consumers. This was since amended in 2011 to further reduce the allowable lead limit (to 0.009% by weight) and extended to include all consumer paints and coatings.

### **Mercury**

Mercury is a naturally occurring element found in the earth's crust, with natural deposits generally found as a vermilion red ore called cinnabar. Mercury can exist as metallic mercury, organic mercury or inorganic mercury. Metallic or elemental mercury has unique properties as compared to other metals. It is the only pure metal that is a liquid at room temperature, having a silvery-white, shiny appearance. Mercury is the densest liquid known, which produces a colourless, odourless vapour at room temperature.



The unique properties of mercury have resulted in it being used in a wide variety of applications. Properties such as its coefficient of expansion and ability to conduct electricity has resulted in mercury being used in thermometers, barometers and other measuring devices (blood pressure gauges, vacuum gauges, manometers, etc.), thermostats and a variety of other electrical switches (temperature sensitive, tilt switches, float switches, etc.). Mercury is also used in antifouling paints, dry cell or button batteries and numerous lighting products, including fluorescent lamps and a variety of High Intensity Discharge (HID) lamps such as mercury vapor, metal halide and high pressure sodium lamps. HID lamps are used for street lights, floodlights and industrial lighting applications. Because of the wide variety of uses mercury can be found as a component of machinery, equipment and lighting within buildings; although many of its uses have been phased out over the years.

The health effects of mercury exposure depend on its chemical form (elemental, inorganic or organic), the route of exposure (inhalation, ingestion or skin contact), and the level of exposure. Vapours from liquid elemental mercury and methyl mercury are more easily absorbed than inorganic mercury salts and can, therefore, cause more harm. Exposure to mercury occurs mainly from breathing contaminated air or ingesting contaminated water and food. Mercury is a neurotoxin, which means it can adversely affect the central nervous system. Upon exposure, mercury tends to accumulate quickly in the brain where it tightly binds with the tissue and is released at a very slow rate. The nervous system effects of mercury toxicity are sometimes referred to as "Mad Hatter's Disease" since mercurous nitrate was used in making felt hats. High levels of exposure to mercury can also lead to harmful effects on the digestive and respiratory systems, and the kidneys. Many mercury compounds may also be teratogenic or capable of causing birth defects.

Mercury compounds can also be toxic at low levels in the environment. The characteristics of mercury that make it an environmental problem are its toxicity and persistence in the environment, and its ability to accumulate and bioconcentrate as methyl mercury in fish and fish-eating predators such as large fish or loons. Therefore, proper disposal of mercury-containing materials is essential. The improper disposal of mercury-containing products such as fluorescent light bulb tubes, high intensity discharge lamps, mercury vapour lamps, mercury thermometers and thermostats can lead to the release of mercury from municipal landfills. Used fluorescent and HID lamps may be classified as hazardous waste due to their mercury content and should be recycled if possible rather than being disposed of in landfill.

### **Silica**

Silica (silicon dioxide) is the name of a group of minerals that contain silicon and oxygen in a chemical combination and have the general formula  $\text{SiO}_2$ . It is one of the most common minerals in the earth's crust. Silica can be present as crystalline silica (free silica) or amorphous silica (combined silica), and exists in many forms. The three most



common crystalline forms of silica encountered in the workplace environment are quartz, tridymite, and cristobalite. Quartz is by far the most common crystalline silica found in nature, being abundant in most rock types, notably granites, sandstones, quartzites and in sands and soils. Cristobalite and tridymite are found in volcanic rocks. Amorphous silica is found in nature as biogenic silica and as silica glass of volcanic origin. One form of biogenic silica, diatomaceous earth, originates from the skeletons of diatoms deposited on sea floors. From a health perspective it is the crystalline silica forms that raise the biggest concerns.

Silica is present in numerous building materials and products, including concrete, brick, stone, terrazzo, refractory brick, etc. Low concentrations of silica are also possible in plaster, drywall, acoustical ceiling tiles, drywall joint compound, mortars and adhesives. Because of the wide usage of quartz-containing materials, workers may be exposed to crystalline silica in a large variety of industries and occupations. Occupational exposure to silica dust occurs in cement and brick manufacturing, asphalt pavement manufacturing, china and ceramic manufacturing and the tool and die, steel and foundry industries. Exposure to silica also occurs during many different construction and maintenance activities. The most severe exposures to crystalline silica result from abrasive blasting activities using silica sand. Other activities that may produce crystalline silica dust include jack hammering, rock/well drilling, concrete mixing, concrete drilling, tuck pointing, and brick and concrete block cutting and sawing. Additionally, crystalline silica exposures occur in the maintenance, repair and replacement of refractory brick furnace linings.

Adverse health effects associated with silica exposure result from inhalation of the respirable fraction of crystalline silica, which can arise from many of the activities outlined above. The main health effects associated with silica exposure are lung cancer and silicosis. The IARC has concluded that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is "carcinogenic to Humans" (Group 1). Silicosis is caused by scarring of the lung tissue from breathing in silica dust. This scarring is permanent and causes a reduction in the lungs' ability to take in oxygen, making it difficult to breathe and in severe cases can be disabling, or even fatal. Since silicosis affects lung function, it also makes one more susceptible to lung infections like tuberculosis.

### **Vinyl Chloride**

Vinyl chloride is a manufactured substance that does not occur naturally. It is used as a chemical intermediate and not an end product. Vinyl chloride exists in liquid form if kept under high pressure or at low temperatures. At room temperature, it is a colourless gas. It burns easily and is not stable at high temperatures.

Most of the vinyl chloride produced is used to make a polymer called polyvinyl chloride (PVC). PVC is used to make a variety of plastic products including pipes, wire and



cable coatings, vinyl flooring, vinyl wallpaper and window frames. It is also used to make furniture, upholstery and packaging materials. One of the concerns regarding PVC is that upon burning it will emit toxic fumes. Contaminants emitted when PVC is burned include hydrochloric acid, carbon monoxide and carbon dioxide, along with lesser amounts of dioxin and furan.

Vinyl chloride is reported to be slightly irritating to the eyes and respiratory tract in humans. Central nervous system effects (including dizziness, drowsiness, fatigue, headache, visual and/or hearing disturbances, memory loss, and sleep disturbances) as well as peripheral nervous system symptoms (peripheral neuropathy, tingling, numbness, weakness, and pain in fingers) have been reported in workers exposed to vinyl chloride. Short-term (acute) exposure to extremely high levels of vinyl chloride has also reportedly caused loss of consciousness, lung and kidney irritation, and inhibition of blood clotting in humans. The most significant health effect associated with exposure to vinyl chloride is that it is a known human carcinogen that causes a rare cancer of the liver. It has been classified by the IARC as "carcinogenic to humans" (Group 1). Brain cancer, lung cancer, and some cancers of the blood also may be connected with breathing vinyl chloride over long periods.

## **OTHER HAZARDOUS MATERIALS**

### **CHEMICAL HAZARDS**

#### **Urea Formaldehyde Foam Insulation**

Urea-formaldehyde foam insulation (UFFI) was developed in as an improved means of insulating difficult-to-reach cavities. It was typically made at the construction site from a mixture of urea-formaldehyde resin, a foaming agent and compressed air. When the mixture is injected into the wall, urea and formaldehyde unite and "cure" into an insulating foam plastic. Its appearance is like ordinary shaving cream. Dry, it can be a white or tan colour, and fluffy like styrofoam. Over time UFFI shrinks significantly and may begin to degrade due to its crumbly texture.

UFFI was installed primarily in wall cavities during the 1970's as an energy conservation measure. The insulation was used most extensively from 1975 to 1978, during the period of the Canadian Home Insulation Program (CHIP), when financial incentives were offered by the government to upgrade home insulation levels. In addition to detached homes it can be found in common areas and walls of semi-detached homes, apartment buildings and condominiums. UFFI was also used to a lesser degree in some commercial and industrial buildings.

UFFI installation has been banned in Canada under the Hazardous Products Act (HPA) since December, 1980 due to concerns regarding the health effects of exposure to formaldehyde. Formaldehyde is a colourless, pungent-smelling gas. Health effects



include eye, nose, and throat irritation; wheezing and coughing; fatigue; skin rash; nausea; headache; dizziness; and severe allergic reactions.

Sometimes, a slight excess of formaldehyde was often added to ensure complete "curing" with the urea to produce the urea-formaldehyde foam. The excess formaldehyde was given off after installation during the initial curing process, which typically took a few days to a week to complete. UFFI was sometimes improperly installed or used in locations where it should not have been, resulting in continued off-gassing of formaldehyde past the initial curing stage. Since UFFI was last installed in 1980, it should have little effect on indoor formaldehyde levels today. However, if UFFI comes in contact with water or moisture, it could begin to break down. Due to the age of the insulation UFFI may also begin to degrade and crumble into a fine powder. Under these conditions UFFI may release more formaldehyde and consideration should be given to removing the material using properly trained remediation personnel.

## **BIOLOGICAL HAZARDS**

### **Mould**

Mould is part of the fungi kingdom, which also includes mushrooms and yeasts. They are a naturally occurring and essential part of our environment since they break down dead organic material in the outdoor environment (such as leaves, wood and other plant debris), which they use as a food source.

Mould reproduces by means of tiny spores that are so small they can't be seen by the naked eye. Because of their small size mould spores easily become airborne and can travel long distances, entering indoor environments through ventilation systems, open windows or doors, or tracked in on footwear. Therefore, mould spores are a commonly detected in indoor air and as a component of settled dust.

Under normal conditions, the presence of indoor mould is not an issue. However, if conditions exist that allow it to grow and multiply indoors it can become a potential hazard. Several factors will affect what moulds will grow within a building and how fast they will grow. This includes parameters such as temperature, airflow, and the pH (i.e. acidity/alkalinity) of the food substrate. However, the most important parameter affecting mould growth is water availability, as all moulds need some amount of moisture for them to be able to grow. Buildings that have had a history of water damage are at greater risk of indoor mould growth.

Indoor mould growth may present a risk to the building structure itself through decomposition of building materials. Health risks to building occupants may also occur as a result of indoor mould growth. Construction or renovation work which disturbs mould-contaminated materials increases this risk of exposure to building occupants and the construction workers themselves. Health effects associated with exposure to mould



most commonly results in allergic type reactions such as runny nose, cough, congestion, eye irritation and aggravation of asthma, headache and fatigue. Exposure to very high concentrations of airborne mould spores (such as those that may be observed during disturbance of mould-contaminated building materials) can result in more serious health effects such as Organic Dust Toxic Syndrome (ODTS) or Hypersensitivity Pneumonitis (HP), where flu-like symptoms (fever, chills, cough, fatigue, shortness of breath, body aches, etc.) are exhibited. The chronic form of HP may occur from long-term exposure to lower levels of mould and results in a continued worsening in shortness of breath or cough. A variety of species of mould have also been documented to cause serious invasive infections, which are generally limited to individuals whose immune systems are already somehow compromised.

### **Pest Infestation**

Areas currently or previously infested by pests (including birds, bats, rodents, raccoons, cockroaches, etc.) can result in potential exposure to numerous biological hazards that can be viral, bacterial, fungal or parasitic in nature. This can occur through exposure to their droppings, urine or saliva.

Bird and bat droppings should be presumed to be contaminated with the fungi *Histoplasma capsulatum* and/or *Cryptococcus neoformans*. These fungi grow well in the high nutrient content of accumulated bird and bat excrement and can cause respiratory infections in workers exposed during construction or maintenance activities that cause the droppings to be disturbed and the fungi to become airborne.

Histoplasmosis is an infectious disease caused by inhaling the spores of *Histoplasma capsulatum*. After an exposure, how ill a person becomes varies greatly and most likely depends on the number of spores inhaled and a person's age and susceptibility to the disease. The mildest form of histoplasmosis produces no signs or symptoms, but severe infections can cause serious problems throughout your body as well as in your lungs. Otherwise healthy people who've had intense exposure to *H. capsulatum* may experience a form of the disease known as acute symptomatic pulmonary histoplasmosis. Typical symptoms include fever, muscle aches, headache, dry cough, chest pain, sweating and loss of appetite.

Cryptococcosis is an infectious disease caused by inhaling the spores of *Cryptococcus neoformans*. Once inhaled, infection with cryptococcosis may go away on its own, remain in the lungs only, or spread throughout the body. Most cases occur to people with a weakened immune system, such as those with HIV infection, taking high doses of corticosteroid medications, cancer chemotherapy, or who have Hodgkin's disease. In people with a normal immune system, the lung (pulmonary) form of the infection may have no symptoms. In people with weakened immune systems, the *cryptococcus* organism may spread to the brain. Most people with this infection have



meningoencephalitis (swelling and irritation of the brain and spinal cord) when they are diagnosed.

Rodents such as deer mice may be infected with Hantavirus, which can be shed in their urine, saliva and droppings. Exposure to Hantavirus can result in a serious respiratory illness called hantavirus pulmonary syndrome (HPS). Initially, infected individuals exhibit flu-like symptoms, including fever and body aches which progresses to shortness of breath and coughing which rapidly becomes more severe. Exposure to Hantavirus in Canada is rare and Health Canada has only found the virus in a very small percentage of deer mice tested in Northern Ontario.

A raccoon latrine (i.e. an area where they repeatedly deposit fresh feces on top of old feces) may contain microscopic roundworm (*Baylisascaris procyonis*) eggs that can potentially be hazardous to human health. Once deposited in the environment, the eggs develop into an infectious form; and if inadvertently ingested by humans, the larvae hatch out of the eggs and may penetrate the body's organs. Larvae travel through the body and may cause serious eye disease, spinal cord or brain damage or death. Raccoon roundworm disease is not contracted by inhalation nor has any case of inhalation of roundworm eggs been documented.

Exposure to animal dander, scales, fur, urine, feces and saliva can also result in exposure to certain proteins that can act as allergens and can also cause asthmatic reactions. Some common sources of pest-related allergens include cockroaches, dust mites and rodents. The protein in urine from rats and mice is a potent allergen. Cockroach allergens are also potent and are derived from several sources, such as saliva, fecal material, secretions, cast skins, debris, and dead bodies. Allergic reactions occur when sensitized persons inhale, swallow or touch traces of the allergen, resulting in an exaggerated reaction of the body's immune system to the foreign protein. Typical allergic reactions result in nasal, eye, and throat irritation as well as possible skin hives. These proteins may also trigger asthma attacks when sensitive individuals inhale the proteins, resulting in symptoms such as coughing, wheezing, chest tightness, and breathing difficulties.

## **ENVIRONMENTAL HAZARDS**

### **Polychlorinated Biphenyls**

Polychlorinated biphenyls (PCBs) are a class of man-made organic chemicals known as chlorinated hydrocarbons. They vary in consistency from thin, light-coloured liquids to yellow or black waxy solids. They were manufactured in the United States from 1929 until their manufacture was banned in 1979. Although PCBs were not manufactured in Canada, they were imported from the U.S. over the years. Canada banned the import, manufacture and sale of PCBs in 1977.



PCBs are non-flammable, chemically stable over a wide range of temperature and physical conditions, not soluble in water, unaffected by acids, base or corrosive chemicals, and have a high dielectric or electrical insulating capacity. Due to these unique properties PCBs were used in hundreds of industrial and commercial applications, most commonly in electrical transformers and capacitors, including those capacitors found in light ballasts. They were also used as coolants, fire retardants and as insulation and in a number of other commercial applications including carbonless copy paper, dust suppressors for roads, hydraulic fluids, caulking compounds, plasticizers and lubricating oils and heat-transfer applications.

Although PCBs were found to be extremely useful in many industrial and commercial applications some of their chemical properties also made them an environmental and health hazard. PCBs are nearly indestructible and therefore persist if released into the natural environment. Their high fat and low water solubility result in a build-up (bioaccumulation) of PCBs in the fatty tissue of animals and humans if ingested/inhaled. Because PCBs persist in the fatty tissue of animals their concentration will tend to increase the higher up the food chain.

Most of what is known about the human health effects of PCBs is based on exposures due to accidental releases or job-related activities. These exposures are much higher than the levels normally found in the environment. The adverse health effects include a severe form of acne (chloracne), swelling of the upper eyelids, discolouring of the nails and skin, numbness in the arms and/or legs, weakness, muscle spasms, chronic bronchitis, and problems related to the nervous system. The International Agency for Research on Cancer (IARC) classifies PCBs as "probably carcinogenic to humans" (Group 2A) based on limited evidence that long-term, high-level occupational exposure can lead to increased incidence of liver and kidney cancers. The long-term impact of low-level exposures to PCBs that is common in the general population is unclear. The current state of knowledge suggests that low-level exposures to PCBs are unlikely to cause adverse health effects. However, people eating large amounts of certain sports fish, wild game and marine mammals are at increased risk for higher exposures and possible adverse health effects.

### **Ozone Depleting and Global Warming Substances**

There are several different types of chemicals that are being or have been used as refrigerants in commercial, home and vehicle air conditioners and refrigerators or as fire extinguishing agents in portable and fixed fire extinguishing equipment. This includes groups of chemical compounds known as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and halons. Some of these chemicals have also been used as foam blowing agents, as cleaning solvents for electrical components, as aerosol spray propellants, and in hospital sterilization procedures. Fixed halon fire extinguishing systems have historically been used in areas such as data centers, IT rooms, museums, libraries, surgical suites, and other locations where use of water-



based suppressants could irreparably damage electronics or vital archival collections. There is a large number of halon fire extinguishing systems still in service in Canada. The concern regarding past and present use of many of the chemicals used as refrigerants or fire extinguishing agents is that they are ozone-depleting substances (ODS). When released into the environment these chemicals break down in the stratosphere and release chlorine or bromine, which destroy the stratospheric ozone layer. The ozone layer screens the earth from some of the sun's harmful ultraviolet rays (UVB). As the ozone layer is depleted, higher UVB levels reach the earth, resulting in increased exposure to UVB. Increased exposure to UVB can cause skin cancer and plays a major role in malignant melanoma development. It can also increase the likelihood of cataracts and may also suppress proper functioning of the body's immune system and the skin's natural defences.

CFCs, HCFCs and halons are also known to be greenhouse gases and contribute to global warming due to the build-up of these heat-trapping gases in the atmosphere. Hydrofluorocarbons (HFCs) are a common replacement chemical for CFC and HCFC refrigerants; and although they do not have any ozone depleting potential they are a potent greenhouse gas.

Due to the ozone-depleting potential and/or global warming potential of CFCs, HCFCs, HFCs and halons it is important to control their use and emission into the environment. The manufacture and use of CFCs has stopped while transitional refrigerants (HCFCs) are scheduled to be phased out of production. No phase-out dates are currently planned for any HFCs. In Ontario, Regulation 463/10, "Ozone Depleting Substances and Other Halocarbons" (made under the Environmental Protection Act) enhances the control and management of substances that deplete the ozone layer and contribute to global warming. This regulation has requirements to prevent or minimize ozone-depleting substances and other halocarbons emissions, which serves a dual environmental benefit of lowering emissions that destroy the ozone layer and contribute to climate change.