Asbestos Management Plan
Carleton Condominium Corporation No. 6

55 Sumac Street, Ottawa, Ontario

Client:
Deerpark Management Limited
52-5450 Canotek Road
Ottawa, Ontario

Project Number
OTT-00211242-A0

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Date Submitted
April 8, 2013
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Executive Summary

It is Carleton Condominium Corporation No. 6’s policy to minimize/control asbestos exposure to all workers, volunteers, visitors, and contractors. This shall be done through assessments, repairs, removals, communication, training, record keeping and by following applicable legislation: Ontario Regulation 837/90 Regulation respecting Asbestos – made under the Occupational Health and Safety Act and Ontario Regulation 278/05 Regulation respecting Asbestos on Construction Projects and in Building and Repair Operations – made under the Occupational Health and Safety Act. All asbestos assessments, repairs and removals shall be approved and coordinated by the AMP Administrator who shall keep the staff and others informed as appropriate.

The purpose of this plan is to ensure the above noted regulations are followed and treated as a minimum standard at all times. This plan applies to the all individual residential units, the apartment buildings and individual apartments in those buildings and the recreational building in the condominium complex which is accessed via several driveways along Sumac Street and Elmsmere Road, Ottawa, Ontario.

To enforce their plan on asbestos, Carleton Condominium Corporation No. 6 has established an Asbestos Management Plan. Copies of the Asbestos Management Plan and training manuals are available for review with the Operations Manager.

Scientific and medical evidence has shown that asbestos-containing material can be harmful to the human body. The Asbestos Management document shows the amount of asbestos present in each building, as well as the specific locations of the asbestos. These actions will significantly reduce the impact that asbestos materials can have and thus continue to maintain the standard of safety that is expected of Carleton Condominium Corporation No. 6.
Table of Contents

Executive Summary ......................................................................................................................... EX-I

1. Background Information ........................................................................................................ 1
   1.1 Asbestos ............................................................................................................................. 1
   1.2 Uses of Asbestos in Building Materials ............................................................................. 1

2. Legislation Governing Asbestos Control .............................................................................. 2
   2.1 Introduction ....................................................................................................................... 2
   2.2 Legislation Requirements for a Management Program for Asbestos in Buildings .......... 2

3. Health Effects ........................................................................................................................... 4
   3.1 Health Effects Associated with Asbestos Exposure .......................................................... 4
   3.2 The Respiratory System ..................................................................................................... 4
   3.3 Asbestosis .......................................................................................................................... 5
   3.4 Lung Cancer ....................................................................................................................... 5
   3.5 Mesothelioma .................................................................................................................... 5
   3.6 Other Diseases ................................................................................................................... 5

4. Operations and Maintenance Program .................................................................................. 6
   4.1 Introduction ......................................................................................................................... 6
      4.1.1 Work Control/Permit System ......................................................................................... 6
      4.1.2 Use of Outside Contractors for Asbestos Abatement ................................................... 8
   4.2 Asbestos Records .............................................................................................................. 9
   4.3 Worker/Occupant Notification ............................................................................................ 9
   4.4 Asbestos Awareness Training ............................................................................................. 10
   4.5 Asbestos Worker/Handler Training (Two Days) ................................................................ 10
      4.5.1 Introduction ................................................................................................................ 10
      4.5.2 Worker Protection .................................................................................................... 11
   4.6 AMP Administrator Training (Two-Three Days) ............................................................ 12
   4.7 Cleaning Areas and Procedures ......................................................................................... 13
   4.8 Emergency Response Procedures ..................................................................................... 13
      4.8.1 Minor Release Episode ................................................................................................ 14
      4.8.2 Major Release Episode .............................................................................................. 14
   4.9 Disturbance of ACM for Maintenance and/or Renovation Activities ................................ 15
      4.9.1 Small Disturbance (Type 1 or Type 2 Operation) ....................................................... 15
      4.9.2 Large Disturbance .................................................................................................... 16
   4.10 Necessary Equipment/Supplies for OMP ........................................................................ 16
   4.11 ACM Surveillance and Re-inspection .............................................................................. 17
4.12 Updating the Management Program ................................................................. 18

5. General Limitations ............................................................................................. 19

List of Appendices

Appendix A: Terms and Definitions
Appendix B: Ontario Regulation 278/05
Appendix C: Designated Substance Survey
Appendix D: Work Permit Form
Appendix E: Fibre Release Episode Report
Appendix F: Asbestos Management Program Receipt Form
Appendix G: Field Survey Update Form
1. Background Information

1.1 Asbestos

The terms “asbestos” refers to a family of naturally occurring fibrous minerals that are characterized by having long, thin fibres that can easily be separated. Due to these physical properties, asbestos minerals exhibit substantial resistance to heat and chemicals, and thus have been used for a variety of commercial and industrial purposes.

There are primarily three forms of asbestos that have been incorporated into building and mechanical materials. These are chrysotile, amosite, and crocidolite.

*Chrysotile* is white in colour and has a serpentine structure with long flexible fibres. It is the most commonly used form of asbestos comprising 60% to 90% of all asbestos used in asbestos-containing materials. Chrysotile has been mined in Canada since the 1870s.

*Amosite* is brown in colour and has an amphibole structure. Fibre structure resembles rods similar to small wooden dowels. Fibres have a solid-core, are brittle and have spurs jutting out over their surface. Amosite comprises 10% to 40% of the asbestos used in building materials and is commonly used in transite cement pipe because of its tensile strength. Amosite has been mined in South Africa since 1916.

*Crocidolite* is blue in colour and like amosite has an amphibole structure. Crocidolite is relatively rare, comprising only 1% to 2% of the asbestos used in building materials, and has been mined in Africa since the 1890s.

Other common forms of asbestos are *anthophyllite, tremolite and actinolite*, but are rarely found in building applications.

Within the subject property, the forms of asbestos identified were limited to chrysotile asbestos between trace levels to concentrations of 5%.

Terms and definitions pertinent to this asbestos management plan are presented in Appendix A.

1.2 Uses of Asbestos in Building Materials

Asbestos is a naturally occurring fibrous mineral that was previously used in the construction industry. Its high tensile strength, flexibility, ability to withstand high temperatures and its resistance to many corrosive chemicals has made asbestos useful in hundreds of applications. In Ontario, the use of asbestos containing materials began in the 1930s and increased during the post-war construction boom to the point that during the 1950s and 1960s approximately 40 to 50 thousand tonnes were used annually in Ontario. In the early 1970s the use of such materials sharply decreased due to health concerns associated with asbestos. The installation of sprayed asbestos and thermal acoustical insulation is now banned, however, asbestos is still used in the manufacture of asbestos-cement and in materials such as mastics, sealants, and roofing felts. Unfortunately the early widespread use of asbestos has left a potentially dangerous legacy since the thousands of tonnes of asbestos used over the past fifty years can pose a serious risk to workers conducting renovation, repair and demolition work.

There are two classes of asbestos containing materials (ACM) that have been used in the construction industry; friable and non-friable. Friable asbestos material can be crumble by hand pressure and has the potential to release asbestos fibres to the air. Examples of friable materials are sprayed on fireproofing, pipe and boiler insulation and loose fill insulation. Non-friable asbestos materials cannot be crumbled by hand and does not readily release asbestos fibres into the air. Examples of non-friable materials are asbestos cement products and floor tiles.
2. Legislation Governing Asbestos Control

2.1 Introduction

Ontario Regulation 278/05 (O. Reg. 278/05), “Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations”, was developed to address asbestos-containing material in buildings. A copy of this regulation is presented in Appendix B.

O.Reg 278/05 requires that a management program designed to prevent worker exposure to airborne asbestos fibres be established in buildings where asbestos is known to be present. This program includes training of workers who may disturb asbestos and routine inspection and maintenance of the materials. The regulations state that “Ongoing asbestos management in buildings applies to the 1) the owner of a building has been advised under section 9 of the discovery of material that may be asbestos-containing material; and/or, an 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.

Although asbestos is not considered a hazardous waste, Ontario Regulation 347, revised by Reg. 558 made under the Ontario Environmental Protection Act, does define specific requirements for the disposal of materials containing friable asbestos at landfills. These requirements include notification of the landfill site, proper labelling and containment of the material.

2.2 Legislation Requirements for a Management Program for Asbestos in Buildings

Based on asbestos surveys conducted for the subject property, it is noted that asbestos was observed within the following building materials:

- Drywall filler compound – row Houses, apartment buildings and recreational centre;
- Stippled ceiling plaster – row Houses, apartment buildings and recreational centre;
- Stippled wall plaster – apartment building hallways;
- Exterior pebble dash – select row houses;
- Brown window/door caulking at row houses, select apartment units and recreational building; and,
- White window caulking / adhesive in the apartment building.

It is noted that mechanical/electrical equipment was not sampled. Some floor tiles were sampled when considered original within the apartment common spaces. In addition, some suspected original floor tiles were observed in select row house units and are likely original (they may contain asbestos). The analysis of these floor tiles was beyond the scope of this study, but the tiles may contain asbestos and unit owners should be aware of the potential of asbestos within original flooring. Refer to Appendix C for the report entitled

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for a more detailed summary of asbestos-containing materials. In accordance with O.Reg. 278/05, the owner of the building/complex (i.e. condominium board) is required to implement an Asbestos
Management Program since asbestos has been observed. It is our understanding that asbestos was identified during the recent renovation of a unit within the condominium complex thus triggering the survey and associated AMP as the owner knows or now ought to know of the presence of asbestos.

The Asbestos Management Program is required to include the following actions and documents as noted in the following sections:

- Prepare and maintain on the premises a record of the location of the asbestos materials (Asbestos Survey – Appendix C).
- Notify in writing to the tenants or lessees, if any, of the presence and location of asbestos materials. It is to be noted that mechanical / electrical equipment and asbestos may be present in these areas.
- Advise workers who may work in close proximity to the asbestos material and who may disturb the material of its presence.
- Institute and maintain a program for the training and instruction for workers who are likely to work in close proximity to and may disturb the asbestos material in:
  - the hazard of asbestos exposure;
  - the use, care and disposal of protective equipment and clothing to be used and worn, and personal hygiene; and,
  - the worker practices and procedures to be used in doing the work are prescribed by Ontario Regulation 278/05;
- Inspect the asbestos material at reasonable intervals in order to determine its condition; and,
- Implement remedial measures on material that has deteriorated.

If material that is suspected to contain asbestos is discovered, appropriate action to control and or abate the suspect material(s) must be conducted in accordance with O.Reg 278/05.
3. Health Effects

3.1 Health Effects Associated with Asbestos Exposure

Asbestos fibres, because of their relatively small size, tend to settle out very slowly in air, allowing them to remain airborne for several hours and sometimes days. Studies have demonstrated that the inhalation of asbestos fibres may lead to an increased risk of developing one or more respiratory diseases. The three major respiratory diseases associated with asbestos are asbestosis, lung cancer, and mesothelioma (a rare cancer of the outer lining of the lung). It should also be noted that asbestos-related diseases can show up many years later in life, sometimes as much as 25 to 40 years. Exactly why some people develop these diseases and others do not remain unknown.

It is important to recognize that the majority of people who have developed a disease as a result of asbestos exposure were asbestos workers, textile workers, or people who worked in asbestos mines or manufactured products out of asbestos. These workers were frequently exposed to high concentrations of asbestos fibres each working day with little or no protection. The asbestos abatement worker of today follows specific work practices and wears appropriate protection, including respirators, to minimize the risk of exposure.

3.2 The Respiratory System

The primary health effects of asbestos exposure are caused by the inhalation of asbestos fibres. A brief discussion of the respiratory system will help in understanding these effects. As air is breathed into the body, it passes through the mouth and moves into the windpipe or trachea. The trachea splits into two smaller airways called bronchi. Each broncos divides into smaller and smaller tubes which terminate into air sacs called alveoli. In these air sacs, oxygen is absorbed into small blood vessels, and waste gases such as carbon dioxide pass out of the blood.

The lung is divided into two halves and sits in the pleural cavity. This cavity and the outside of the lung have a Saran-wrap type lining. The pleural cavity and lung linings are in contact with each other and are very moist. Just like two panes of glass with a drop of water between them, these linings slide easily across each other, but are very difficult to pull apart. Accordingly, as the chest cavity expands, the lungs expand and air rushes in. If these linings (mesothelia) were to become damaged, inhalation could not occur properly.

The body has several mechanisms by which it “filters” the air it breathes. First, very large particles are removed in the nose and mouth. Many smaller particles impact on the mucous-coated walls of the airways and are caught. These airways have a hair-like lining (ciliated cells) which constantly beats upward. Accordingly, particles caught in the mucous are swept up into the back of the mouth. From here they are swallowed or expelled.

Cigarette smoking temporarily paralyzes the ciliated cells, inhibiting one of the body’s natural defences against unwanted dust. As the smoker sleeps, the hair-like cells start working again and carry large amounts of mucous into the back of the mouth. This causes the so-called “smoker’s hack” in the morning. After the first cigarette or two, the cleaning mechanism is paralyzed again and the coughing stops. It should now be evident why cigarette smokers who are exposed to asbestos appear to be at greater risk. Other reasons will also be discussed later in this section.

Even with the aforementioned natural defences of the body, some dust particles inevitably reach the tiny air sacs. When this occurs, large cells (macrophages) attempt to engulf the particle and “digest” it. For this reason, they are sometimes called the lung's garbage collectors. However, because asbestos is a
mineral fibre, the macrophages are often not successful. In a secondary defence mechanism, these cells deposit a coating on the fibres and scar tissue is formed; a condition then develops known as asbestosis.

3.3 Asbestosis

Asbestosis is a non-malignant, progressive, irreversible lung disease characterized by fibrotic scarring of the lung. It is a restrictive lung disease which reduces the capacity of the lung. The common symptom is shortness of breath. Asbestosis is prevalent among workers who have been exposed to large doses of asbestos fibres over a long period of time. Accordingly, there is a clear dose-response relationship between asbestos exposure and development of this disease. This means that the greater the asbestos exposure, the more likely asbestosis will develop. All forms of asbestos have demonstrated the ability to cause asbestosis. Like all diseases associated with asbestos exposure, it may take many years for the disease to develop. The typical latency period for asbestos is 15 to 30 years. An asbestos abatement worker using work practices and protective equipment described in this manual will have a much smaller likelihood of development asbestosis as a result of his or her work.

3.4 Lung Cancer

Lung cancer is the uncontrolled growth of abnormal cells in the lung or lungs. There are many causes of lung cancer, of which asbestos is only one. While employees exposed to industrial concentrations of asbestos in years past have an increased risk of getting lung cancer (5 times), their risk is not as great as that of cigarette smokers (10 times). These two factors operate together, and a cigarette smoker who also works with asbestos is 50 times more likely to contract lung cancer than the normal population. Like asbestosis, there exists a long lag time between initial exposure and the occurrence of lung cancer, typically 20 to 30 years. There appears to be a dose-response relationship between asbestos exposure and lung cancer, although no “safe level” has yet been determined. Again, these figures relate to past industrial situations where workers wore little or no protective equipment. Proper protection and work practices will substantially lessen the risk of abatement workers getting lung cancer due to asbestos.

3.5 Mesothelioma

The asbestos-associated disease of greatest concern in asbestos abatement is mesothelioma. Fortunately, it is also the rarest. Mesothelioma is a cancer of the mesothelium or chest cavity lining. Although exposure to asbestos has been strongly associated with most cases of mesothelioma, some cases may occur without asbestos exposure. Mesothelioma can also occur in the lining of the abdominal cavity.

If it occurs in the chest cavity, it is called pleural mesothelioma. In the abdominal cavity, it is known as peritoneal mesothelioma. This type of cancer spreads very rapidly and is always fatal. The exact cause remains unknown. There does not appear to be any increased risk of mesothelioma for smokers and there does not appear to be a dose-response relationship between asbestos exposure and mesothelioma. Cases have been recorded where the person’s asbestos exposure has been limited. Like the other diseases of asbestos, mesothelioma takes 30 to 40 years after initial exposure, if it occurs.

3.6 Other Diseases

Several other diseases are found more often among persons exposed to asbestos than the normal population. These include cancer of the esophagus, stomach, colon, and pancreas, pleural plaques, pleural thickening, and pleural effusion. The incidence of these health effects is much less than lung cancer. Again, the importance of using the proper work practices and protective equipment cannot be overemphasized to minimize the occurrence of these diseases due to unnecessary asbestos exposure.
4. Operations and Maintenance Program (OMP)

4.1 Introduction

The principal objective of an Operations and Maintenance Program (OMP) is to minimize exposure of all building occupants to asbestos fibres. To accomplish this objective, an OMP includes work practices to:

1. Maintain asbestos-containing materials in good condition;
2. Ensure proper cleanup of asbestos fibres previously released;
3. Prevent further release of asbestos fibres; and,
4. Monitor the condition of the ACM.

The Operations and Maintenance Program contained in this document shall be used in conjunction with all applicable Federal and Provincial Regulations. Copies of key Regulations are appended to this document for reference (Appendix B). The OMP shall remain in effect until all asbestos-containing building materials (ACM) are removed from the building.

The responsibility for implementation, control and day-to-day performance of the OMP lies with the AMP Administrator who shall be fully trained, thoroughly knowledgeable of all asbestos regulations, and ensure that the regulations are strictly adhered to. All maintenance and custodial employees who are required to work in close proximity to ACM shall also be fully trained.

4.1.1 Work Control/Permit System

The Operations and Maintenance Program (OMP) includes a system to control all work that could disturb ACM. This includes a "work permit" program, which requires the person requesting the work to submit a Work Permit (Appendix D) to the AMP Administrator before any maintenance work is begun. The "Work Permit" form gives the time and location of the requested work, the type of maintenance needed, and available information about any ACM in the vicinity of the requested work which is to be completed by the AMP administrator. The contractor or other person authorized to perform the work will be identified on the work request.

Upon receiving a pre-work Work Permit, the AMP Administrator should take the following steps:

1. Refer to written records, building plans and specifications, and any building ACM inspection reports to determine whether ACM is present in the area where work will occur. In the case of the mechanical/electrical equipment, they were not assessed in detail and should be assessed prior to entering. If ACM is present, but it is not anticipated that the material will be disturbed, the AMP Administrator should note the presence of the ACM on the permit form and provide additional instruction on the importance of not disturbing the ACM.

2. If ACM is both present and likely to be disturbed, the AMP Administrator or a designated supervisor qualified by training or experience should visit the site and determine the work practices that should be instituted to minimize the release of asbestos fibres during the maintenance activity and/or determine if the work should be completed by outside contractors.

3. This determination should be recorded on the Work Permit, which is then sent to the in-house maintenance supervisor or to the maintenance contractor to authorize the work.
4. The AMP Administrator should make sure that a copy of both the request and the authorization forms (if granted) are placed in the permanent file.

5. Where the task is not covered by previously approved standard work practices, the AMP Administrator should make sure that the appropriate work practices and protective measures are used for the job.

6. For all jobs where contact with ACM is likely or areas where access was limited during the asbestos survey due to electrical hazards, the AMP Administrator or a designated supervisor qualified by training or experience should visit the work site when the work begins to see that the job is being performed properly. For lengthy jobs where disturbance of ACM is intended or likely, periodic inspections should be made for the duration of the project.

Some examples of procedures for asbestos work are as follows (the complete list included in O.Reg. 278/05 within Appendix B).

**Type 1 operations** are considered to be projects related to the removal or abatement of non-friable asbestos products, where the potential for generation of airborne fibres are minimal.

The following are some examples, but not limited to, of Type 1 operations (i.e. **drywall compound in small quantities, adhesive caulking**):

- Installing or removing non-friable asbestos-containing material if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated (floor tiles, fire stop material, sealant);
- Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material (i.e. floor tiles, fire stop material, sealant, ductwork with sealant) if:
  - The material is wetted to control the spread of dust or fibres, and,
  - The work is done only by means of non-powered hand-held tools.
- Removing less than one square metre of drywall in which joint-filling compounds that are asbestos-containing material have been used

**Type 2 operations** are considered to be “minor” projects involving disturbance of wet friable ACM (pipe wrap, elbows, and mud hangers) and small quantities of plaster. The following are some examples, but not limited to, of Type 2 operations (**drywall compound removal, stippled plaster in small quantities, pebble dash in small quantities**):

- The removal of one square metre or more of drywall in which joint filling compounds that are asbestos-containing material have been used.
- The removal or disturbance of one square metre or less of asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of the building:
- Breaking, cutting, drilling, abrading, grinding, sanding or vibrating asbestos-containing material if:
  - The material is not wetted to control the spread of dust or fibres, and,
  - The work is done only by means of non-powered hand-held tools.
- 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;
An operation that:
- may expose a worker to asbestos, and,
- is not classified as a Type 1 or Type 3 operation.

**Type 3 operations** are considered to be “major” projects involving disturbance of wet friable ACM. Full work enclosures and specific enclosure maintenance and installations must be implemented as part of Type 3 operations. The interior of the work enclosure must be maintained under negative air and the installation of airlocks and shower facilities to service the work enclosure must be implemented as part of Type 3 operations. The following are some examples, but not limited to, of Type 3 operations (i.e. stippled plaster, pebble dash (exterior)).

- 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 the building.
- 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.

For the most part, any Type 2 and Type 3 operation will be conducted by outside contractors specializing in asbestos abatement. The OMP for this facility will include the following elements:

1. **Training:** Training for AMP Administrator and identified facilities maintenance staff.
2. **Notification:** A program to inform building staff and hired contractors where ACM is located, and how and why to avoid disturbing the ACM. All persons whose work may affect and disturb ACM or workers working in the vicinity of ACM will be properly informed of the dangers of the exposure to asbestos materials.
3. **Worker Protection:** Medical and respiratory protection programs, as applicable.
4. **Surveillance:** Regular ACM surveillance to note, assess, and document any changes in the ACM’s condition.
5. **Record-Keeping:** To document Operation and Maintenance Program (OMP) activities.
6. **Work Practices:** Operations and Maintenance Program (OMP) work practices to avoid or minimize fibre release during activities affecting ACM.
7. **Controls:** Work control/permit system to control activities which might disturb ACM.
8. **Asbestos Emergency Incident Procedures:** To respond to accidental damage of ACM.

4.1.2 Use of Outside Contractors for Asbestos Abatement

At a minimum, contracts with service trades or abatement companies should include the following provisions to ensure that the service or abatement workers can and will follow appropriate work practices:

1. Proof that the contractor’s workers have been properly notified about ACM in the owner’s building and that they are properly trained and accredited (if necessary) to work with ACM.
2. Copies of respiratory protection, medical surveillance, and worker training documentation as required by O. Reg. 278/05.
3. Notification to building staff, occupants and visitors that abatement activity is underway will be performed by outside contractors.
4. Written work practices must be submitted by the vendor or contractor for approval or modification by the AMP Administrator. The vendor or contractor should then agree to abide by the work practices as finally accepted by the AMP Administrator.

5. Assurance that the contractor will use proper work area isolation techniques, proper equipment, and sound waste practices.

6. Provisions for inspections of the area by the owner’s representative to ensure that the area is acceptable for re-entry of occupants/tenants.

7. A resume for each abatement contractor/supervisor or maintenance crew chief, known as the “competent person”.

8. Criteria to be used for determining successful completion of the work (i.e., visual inspections and air monitoring).

9. Any of the information deemed necessary by the owner’s legal counsel.

10. Notification by the contractor to Ministry of Labour (and appropriate agencies) if the abatement project is a Type 3 Operation.

4.2 Asbestos Records

Documentation which identifies all accessible ACM by type, percentage, condition, location, accessibility and approximate extent can be found as part of the asbestos survey within Appendix C of the report.

Record keeping and constant updates to the records are essential to a good Asbestos OMP. All the building asbestos management documents discussed in this Manual should be stored in permanent files located in an appropriate management department.

It is recommended that the client make available all written elements of the OMP program to building staff as well as to other building occupants, if applicable.

Should future renovation and/or demolition activities reveal and/or involve the disturbance of any asbestos suspect materials which at the time of the site visit may have been inaccessible (main hall of recreational room, unit not entered) or concealed (behind wall or ceiling) and/or not sampled/tested (not common building material), sampling and testing of any such suspect materials should be undertaken. The removal and handling of the asbestos containing materials must be performed in accordance with O. Reg. 278/05 and as noted in the OMP.

4.3 Worker/Occupant Notification

It is required by law that all employees/occupants who have a potential to come into contact with the material be fully informed of the ACM for everyone’s protection. These employees/occupants identified by the AMP Administrator and shall review this document (i.e. Asbestos Management Plan). Each employee/occupant should sign a receipt (Appendix F) to prove that he or she has had the opportunity to review this document. New employees/occupants fitting this category shall receive a copy of this manual for review soon after they are hired.

A yearly update of the manual will be made so that it is current with Ministry of Labour Regulations and changes made to the buildings.
4.4 Asbestos Awareness Training

The Regulation requires that all employees (maintenance staff) who work in close proximity to and may disturb friable ACM be given awareness training, if materials are identified in areas that limited access was provided at the time of the site inspection.

All persons receiving awareness training should have a clear understanding of the following points with respect to specific building conditions associated with the facility:

- Awareness to assess the condition of the ACM, and to initiate the proper response which is appropriate for that condition;
- Asbestos only presents a health hazard when fibres become airborne and are inhaled. The mere presence of ACM does not represent a health hazard;
- General knowledge and understanding of the asbestos survey for the building, to the extent that there is an awareness of the location and types of building materials which contain or potentially contain ACM;
- Awareness not to disturb the ACM or suspected ACM (e.g., do not push furniture against the ACM);
- The requirement to report any evidence of disturbance or damage of ACM to the AMP Administrator;
- The requirement to report any dust or debris that might come from the ACM or suspect ACM, any change in the condition of the ACM, or any improper action of building personnel (relative to ACM) to the AMP Administrator;
- The understanding that all cleaning and maintenance personnel are taking special precautions during their work to properly clean up any asbestos debris and to guard against disturbing ACM; and,
- The understanding that all ACM is inspected periodically and additional measures will be taken if needed to protect the health of building occupants.

IT SHALL BE NOTED THAT THE AWARENESS TRAINING PROGRAM DOES NOT TRAIN WORKERS TO HANDLE OR REMOVE ACM.

Appendix B contains a copy of the following regulation for use by the employees:


4.5 Asbestos Worker/Handler Training (Two Days)

4.5.1 Introduction

The intent of this training is to enable some maintenance staff to perform "Minor Removals or Repairs” as defined by the MOL. This will enable maintenance personnel to respond to in-house incidences or maintenance which caused damage to ACM. As well, minor asbestos removals can be done to facilitate equipment repair, to accommodate renovations and upgrades, or to remove asbestos which has the potential for damage.
4.5.2 Worker Protection

**Respiratory Protection**

The selection of approved respirators, suitable for the hazards to which the worker is exposed, is only one aspect of a complete respiratory protection program. Other elements include written operating procedures for respirator use; outlining personnel responsibilities for respirator cleaning, storage and repair; medical examination of workers for respirator use; training in proper respirator use and limitations; respirator fit testing; respirator cleaning and care; and work-site supervision. The OMP respirator program can be administered by the AMP Administrator, if properly qualified.

Proper respiratory protection is an integral part of all custodial and maintenance activities involving potential exposure to asbestos. When in doubt about exposure during a certain work operation, the owner should provide respiratory protection to custodial and maintenance workers. Ministry of Labour (MOL) specifies general types of respirators for protection against airborne asbestos during "construction" activities, which include abatement, renovation, maintenance, repair, and remodelling.

Personal air sampling is not the same as area air monitoring. Personal air sampling is designed to measure an individual worker's exposure to fibres while the worker is conducting tasks that may disturb ACM. The sampling device is worn by the worker and positioned so that it samples air in the worker's breathing zone. In contrast, area (or ambient) air sampling is conducted to get an estimate of the numbers of airborne asbestos fibres present in a building. It is used as an assessment tool in evaluating the potential hazard posed by asbestos to all building occupants.

When adequate care is taken to prevent or minimize and control fibre release, routine, small-scale/short-duration maintenance or custodial tasks are not likely to generate high levels of airborne asbestos compared to large asbestos removal projects; and respirators which filter breathing air may be used. MOL, EPA, and NIOSH are on record as not recommending single use, disposable paper dust masks for use against asbestos; in fact MOL has disallowed their use against airborne asbestos fibres as they do not provide sufficient protection from airborne asbestos fibres.

The options that may be used include:

- A half-face or full face piece, negative pressure, air-purifying respirator with replaceable high-efficiency filters.

- A half or full face piece powered air-purifying respirator (PAPR) with replaceable high-efficiency filters. This has a battery-powered pump which assists breathing and provides positive pressure in the face piece.

The selection of the appropriate respirator is based on the type of work to be carried out, and the expected level and type of airborne asbestos fibres that will be generated.

Under the MOL standards for asbestos, any employee required to wear a negative pressure respirator can request a powered air-purifying respirator, and the employer is required to provide a fully functional and approved unit, provided it will afford the worker as least equal protection.

Currently, only respirators approved by NIOSH and the Mine Safety and Health Administration (MSHA) are permitted for use. If they are air-purifying respirators, the filtration device(s) must be rated as "high-efficiency."

For additional information on respirator programs, respirator types, and respirator use, the building owner or AMP Administrator may want to use the following references:
• Ontario Regulation 278/05, Ministry of Labour;
• "Respiratory Protection: An Employer’s Manual," NIOSH, October 1978;
• OSHA Respirator Standard (29 CFR 1910.134);
• OSHA Asbestos Regulations (29 CFR 1910.1001 and 1926.58);
• “Respirator Decision Logic,” NIOSH, May 1987; and,

**Protective Clothing**

In addition to the use of respirators, some OMP procedures may require workers to wear protective clothing. Most often, protective clothing is disposable and consists of coveralls, a head cover, and foot covers made of a synthetic fabric which does not allow asbestos fibres to pass through. This type of clothing prevents workers’ regular clothing from becoming contaminated with asbestos fibres.

O. Reg. 278/05 requires workers to wear protective clothing whenever they are exposed, or are likely to be exposed, to fibre levels above permissible levels. It is important that workers be properly trained in the use, removal and disposal of protective clothing after use. All OMP activities may not require the use of protective clothing. It is important for the AMP Administrator to assess this need on a case-by-case basis.

### 4.6 AMP Administrator Training (Two to Three Days)

The AMP Administrator or his delegate will take a comprehensive training course which contains all the training modules required under the Ontario Ministry of Labour training guidelines. These modules include the following topics:

• History and Uses of Asbestos;
• Health Effects and Medical Surveillance;
• Overview of Ontario Asbestos Regulations;
• Liability;
• Limitations of Training;
• Principles of Remedial Measures;
• Uses and Interpretations of Asbestos Records;
• Classification of Work:
  • Type 1 Procedures;
  • Type 2 Procedures; and,
  • Type 3 Procedures;
• Respirator Training;
• Use, Care and Disposal of Protective Clothing;
• Inspecting Buildings for Asbestos; and,
• Assessing the Potential for Asbestos Exposure.

4.7 Cleaning Areas and Procedures

All occupied areas where ACM has been disturbed, including areas that may get scheduled for ACM removal, shall have the ACM stabilized or removed and are to be properly cleaned at the inception of this program under the direction of the AMP Administrator. Subsequent cleaning shall be done upon completion of any future maintenance, renovation, or emergency activity that disturbs ACM.

Proper OMP cleaning will involve the use of wet cleaning or wet-wiping practices to pick up asbestos fibres. Dry sweeping or dusting can result in asbestos fibres being re-suspended into the building's air and therefore should not be used. Once wet cloths, rags, or mops have been used to pick up asbestos fibres, they should be properly discarded as asbestos waste while still wet. They should not be allowed to dry out, since the collected fibres might be released at some later time when disturbed. The use of special vacuum cleaners, commonly referred to as HEPA vacuums, may be preferable to wet cleaning in certain situations. These vacuums are equipped with filters designed to remove very small particles or fibres—such as asbestos—by filtering those particles from the air passing through the vacuum. Since the exhaust air from an ordinary vacuum cleaner is not filtered sufficiently, it is possible for tiny asbestos fibres to pass through the filter and back into the building air.

It is important for OMP workers to use caution when emptying HEPA vacuums and changing filters. Exposure could result from such activities. Workers should move the HEPA vacuum to a physically isolated area of the facility and put on proper personal protective equipment before emptying the dust and debris into properly labelled, sealed, and leak-tight containers for disposal as asbestos-containing waste.

If ACM has been released onto a carpeted area of a building, it may not always be possible to adequately clean the carpeted area. “Steam” cleaning and HEPA vacuuming methods are sometimes employed for this purpose.

For carpets, successful cleaning will likely depend on factors such as the amount of ACM released onto the carpet, how long the situation has existed, traffic over the area, as well as the structure and composition of the carpet itself. It is prudent to evaluate individual situations on a case-by-case basis. The AMP Administrator should consider the need for workers engaged in cleaning asbestos fibre-contaminated carpets to wear proper respiratory protection. It may also be prudent to arrange for this type of cleaning to be done after normal working hours or when the facility is less occupied. Additionally, it may be more cost effective to properly dispose of contaminated carpets and other fabrics as asbestos-containing waste if a permanent asbestos control option is being undertaken in the building.

All work shall be done by in-house maintenance staff that have received Asbestos Worker/Handler Training and shall take place after hours or during periods of low activity (i.e., nights or weekends) if possible.

4.8 Emergency Response Procedures

An “emergency” is any disturbance of ACM which causes the release of asbestos fibres. Any disturbance of friable ACM must be addressed immediately.

Any employee who determines that there has been a release of asbestos fibres shall immediately notify the AMP Administrator and relay the location and the extent of the damage. The AMP Administrator will then institute the appropriate response action and document the incident on a Fibre Release Episode Report (Appendix E).
Fibre releases can be termed “minor” or “major”. The determination of the type of release depends on the size or area of the affected material. The following guidelines will apply to friable materials:

**Minor Release:** Less than 9 sq. ft. of friable ACM (or 21 linear ft. of 1.6 in. pipe or equivalent, if pipe would be identified). Any quantity of drywall compound bound to drywall.

**Major Release:** Greater than 9 sq. ft. of friable ACM (or 21 linear ft. of 1.6 in. pipe or equivalent, if pipe would be identified) with the exception of drywall compound bound to drywall.

The following sections describe actions to be taken once the type of release has been determined. The AMP Administrator shall determine the type of release. All asbestos abatement work is to be done by an outside contractor specialized in this field.

### 4.8.1 Minor Release Episode

Any minor release episode will be abated following Type 2 procedures and the following shall apply:

- The area shall be immediately isolated as determined by the AMP Administrator. This may include physical barriers such as doors or plastic sheeting and a shutdown of the HVAC systems.
- Personal protective equipment shall be worn when working in the area of the release;
- All debris shall be immediately saturated with amended water utilizing low pressure sprayers;
- All ACM shall be placed inside double 6 mil polyethylene bags and properly sealed. All bags shall be properly labelled with asbestos warning signs;
- All damaged ACM shall be carefully repaired and encapsulated or enclosed or removed;
- Upon completion of repairs and bulk cleanup, the entire area and exterior of the disposal bags shall be cleaned by the use of a HEPA vacuum. The exterior of the protective suits and footwear shall also be HEPA vacuumed; and,
- The entire area shall be wet wiped with amended water. The protective footwear shall be wet wiped. All wiping materials shall be disposed of as ACM in properly labelled double 6 mil polyethylene bags.

All action taken shall be fully documented on a Fibre Release Episode Report form and submitted to the AMP Administrator.

### 4.8.2 Major Release Episode

Any major release episode shall require the immediate isolation of all affected areas and the involvement of a consultant and a removal contractor. A major release episode is considered more severe as it can result in the contamination of large areas of the building. The consultant will design the appropriate response action and will work closely with the AMP Administrator. Guidelines identical to those listed above shall be followed, however, depending on the circumstances, it may be elevated to Type 3 status at the discretion of the AMP Administrator.
4.9 Disturbance of ACM for Maintenance and/or Renovation Activities

All activities conducted in areas containing ACM shall be documented on a Work Permit (Appendix D) and approved by the AMP Administrator. All outside contractors providing services to Carleton Condominium Corporation No. 6 shall be informed of the ACM (or areas not thoroughly reviewed due to limited accesses as a result of electrical hazards) by reviewing a copy of this manual. Only asbestos abatement contractors specialized in this field will be allowed to disturb asbestos. All activities closely monitored by the AMP Administrator and documented for permanent record in the Management Plan.

Scheduled disturbance of ACM shall fall into one of two categories:

**Small Disturbance:** Less than 9 sq. ft. of friable ACM (or 21 linear ft. of 1.6 in. pipe or equivalent) or any quantity of non-friable materials using manual equipment. Any quantity of drywall compound bound to drywall.

**Large Disturbance:** Greater than 9 sq. ft. of friable ACM (or 21 linear ft. of 1.6 in. pipe or equivalent) and not drywall compound bound to drywall.

The AMP Administrator shall determine the type of disturbance. The following sections describe actions to be taken by trained maintenance staff or an outside contractor hired to abate the asbestos. All work shall be completed in accordance with protocols established in O.Reg. 278/05.

4.9.1 Small Disturbance (Type 1 or Type 2 Operation)

- The area shall be sealed off using plastic and/or locked doors and appropriate warning signs posted. All emergency exits within the area must be kept accessible.
- The air handling system(s) must be isolated to prevent the distribution of asbestos fibres throughout the building.
- Workers shall wear a minimum of a negative pressure respirator and personal protective equipment.
- A 6-mil polyethylene drop cloth shall be placed beneath the location of work, extending at least 10 ft. beyond all sides of the area. An enclosure should be erected and covered with 6-mil plastic to wholly contain the work area. This will further inhibit the spread of asbestos fibres.
- If the space above the suspended ceiling must be entered, care shall be taken in removing the ceiling tile. The area above the ceiling and the ceiling tile itself should be thoroughly misted with amended water at the start and throughout the work.
- During the course of the work, all asbestos containing surfacing material shall be collected directly into double 6 mil polyethylene disposal bags or collected by placing the HEPA vacuum hose just beneath the material being removed.
- If possible, all pipe insulation shall be removed using glove bag techniques.
- Upon completion of removal of the ACM, the substrate shall be wet wiped using amended water to ensure all of the contaminated material is removed. All wiping materials shall be considered to be ACM.
- An encapsulant shall be applied to the substrate to lock down any fibres that may remain.
- Work areas above ceilings shall be HEPA vacuumed and wet wiped with amended water prior to replacing the ceiling tile and vacating the area.
• All tools and equipment shall be cleaned with a HEPA vacuum and wet wiped with amended water.

• Personal decontamination shall be completed before exiting the work area. Employees shall clean their disposable suites and all personal protective equipment using the HEPA vacuum and wet wiping with amended water. All materials, including disposable clothing, respirator cartridges, and wiping cloths must be placed in double 6 mil disposable polyethylene bags prior to vacating the area. The bags shall be properly labelled with asbestos hazard warning signs.

• All activities shall be fully documented on the Work Permit.

The Work Permit must be given to the AMP Administrator for filing with the Management Plan.

4.9.2 Large Disturbance

Any maintenance or renovation activity requiring a large disturbance of ACM shall be performed only after consultation with a consultant or the Ministry of Labour.

In the event of accidental large disturbance of ACM during a routine maintenance or renovation activity, the workers shall:

• Notify the AMP Administrator; and,

• Document the episode on a Fibre Release Episode Report.

The AMP Administrator shall:

• Contact a consultant (if necessary) and/or a removal contractor;

• Initiate isolation of the contaminated area and evacuation as deemed necessary;

• Install asbestos hazard warning signs;

• Work with the consultant and/or removal contractor on remedial measures of the contaminated area;

• Oversee abatement activity to ensure all regulations are strictly adhered to by the contractor;

• Document any problems or mishaps during the project; and,

• File all information with the Management Plan for permanent record.

4.10 Necessary Equipment/Supplies for OMP

Materials and equipment itemized in this section are considered essential for any OMP where maintenance staffs are trained to handle ACM. The AMP Administrator shall have a clean, secure area where these items can be safely stored and be readily available. Personal equipment shall have names attached so that only one person uses the equipment. Required equipment is as follows:

• Danger Asbestos Signs - Work Area;

• Danger Asbestos Signs - For attaching to ACM or Asbestos Free signs for attaching to non-ACM;

• Caution Tape - for roping off work area;

• Plaster Cast Cloth - For minor repairs;

• Respirators (individual, fit tested);
- Coveralls (disposable, impervious to asbestos fibres);
- Glove Bag(s) (if completed by maintenance staff - MOL approved);
- Garden Pump Sprayer;
- Agent for amended water;
- 3" wide duct tape;
- Flexisaw;
- Utility knife with retractable blade;
- Wire cutters;
- Roll of 6 mil polyethylene;
- Nylon bristle scrub brush;
- Rags;
- Encapsulating putty;
- Liquid encapsulating product;
- 6 mil polyethylene labelled disposable bags;
- HEPA vacuum; and,
- Re-insulation materials, if necessary.

4.11 ACM Surveillance and Re-inspection

Exp recommends that CCC #6 should commence performing, or have performed, an annual update to the AMP, including an inspection of ACM in the building by a qualified person.

It is understood that each condominium unit cannot be accessed during such inspections (a minimum of one unit per row house block and apartment building is inspected). As a result, maintaining records would be beneficial in updating the asbestos records. Prior to each annual re-inspection, it is recommended that a memo be submitted to individual unit owners. This memo should request information of large scale renovations, potential water damage that may have impacted drywall and associated drywall compound, as well as asbestos removal completed within units. Any units that have indicated a “yes” to any of these questions can be reviewed as part of the re-inspection and incorporated into updated asbestos reports. Field Survey Update forms are presented in Appendix G.

It is noted that no renovations impacting asbestos containing materials should be conducted without following the guidelines outlined in Section 4.9 “Disturbance of ACM for Maintenance and/or Renovation Activities”. All asbestos abatement activities should be carried out by an abatement contractor unless small disturbance and conducted by someone with appropriate training.
4.12 Updating the Management Program

Upon the completion of any remedial work (if ACM is identified), the AMP Administrator shall enter updated information on the Field Survey Update form and file it as an addendum to the original Asbestos Site Survey.
5. General Limitations

The services performed and outlined herein were based in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site that were unavailable for direct observation by objects or coverings at the time of our observations.

Any of our observations relating to designated substances at the site are described in this report. Where testing was performed, it was executed in accordance with our contract for these services. Other compounds or materials not tested for might be present in the buildings.

The objective of this report was to survey the environmental conditions at the site within the context of our contract with respect to the existing regulations within the applicable jurisdiction. Compliance of past and current owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.

The conclusions of this report are based, in part, on the information provided by others and any testing and analyses described in the report. The possibility remains that unexpected environmental conditions may be encountered at the site locations not explored. Should such an event occur, exp should be notified in order that we may determine if modifications to our conclusions are necessary.

This report has been prepared in accordance with generally accepted environmental study and/or engineering practices. No other warranties, expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.

This report was prepared by exp for the exclusive use of Carleton Condominium Corporation No. 6, and may not be reproduced in whole or in part, without the prior written consent of exp, or used or relied upon in whole or in part by a party other than Carleton Condominium Corporation No. 6. Any use which a third party makes of this report, or any part thereof, or any reliance on or decisions to be made based on it, are the sole responsibility of such third parties. Exp accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust this report is satisfactory for your purposes. If you have any questions regarding our submission, please do not hesitate to contact this office.
Appendix A:
Terms and Definitions
Terms and Definitions

Acoustical Insulation  The general application or use of asbestos for the control of sound due to its lack of reverberant surfaces.

Acoustical Tile  A finishing material in a building usually found in the ceiling or walls for the purpose of noise control.

Aggressive Sampling  Air sampling which takes place after final cleanup while the air is being physically agitated to produce a “worst case” situation.

Air Monitoring  The process of measuring the airborne fibre concentration of a specific quantity of air over a given amount of time.

Airborne Asbestos Analysis  Determination of the amount of asbestos fibres suspended in a given amount of air.

Alveolar Macrophages  Highly specialized mobile cells in the lungs that attempt to engulf and digest such lung hazards as dusts or fibres.

Alveoli  Located in clusters around the respiratory bronchioles of the lungs, this is the area in which true respiration takes place.

Ambient Air  The surrounding air or atmosphere in a given area under normal conditions.

Amended Water  Water to which a chemical wetting agent (surfactant) has been added to improve penetration into asbestos-containing materials that are being removed.

Approved Landfill  A site for the disposal of asbestos-containing and other hazardous wastes that has been given MOE approval.

Asbestiform  Fibrous minerals which, due to their crystal structure and chemical composition, can be classified as a form of asbestos.

Asbestos  A generic name given to a number of naturally occurring hydrated mineral silicates that possess a unique crystalline structure, are incombustible in air, and are separable into fibres. Asbestos includes asbestiform varieties of chrysotile (serpentine), crocidolite (riebeckite), amosite (cummingtonite-grunerite), tremolite, anthophyllite and actinolite.

Asbestos Abatement  Procedures to control fibre release from asbestos-containing materials in buildings.

Asbestos Containing Materials (AMP)  Material that contains 0.5 percent or more asbestos by dry weight.

Asbestos Fibres  Fibres with their length being greater than five microns (length to width ratio of 3:1), generated from an asbestos-containing material.
Asbestosis  A non-malignant, progressive, irreversible lung disease caused by the inhalation of asbestos dust and characterized by diffuse fibrosis.

Bridging Encapsulant  The application of a sealant over the surface of asbestos-containing material to prevent the release of asbestos fibres.

Bronchi  Primary branches of the trachea (windpipe).

Cancer  A cellular tumor which normally leads to premature death of its host unless controlled.

Carbon Monoxide  A highly toxic colourless and odorless gas.

Cementitious  Asbestos-containing materials that are densely packed, granular, and friable.

cfm  Cubic feet per minute.

Chrysotile (white asbestos)  The only asbestiform mineral of the serpentine variety which contains approximately 40% each of silica and magnesium oxide. It is the most common form of asbestos used in buildings.

Cilia  Tiny hair-like structures in the windpipe and bronchi of the lung passages that help force undesirable particles and liquids up and out of the lungs.

Clean Area  The first stage of the decontamination enclosure system in which workers prepare to enter the work area.

Closed Circuit SCBA  A self-contained respiratory protection device in which the air is re-breathed after the exhaled carbon dioxide has been removed and the oxygen content restored.

Compressed Oxygen Cylinder Type Closed Circuit SCBA  A self-contained respiratory protection device in which air is supplied from a compressed air cylinder. The exhaled air is filtered to remove carbon dioxide, and additional breathing air is provided.

Containment  The isolation of the work area from the rest of the building to prevent the escape of asbestos fibres into other areas.

Contaminated Items  Any objects that have been exposed to airborne asbestos fibres without being sealed off or isolated.

Continuous Flow Airline Device  A respirator that maintains a constant airflow to the wearer.

Decontamination Enclosure System  A series of connected rooms with polyethylene curtained doorways for the purpose of preventing contamination of areas adjacent to the work area.

Delaminate  To delaminate is to separate into layers. As used in asbestos-containing material from the substrate or underlayer.
Dirty Area  Any area in which the concentration of airborne asbestos fibres exceeds 0.01 f/cc, or where there is visible asbestos residue.

Duct Tape  Heavy gauge tape capable of sealing joints or adjacent sheets of polyethylene.

Electron Microscopy  A method of asbestos sample analysis which utilizes an electron beam to differentiate between fibres.

Encapsulant  A substance applied to asbestos-containing material which controls the release of airborne asbestos fibres.

Encapsulation  The coating of asbestos-containing material with a bonding or sealing agent to prevent the release of airborne fibres.

Enclosure  Enclosure is the construction of an air-tight barrier over or around friable asbestos to contain fibres and prevent building contamination due to accidental damage to the asbestos material. Enclosure is an alternate abatement process.

EPA  Environmental Protection Agency (United States)

Equipment Room  The last stage or room of the worker decontamination system before entering the work area.

Eyepiece  A component of a full facepiece respirator which is a gas-tight transparent window through which the wearer may see.

f/cc  Fibres per cubic centimeters of air.

Facepiece  The portion of a respirator which covers the wearer’s nose, mouth, and eyes in a full facepiece.

FEV₁  The maximum volume of air that can be forced from an individual’s fully inflated lungs in one second (Forced Expiratory Volume - one second).

Fibre Containment  Enclosing or sealing off an area having airborne asbestos fibres present so that the fibres will not migrate resulting in contamination of other areas.

Fibre Control  Minimizing the amount of airborne fibre generation through the application or amended water onto asbestos-containing material, or enclosure (isolation) of the material.

Fibrosis  A condition of the lungs caused by the inhalation of excessive amounts of fibrous dust marked by the presence of scale tissue.

Fibrous  Composed almost entirely of fibres.

Fibrous Aerosol Monitor (FAM)  A portable survey instrument with the capability of providing instantaneous airborne fibre concentration readings.
Fireproofing
Spray- or trowel-applied fire resistant materials.

Forced Vital Capacity (FVC)
The measured quantity of air that be forcibly exhaled from a person’s lungs after full inhalation.

Friable Material
Any materials that when dry can be crumbled, pulverized or powdered by hand pressure, or is crumbled, pulverized or powdered.

Full Facepiece Respirator
A respirator which covers the wearer’s entire face from the hairline to below the chin.

Glovebag
Plastic bag-type enclosure placed around asbestos-containing pipe lagging so that it may be removed without generating airborne fibres into the atmosphere.

Grade D Air
Breathing air which has between 19.5% and 23% oxygen, no more than 5 mg/m³ of condensed hydrocarbons, no more than 20 ppm of carbon monoxide, no pronounced odor, and a maximum of 1000 ppm carbon dioxide.

Ground Fault Circuit Breaker
A circuit breaker that is sensitive to very low levels of current leakage from a fault in an electrical system.

Ground Fault Circuit Interrupter
A device which automatically de-energizes any high voltage system component which has developed a fault in the ground line.

HEPA
High Efficiency Particulate Air (Filter)

HEPA Filtered Vacuum
A high efficiency particulate air (HEPA) filtered vacuum capable of trapping and retaining 99.97% of all particles larger than 0.3 microns.

High Mast / High Efficiency
A respirator which covers one-half of the wearer’s face and is equipped with filters capable of screening out 99.97% of all particles larger than 0.3 microns.

Homogeneous
Evenly mixed and similar in appearance and texture throughout.

Hose Masks
Respirators that supply air from an uncontaminated source through a strong, large diameter hose to the facepiece that does not use compressed air or have any pressure-regulating devices.

HVAC System
Heating, Ventilation, and Air Conditioning system usually found in large business and industry facilities.

Industrial Hygienist
A professional qualified by education, training and experience to recognize, evaluate, and develop controls for occupational health hazards.

Local Exhaust Ventilation
The mechanical removal of air containments from a point of operation.

Logbook
An official record of all activities which occurred during a removal project.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung Cancer</td>
<td>An uncontrolled growth of abnormal cells in the lungs which normally results in the death of the host.</td>
</tr>
<tr>
<td>Make-up Air</td>
<td>Supplied or recirculated air to offset that which has already been exhausted from an area.</td>
</tr>
<tr>
<td>Medical History</td>
<td>A record of a person's past health record, including all the hazardous materials that they have been exposed to, and any injuries or illnesses which might dictate their future health status.</td>
</tr>
<tr>
<td>Mesothelioma</td>
<td>A relatively rare form of cancer which develops in the lining of the pleura or peritoneum with no known cure.</td>
</tr>
<tr>
<td>Method 7400</td>
<td>NIOSH sampling and analytical method for fibres using phase-contrast microscopy. Replaces method P&amp;CAM 239.</td>
</tr>
<tr>
<td>Micron</td>
<td>One millionth of a meter</td>
</tr>
<tr>
<td>Mil</td>
<td>One-thousandth</td>
</tr>
<tr>
<td>Millimeter</td>
<td>One-thousandth of a meter</td>
</tr>
<tr>
<td>MOL</td>
<td>Ontario Ministry of Labour</td>
</tr>
<tr>
<td>Mineral Wool</td>
<td>A commonly used substitute for asbestos</td>
</tr>
<tr>
<td>MSDS</td>
<td>Material Safety Data Sheet</td>
</tr>
<tr>
<td>MSHA</td>
<td>Mine Safety and Health Administration</td>
</tr>
<tr>
<td>Negative Pressure</td>
<td>An atmosphere created in a work area enclosure such that airborne fibres will tend to be drawn through the filtration system rather than leak out into the surrounding areas. The air pressure inside the work area is less than that outside the work area.</td>
</tr>
<tr>
<td>NIOSH</td>
<td>The National Institute for Occupational Safety and Health which was established by the Occupational Safety and Health Act of 1970 (United States).</td>
</tr>
<tr>
<td>NIOSH/MSHA</td>
<td>The official approving agencies for respiratory protective equipment who test and certify respirators.</td>
</tr>
<tr>
<td>Oil-less Compressor</td>
<td>An air compressor that is not oil lubricated and therefore does not allow oil vapour or droplets to be formed in the breathing air.</td>
</tr>
<tr>
<td>Open Circuit SCBA</td>
<td>A type of self-contained breathing unit which exhausts the exhaled air to the atmosphere instead of recirculating it.</td>
</tr>
<tr>
<td>Operations &amp; Maintenance Program (OMP)</td>
<td>Specific procedures and practices developed for the interim control of asbestos-containing materials in buildings until it is removed.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
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<td>-------------------------------</td>
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</tr>
<tr>
<td>OSHA</td>
<td>The Occupational Safety and Health Administration which was created by the Occupational Safety and Health Act of 1970; serves as the enforcement agency for safety and health in the workplace environment (United States).</td>
</tr>
<tr>
<td>Oxygen-deficient Atmosphere</td>
<td>Any atmosphere containing less than 19.5% oxygen.</td>
</tr>
<tr>
<td>P&amp;CAM 239</td>
<td>A NIOSH sampling and analytical method for measuring airborne fibres using phase-contract microscopy.</td>
</tr>
<tr>
<td>Particulate Contaminants</td>
<td>Minute airborne particles given off in the form of dusts, smokes, fumes, or mists.</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit as stated by OSHA.</td>
</tr>
<tr>
<td>Penetrating Encapsulant</td>
<td>Liquid material applied to asbestos-containing material to control airborne fibre release by penetrating into the material and binding its components together.</td>
</tr>
<tr>
<td>Personal Protective Equipment (PPE)</td>
<td>Any material or device worn to protect a worker from exposure to, or contact with, any harmful material or force.</td>
</tr>
<tr>
<td>Personal Sample</td>
<td>An air sample taken with the sampling pump directly attached to the worker with the collecting filter placed in the worker’s breathing zone.</td>
</tr>
<tr>
<td>Personnel Protection</td>
<td>Notification and instruction of all workers prior to the beginning of a project as to the hazards associated with the job and what they can do to protect themselves from these hazards.</td>
</tr>
<tr>
<td>PF</td>
<td>Protection Factor as provided by a respirator which is determined by dividing the airborne fibre concentration outside of the mask by the concentration inside the mask.</td>
</tr>
<tr>
<td>Phase Contrast Microscopy (PCM)</td>
<td>An optical microscopic technique used for the counting of fibres in air samples, but which does not distinguish fibre types.</td>
</tr>
<tr>
<td>Pneumoconiosis</td>
<td>A condition in the lungs which is a result of having inhaled various dusts and particles for a prolonged period of time.</td>
</tr>
<tr>
<td>Pipe Lagging</td>
<td>The insulation or wrapping around a pipe.</td>
</tr>
<tr>
<td>Pleura</td>
<td>The thin membrane surrounding the lungs, and which lines the internal surface of the chest cavity.</td>
</tr>
<tr>
<td>Polarized Light Microscopy (PLM)</td>
<td>An optical microscopic technique used to distinguish between different types of asbestos fibres by their shape and unique optical properties.</td>
</tr>
<tr>
<td>Polyethylene</td>
<td>Plastic sheeting which is often used to seal off an area in which asbestos removal is taking place for the purpose of preventing contamination of other areas.</td>
</tr>
</tbody>
</table>
Posting

Refers to caution or warning signs which should be posted in any area in which asbestos removal is taking place, or where airborne fibre levels may present a health hazard.

Powered Air Purifying Respirator (PARR)

Either a full facepiece, helmet, or hooded respirator that has the breathing air powered to the wearer after it has been purified through a filter.

Pressure Demand Airline Devices

A respiratory protection device which has a regulator and valve design such that there is a continuous flow of air into the facepiece at all times.

Prevalent Levels

Levels of airborne contaminants occurring under normal conditions.

Prevalent Samples

Air samples taken under normal conditions (background samples).

Protective Clothing

Protective, lightweight garments worn by workers performing asbestos abatement to keep gross contamination off the body.

Pulmonary

Pertaining to or affecting the lungs, or some portion thereof.

Pulmonary Function Tests

A part of the medical examination required to determine the health status of a person’s lungs.

Qualitative Fit Test

A method of testing a respirator which offers the most accurate, detailed information on respirator fit. It involves the introduction of a harmless aerosol to the wearer while he or she is in a test chamber. While the wearer performs exercises which could include facepiece leakage, the air inside and outside the facepiece is then measured for the presence of the harmless aerosol.

Rales

An abnormal sound heard from the lungs which does not necessarily indicate any specific disease.

Random Sample

A sample drawn in such a way that there is no set pattern and is designed to give a true representation of the entire population or area.

Record-keeping

Detailed documentation of all program activities, decisions, analyses, and any other pertinent information to a project.

Resolution

The ability to distinguish between individual objects, as with a microscope.

Respirable

Breathable

Respirator Program

A written program established by an employer which provides for the safe use of respirators on their job sites.

Risk

The likelihood or probability of developing a disease, or being hurt, as the result of exposure to a contaminant or a condition.

Safety Glasses

Protective eye equipment
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning Electron Microscopy (SEM)</td>
<td>A method of microscope analysis which utilizes an electron beam directed at the sample and then collects the beams that are reflected to produce an image from which fibres can be identified and counted.</td>
</tr>
<tr>
<td>Scanning Transmission Electron Microscopy (STEM)</td>
<td>A combination of a transmission electron microscope with scanning and focusing coils so that a beam of electrons can be scanned over the sample or pinpointed in a particular area.</td>
</tr>
<tr>
<td>SCBA</td>
<td>Self-contained Breathing Apparatus</td>
</tr>
<tr>
<td>Shower Room</td>
<td>A room between the clean room and the equipment room in a worker decontamination system in which workers take showers when leaving the work area.</td>
</tr>
<tr>
<td>Spirometer</td>
<td>An instrument which measures the volume of air being expired from the lungs.</td>
</tr>
<tr>
<td>Structural Member</td>
<td>Any load-supporting member such as beams and load-supporting walls of a facility.</td>
</tr>
<tr>
<td>Substrate</td>
<td>The material or existing surface located under or behind the asbestos-containing material.</td>
</tr>
<tr>
<td>Supplied Air Respirator</td>
<td>A respirator that has a central source of breathing air which is supplied to the wearer by way of an airline.</td>
</tr>
<tr>
<td>Surfactant</td>
<td>A chemical wetting agent added to water to improve its penetration abilities into asbestos-containing materials.</td>
</tr>
<tr>
<td>TLV</td>
<td>Levels of contaminants established by the Numerical Conference of Governmental Industrial Hygienists to which it is believed that workers can be exposed to with minimal adverse health effects (United States).</td>
</tr>
<tr>
<td>Transmission Electron Microscopy (TEM)</td>
<td>A method of microscopic analysis which utilizes an electron beam that is focused onto a thin sample. As the beam penetrates (transmits) through the sample, the difference in densities produces an image on a fluorescent screen from which samples can be identified and counted.</td>
</tr>
<tr>
<td>Treated Cellulose</td>
<td>An insulation material made of paper or wood products with fire-retarding treatment added.</td>
</tr>
<tr>
<td>TWA</td>
<td>Time-Weighted Average, as in air sampling.</td>
</tr>
<tr>
<td>Type B Reader</td>
<td>A physician with specialized training in reading x-rays, specifically in recognizing lung disorders.</td>
</tr>
<tr>
<td>Type C Supplied-Air Respirator</td>
<td>A respirator designed to provide a very high level of protection which supplies air to the wearer from an outside source such as a compressor.</td>
</tr>
<tr>
<td>USEPA</td>
<td>United States Environmental Protection Agency.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Visible Emissions</td>
<td>Airborne fibres given off from an asbestos-containing source that are visible to the human eye.</td>
</tr>
<tr>
<td>Visual Inspection</td>
<td>A walk-through-type inspection of the work area to detect incomplete work, damage, or inadequate clean up of a work site.</td>
</tr>
<tr>
<td>Water Damage</td>
<td>Deterioration or delamination of ceiling or wall materials due to leaks from plumbing or cracks in the roof.</td>
</tr>
<tr>
<td>Wet Cleaning</td>
<td>The process of eliminating asbestos contamination from surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water.</td>
</tr>
<tr>
<td>Wetting Agents</td>
<td>Materials that are added to water which is used for wetting the asbestos-containing material in order for the water to penetrate more effectively.</td>
</tr>
<tr>
<td>Workers' Compensation</td>
<td>A system of insurance, required by law and financed by employers, which provides payments to employees or their families for occupational injuries, illnesses, or fatalities incurred while at work resulting in loss of wages or income.</td>
</tr>
</tbody>
</table>
### Non-friable Matrix Bonded Composite Products

<table>
<thead>
<tr>
<th>Substance</th>
<th>Generic Name</th>
<th>Asbestos Percent</th>
<th>Dates of Use</th>
<th>Binder/Sizing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cementitious products</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>extrusion panels: corrugated</td>
<td>8</td>
<td>1965-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>flat</td>
<td>20-45</td>
<td>1930-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>flexible</td>
<td>40-50</td>
<td>1930-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>flexible</td>
<td>30-50</td>
<td>1930-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>perforated laminated</td>
<td>30-50</td>
<td>1930-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>(outer surface) roof tiles</td>
<td>35-50</td>
<td>1930-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>clapboard &amp; shingles</td>
<td>30-20</td>
<td>1930-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>clapboard</td>
<td>12-25</td>
<td>1944-1945</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>siding</td>
<td>12-14</td>
<td>unknown-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>shingles roofing</td>
<td>32-20</td>
<td>unknown-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>shingles pipe</td>
<td>20-15</td>
<td>1935-1977</td>
<td>portland cement</td>
</tr>
<tr>
<td><strong>Flooring, Tile and Sheet Goods</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>vinyl/asbestos tile</td>
<td>21</td>
<td>1950-1977</td>
<td>poly(vinyl)chloride</td>
</tr>
<tr>
<td></td>
<td>asphalt/asbestos tile</td>
<td>26-33</td>
<td>1920-1977</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>sheet goods/resilient sheet</td>
<td>30</td>
<td>1950-1977</td>
<td>dry oils</td>
</tr>
<tr>
<td><strong>Wall covering</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>vinyl wallpaper</td>
<td>6-8</td>
<td>unknown-1977</td>
<td>---</td>
</tr>
<tr>
<td><strong>Paints and coatings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>roof coating</td>
<td>4-7</td>
<td>1900-1977</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>air tight</td>
<td>15</td>
<td>1940-1977</td>
<td>asphalt</td>
</tr>
<tr>
<td><strong>Paper products</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>corrugated: high temperature</td>
<td>90</td>
<td>1935-1977</td>
<td>sodium silicate</td>
</tr>
<tr>
<td></td>
<td>moderate temperature</td>
<td>70-35</td>
<td>1910-1971</td>
<td>starch</td>
</tr>
<tr>
<td></td>
<td>indented</td>
<td>98</td>
<td>1935-1977</td>
<td>cotton &amp; organic binder</td>
</tr>
<tr>
<td></td>
<td>millboard</td>
<td>80-85</td>
<td>1925-1977</td>
<td>starch, lime, clay</td>
</tr>
<tr>
<td>Substance</td>
<td>Generic Name</td>
<td>Asbestos Percent</td>
<td>Dates of Use</td>
<td>Binder/Sizing</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Roofing Felts</td>
<td>smooth surface</td>
<td>10-15</td>
<td>1910-197-</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>mineral surface</td>
<td>10-15</td>
<td>1910-197-</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>shingles</td>
<td>1</td>
<td>1971-1974</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>pipeline</td>
<td>10</td>
<td>1920-197-</td>
<td>asphalt</td>
</tr>
<tr>
<td>Asbestos-Containing</td>
<td>caulking putties</td>
<td>30</td>
<td>1930-197-</td>
<td>linseed oil</td>
</tr>
<tr>
<td>compounds</td>
<td>adhesive (cold applied)</td>
<td>5-25</td>
<td>1945-1975</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>joint compound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>roofing asphalt</td>
<td>5</td>
<td>unknown-197-</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>mastics</td>
<td>5-25</td>
<td>1920-197-</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>asphalt tile cement</td>
<td>13-25</td>
<td>1959-197-</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>roof putty</td>
<td>10-25</td>
<td>unknown-197-</td>
<td>asphalt</td>
</tr>
<tr>
<td></td>
<td>plaster/stucco</td>
<td>2-10</td>
<td>unknown-197-</td>
<td>portland cement</td>
</tr>
<tr>
<td></td>
<td>spackles</td>
<td>3-5</td>
<td>1930-1975</td>
<td>starch, casein</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>synthetic resins</td>
</tr>
<tr>
<td></td>
<td>sealants fire/water</td>
<td>50-55</td>
<td>1935-197-</td>
<td>caster oil or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>polyisobutylene</td>
</tr>
<tr>
<td></td>
<td>cement, insulation</td>
<td>20-100</td>
<td>1900-1973</td>
<td>clay</td>
</tr>
<tr>
<td></td>
<td>cement, finishing</td>
<td>55</td>
<td>1920-1973</td>
<td>clay</td>
</tr>
<tr>
<td></td>
<td>cement magnesia</td>
<td>15</td>
<td>1926-1950</td>
<td>magnesium carbonate</td>
</tr>
<tr>
<td>Asbestos Ebony Products</td>
<td></td>
<td>50</td>
<td>1930-197-</td>
<td>portland cement</td>
</tr>
</tbody>
</table>
## Asbestos Friable Material and Textile Products

<table>
<thead>
<tr>
<th>Substance</th>
<th>Generic Name</th>
<th>Asbestos Percent</th>
<th>Dates of Use</th>
<th>Binder/Sizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friable insulating material</td>
<td>spray-applied insulation</td>
<td>1-95</td>
<td>1935-1970</td>
<td>sodium silicate, portland cement, organic binders</td>
</tr>
<tr>
<td>Preformed Thermal Insulating Products</td>
<td>Kaylo (K-Lo)</td>
<td>15-20</td>
<td>1942-1971</td>
<td>hydrous calcium silicate</td>
</tr>
<tr>
<td></td>
<td>batts, blocks, &amp; pipe covering 85% magnesia</td>
<td>15</td>
<td>1926-1949</td>
<td>magnesium carbonate</td>
</tr>
<tr>
<td></td>
<td>calcium silicate</td>
<td>6-8</td>
<td>1949-1971</td>
<td>calcium silicate</td>
</tr>
<tr>
<td>Textiles</td>
<td>cloth blankets</td>
<td>100</td>
<td>1910-1977-78</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>felts</td>
<td>90-95</td>
<td>1920-197-</td>
<td>cotton/wool</td>
</tr>
<tr>
<td></td>
<td>blue stripe</td>
<td>80</td>
<td>1920-197-</td>
<td>cotton</td>
</tr>
<tr>
<td></td>
<td>red strip</td>
<td>90</td>
<td>1920-197-</td>
<td>cotton</td>
</tr>
<tr>
<td></td>
<td>green stripe</td>
<td>95</td>
<td>1920-197-</td>
<td>cotton</td>
</tr>
<tr>
<td></td>
<td>sheet</td>
<td>95-50</td>
<td>1920-197-</td>
<td>cotton/wool</td>
</tr>
<tr>
<td></td>
<td>cord/rope/yarn</td>
<td>80-100</td>
<td>1920-197-</td>
<td>cotton/wool</td>
</tr>
<tr>
<td></td>
<td>tubing</td>
<td>80-85</td>
<td>1920-197-</td>
<td>cotton/wool</td>
</tr>
<tr>
<td></td>
<td>tape/strip</td>
<td>90</td>
<td>1920-197-</td>
<td>cotton/wool</td>
</tr>
<tr>
<td></td>
<td>curtains (theatre, welding)</td>
<td>60-65</td>
<td>1945-197-</td>
<td>cotton</td>
</tr>
</tbody>
</table>

These lists have been largely derived from the Technical Report R883, Civil Engineering Laboratory, Naval Construction Battalion Center, Port Hueneme, on “Management Procedure for Assessment of Friable Asbestos Insulating Material,” February 1981. A more detailed explanation of the subdivisions listed in the charts can be found in the above referenced document.
Appendix B: Ontario Regulation 278/05
**Occupational Health and Safety Act**

**ONTARIO REGULATION 278/05**

**DESIGNATED SUBSTANCE — ASBESTOS ON CONSTRUCTION PROJECTS AND IN BUILDINGS AND REPAIR OPERATIONS**

**Consolidation Period:** From January 1, 2011 to the e-Laws currency date.

Last amendment: O. Reg. 479/10.

*This is the English version of a bilingual regulation.*

**CONTENTS**

1. Definitions
2. Application
3. Adoption of standard
4. Restrictions re sprayed material, insulation, sealants
5. Information for workers
6. Demolition
7. Ongoing asbestos management in buildings
8. Responsibility of employer other than owner
9. Owner's responsibilities before requesting tender or arranging work
10. Advance notice re Type 3 operations and certain Type 2 operations
11. Type 1, Type 2 and Type 3 operations
12. Respirators
13. Measures and procedures, Type 1 operations
14. Measures and procedures, Type 2 and Type 3 operations
15. Additional measures and procedures, Type 2 operations
16. Additional measures and procedures, glove bag operations
17. Additional measures and procedures, Type 3 operations
18. Instruction and training
19. Asbestos abatement training programs
20. Asbestos work report
21. Asbestos Workers Register
22. Use of equivalent measure or procedure
23. Notice to inspector
24. Bulk material samples
25. Respirators
26. Air samples

**Definitions**

1. (1) In this Regulation,

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

“asbestos-containing material” means material that contains 0.5 per cent or more asbestos by dry weight; (“matériaux contenant de l’amiante”)

“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; (“édifice”)

“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; (“travailleurs compétents”)

“demolition” includes dismantling and breaking up; (“démolition”)

“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; (“examiner”)

“friable material” means material that,

(a) when dry, can be crumbled, pulverized or powdered by hand pressure, or

(b) is crumbled, pulverized or powdered; (“matériaux friables”)

“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; (“filtre HEPA”)

“homogeneous material” means material that is uniform in colour and texture; (“matériaux homogènes”)

“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; (“comité mixte sur la santé et la sécurité”)

“occupier” has the same meaning as in the Occupiers’ Liability Act; (“occupant”)

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

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

“Type 3 operation” means an operation described in subsection 12 (4). (“opération de type 3”)

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.
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 in respect of those workers who are
employed by the employer and engaged in the activities described in clause (1) (e) if, pursuant
    to clause 5 (1) (c) of Ontario Regulation 490/09 (Designated Substances) made under the Act,
    that regulation applies to the employer and those workers with respect to asbestos. O. Reg.
    493/09, s. 1.

(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).

(5) This Regulation does not apply to workers and their employers when the workers are
engaged in the following work under the authority of the Fire Protection and Prevention Act,
1997:

1. Fire suppression.
2. Rescue and emergency services.
3. The investigation of the cause, origin and circumstances of a fire or explosion or
   condition that might have caused a fire, explosion, loss of life or damage to property.
O. Reg. 479/10, s. 1.

(5) While the work described in subsection (5) is being performed at a workplace, this Regulation does not apply to that workplace in respect of the workers engaged in the work and their employers, and Regulation 833 of the Revised Regulations of Ontario, 1990 (Control of Exposure to Biological or Chemical Agents) made under the Act applies. O. Reg. 479/10, s. 1.

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:


(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).

7. Revoked: O. Reg. 422/10, s. 1.

Ongoing asbestos management in buildings

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) 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).

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.


<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>BULK MATERIAL SAMPLES</td>
</tr>
<tr>
<td>Subsection 3 (3)</td>
</tr>
<tr>
<td>Item</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

O. Reg. 278/05, Table 1.

TABLE 2
RESPIRATORS

Paragraph 12 of section 14 and paragraph 11 of section 15
<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work Category</strong></td>
<td><strong>Required respirator</strong></td>
</tr>
<tr>
<td><strong>Type 1 Operations</strong></td>
<td></td>
</tr>
<tr>
<td>Worker requests that the employer provide a respirator to be used by the worker, as described in paragraph 12 of section 14</td>
<td>Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter</td>
</tr>
<tr>
<td><strong>Type 2 Operations</strong></td>
<td></td>
</tr>
<tr>
<td>Work described in paragraph 1 of subsection 12 (3)</td>
<td>One of the following:</td>
</tr>
<tr>
<td></td>
<td>- Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter</td>
</tr>
<tr>
<td></td>
<td>- 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</td>
</tr>
<tr>
<td></td>
<td>- Negative pressure (demand) supplied air respirator equipped with a full-facepiece</td>
</tr>
<tr>
<td></td>
<td>- Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</td>
</tr>
<tr>
<td>Work described in paragraphs 2 to 7 and 9 to 11 of subsection 12 (3)</td>
<td>Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter</td>
</tr>
<tr>
<td>Breaking, cutting, drilling, abrasive, grinding,</td>
<td>Material is not wetted</td>
</tr>
<tr>
<td>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)</td>
<td>- Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter</td>
</tr>
<tr>
<td></td>
<td>- 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</td>
</tr>
<tr>
<td></td>
<td>- Negative pressure (demand) supplied air respirator equipped with a full-facepiece</td>
</tr>
<tr>
<td></td>
<td>- Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</td>
</tr>
<tr>
<td>Material is wetted to control spread of fibre</td>
<td>Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter</td>
</tr>
<tr>
<td><strong>Type 3 Operations</strong></td>
<td></td>
</tr>
<tr>
<td>Breaking, cutting, drilling, abrasive, 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)</td>
<td>Material is not wetted</td>
</tr>
<tr>
<td>as described in paragraph 5 of subsection 12 (4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter</td>
</tr>
<tr>
<td></td>
<td>- 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</td>
</tr>
<tr>
<td></td>
<td>- Negative pressure (demand) supplied air respirator equipped with a full-facepiece</td>
</tr>
<tr>
<td>Work with friable material containing asbestos, as described in paragraphs 1 to 4 and 6 of subsection 12 (4)</td>
<td>Material is not wetted</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>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</td>
<td>Material was applied or installed by spraying, and is wetted to control spread of fibre</td>
</tr>
<tr>
<td>Work with friable material, as described in paragraphs 1 to 4 and 6 of subsection 12 (4), that contains only chrysotile asbestos</td>
<td>spread of fibre</td>
</tr>
<tr>
<td>- - 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</td>
<td></td>
</tr>
<tr>
<td>- - Negative pressure (demand) supplied air respirator equipped with a full-facepiece</td>
<td></td>
</tr>
<tr>
<td>- - Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</td>
<td></td>
</tr>
<tr>
<td>Work with friable material containing asbestos, as described in paragraphs 1 to 4 and 6 of subsection 12 (4)</td>
<td>Material was not applied or installed by spraying, and is wetted to control spread of fibre</td>
</tr>
<tr>
<td>- - 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</td>
<td></td>
</tr>
<tr>
<td>- - Negative pressure (demand) supplied air respirator equipped with a full-facepiece</td>
<td></td>
</tr>
<tr>
<td>- - Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)</td>
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</table>

O. Reg. 278/05, Table 2.

**TABLE 3**

**AIR SAMPLES**

*Paragraph 4 of subsection 18 (6)*

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

O. Reg. 278/05, Table 3.

**Français**

Appendix C: Designated Substance Survey
Asbestos Survey and Limited Designated Substance Survey
Carleton Condominium Corporation No. 6

55 Sumac Street, Ottawa, Ontario

Type of Document: Final

Client: Deerpark Management Limited
52-5450 Canotek Road
Ottawa, Ontario

Project Number: OTT-00211242-A0

Prepared By: Shawn Doherty, P.Eng
Reviewed By: Carl Hentschel, P.Eng.

exp Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 7H6
Canada

Date Submitted
April 8, 2013
Asbestos Survey and Limited Designated Substance Survey
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Shawn Doherty, P.Eng
Environmental Engineer

Carl Hentschel, P.Eng.
Environmental Engineer

Date Submitted:
April 8, 2013
Legal Notification

This report was prepared by exp Services Inc. for the account of Deerpark Management Limited and Carleton Condominium Corporation No. 6.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Exp Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.
Executive Summary

Exp Services Inc. (exp) was retained by Mr. David Duncan of Deepark Management Limited on behalf of Carleton Condominium Corporation No. 6 to complete an asbestos survey and limited Designated Substance Survey (DSS) of condominium complex occupied by 13 row house blocks and six 3-storey condominium apartment buildings.

The row house buildings are generally described as two-storey, wood-constructed, buildings with full basements. The row house buildings generally consist of five to fifteen residential units all with separate access. The interior building construction consists of drywall interior finishes, stippled ceiling and various flooring applications. The exterior consists of a range of a mix of brick and siding applications and asphalt shingled roof. Pebble dash was noted on the end siding on some of the condo blocks.

The apartment buildings consist of three-storey, wood-framed, buildings with a total of fifteen apartment buildings. The buildings are complete with finished basements. The apartment units are accessed via central corridors and main lobbies. Additional common spaces include laundry facilities, garbage rooms, storage room and stairwells. The interior construction consists of drywall walls with some stippled coatings and various flooring applications. The exterior construction finishes of brick and siding.

The recreational centre consists of a high-ranch style, wood-framed, building. The upper-floor of the building consists of function room and washrooms whereas the bottom floor consists of washrooms and a board room. The building interior consists of drywall walls and ceiling, and vinyl floor tile applications. The exterior consists of masonry brick and wood siding.

The main objectives of the study were:

- To identify the presence / absence of asbestos within the building;
- To quantify the amounts of asbestos within the building; and,
- To evaluate if the asbestos poses a health risk to constructors and building occupants, and to make recommendations to eliminate such risks. An asbestos management plan was completed to be read in conjunction with this report.

While conducting an asbestos survey, a limited DSS was conducted:

- To identify the presence of designated substances listed in the Occupational Health and Safety Act (OHSA) and other special handling materials;
- To evaluate if such substances pose a health risk to constructors, and to make recommendations to eliminate such risks in the future; and,
- To provide a framework for general regulation and practices that need to followed when conducting renovation work.

The focus of the study was with respect to identifying the presence/absence of asbestos-containing materials within the building.

The survey included a cursory review of the designated substances as defined by the Ontario Occupational Health and Safety Act (OHSA), with particular emphasis placed on (but not limited to): asbestos-containing materials (ACMs); lead-based paints and lead-containing materials; mercury-based paints and mercury-containing equipment; and, potential sources of silica. Some samples of paint were collected from common space and/or exterior of the building. Not all paint colours were sampled to minimize potential for damage.
Based on the completion of the asbestos survey and limited DSS, the following designated substances and special handling materials were identified at the site.

### Table EX-1: DSS SUMMARY

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>DESCRIPTION</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos</td>
<td>Drywall Filler Compound</td>
<td>Prior to any renovation that would disturb the drywall compound, it is recommended that this material be removed using Type 2 removal operations as per Section 15 and 16 of O.Reg. 278/05.</td>
</tr>
<tr>
<td></td>
<td>- Row houses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Apartments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Recreation Centre</td>
<td></td>
</tr>
<tr>
<td>Stippled Plaster</td>
<td>- Row house ceiling</td>
<td>Prior to any building renovation which would disturb this stippled material, it is recommended that stippled plaster be removed using Type 3 removal operations as per Section 18 of O.Reg. 278/05.</td>
</tr>
<tr>
<td></td>
<td>- Apartment ceiling, hallway walls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Recreation centre ceiling</td>
<td></td>
</tr>
<tr>
<td>Exterior Pebble</td>
<td>- Select row houses</td>
<td>Prior to any building renovation which would disturb this pebble dash, it is recommended that stippled plaster be removed using Type 3 removal operations as per Section 18 of O.Reg. 278/05.</td>
</tr>
<tr>
<td>Exterior Brown Caulking</td>
<td>- Select row house, select apartment, recreation building (door)</td>
<td>Additional samples can be collected to confirm the presence / absence of asbestos within caulking. If confirmed asbestos, prior to any building renovation which would disturb this caulking, it is recommended that caulking be removed using Type 1 removal operations as per Section 14 of O.Reg. 278/05.</td>
</tr>
<tr>
<td>Exterior White Caulking</td>
<td>- Apartment buildings</td>
<td>Prior to any building renovation which would disturb this caulking, it is recommended that caulking be removed using Type 1 removal operations as per Section 14 of O.Reg. 278/05.</td>
</tr>
<tr>
<td>Lead-Based Paint</td>
<td>Beige trim</td>
<td>Provide workers with appropriate personal protective equipment (i.e., respirators, gloves and eye protection) during any future renovations. Minimize activities involving abrasion or sanding of painted surfaces. Refer to the Ontario Guideline – Lead on Construction Projects, April, 2011</td>
</tr>
<tr>
<td></td>
<td>- Row Houses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Off-white wall paint</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Apartment buildings</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Recreational Centre</td>
<td></td>
</tr>
<tr>
<td>Mercury</td>
<td>Limited number of fluorescent light tubes and thermostats</td>
<td>Prior to any renovations requiring the disturbance of mercury containing equipment, remove and re-use/recycle or dispose of all mercury-containing equipment in accordance with applicable regulations. Where possible, fluorescent light tubes should be recycled at an approved recycling facility.</td>
</tr>
<tr>
<td>SUBSTANCE</td>
<td>DESCRIPTION</td>
<td>Recommendation</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>----------------</td>
</tr>
<tr>
<td>PCBs</td>
<td>Limited number of ballasts</td>
<td>The ballasts (if PCB-bearing) are to be removed and disposed of in accordance with O.Reg. 347, if determined to be PCB-containing.</td>
</tr>
<tr>
<td>Silica</td>
<td>Drywall Walls, Concrete foundations, Concrete basements and floors, Exterior pebble dash</td>
<td>Wet silica-containing area(s) prior to being disturbed and provide daily wet sweeping or HEPA vacuuming of silica dust to minimize generation of dust. Provide workers with appropriate respiratory protection and utilize ventilation during disturbance of silica-containing structures. Refer to the Ontario Guideline – Silica on Construction Projects, April 2011</td>
</tr>
</tbody>
</table>
# Table of Contents

Legal Notification ......................................................................................................................... i

Executive Summary ..................................................................................................................... EX-i

1 Introduction and Background ................................................................................................. 1
   1.1 Introduction ......................................................................................................................... 1
   1.2 Background ......................................................................................................................... 1
   1.3 Objectives ............................................................................................................................ 1
   1.4 Scope of Work ......................................................................................................................... 2

2 Survey Methodology and Assessment Criteria ..................................................................... 3
   2.1 Site Inspection ...................................................................................................................... 3
   2.2 Asbestos-Containing Materials .......................................................................................... 3
   2.3 Lead-Based Paints and Lead-Containing Materials ............................................................. 5
   2.4 Mercury-Containing Equipment ......................................................................................... 5
   2.5 Other Designated Substances ............................................................................................. 5

3 Survey Findings and Recommendations .............................................................................. 6
   3.1 Asbestos-Containing Materials ......................................................................................... 6
      3.1.1 Row House Complex .................................................................................................... 6
         3.1.1.1 Friable Materials .................................................................................................... 6
         3.1.1.2 Non-Friable ........................................................................................................... 7
      3.1.2 Apartment Buildings ................................................................................................... 8
         3.1.2.1 Friable Asbestos .................................................................................................. 8
         3.1.2.2 Non-Friable ........................................................................................................ 9
      3.1.3 Recreational Centre ..................................................................................................... 10
         3.1.3.1 Friable ................................................................................................................ 10
         3.1.3.2 Non-Friable ........................................................................................................ 10
   3.2 Lead-Based Paints and Lead-Containing Materials ........................................................... 11
   3.3 Mercury-Containing Equipment ....................................................................................... 11
   3.4 Silica ................................................................................................................................... 12
   3.5 Other Designated Substance .............................................................................................. 13
   3.6 PCB-Containing Equipment .............................................................................................. 13
   3.7 Ozone-Depleting Substances ............................................................................................. 13
   3.8 Urea-Formaldehyde Foam Insulation .................................................................................. 14
   3.9 Bird and Animal Droppings ................................................................................................ 14
List of Appendices

Appendix A – Figures
Appendix B – Site Photographs
Appendix C – Summary Tables
Appendix D – Laboratory Certificates of Analysis
Appendix E – Hazard Ranking Table

List of Tables

<table>
<thead>
<tr>
<th>Table EX-1: DSS SUMMARY</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1: Minimum of Asbestos Bulk Material Sample Requirements</td>
<td>4</td>
</tr>
</tbody>
</table>

3.10 Visible Mould .................................................................................................................. 14
4 General Limitations.............................................................................................................. 15
1 Introduction and Background

1.1 Introduction

Exp Services Inc. (exp) was retained by Mr. David Duncan of Deerpark Management Limited on behalf of Carleton Condominium Corporation No. 6 to complete an asbestos survey and limited Designated Substance Survey (DSS) of condominium complex occupied by 13 row house blocks and six condominium apartment buildings.

1.2 Background

The row house buildings are generally described as two-storey, wood-constructed, buildings with full basements. The row house buildings generally consist of five to fifteen residential units all with separate access. The interior building construction consists of drywall interior finishes, stippled ceiling and various flooring applications. The exterior consists of a range of a mix of brick and siding applications, with some units having pebble-dash finishes on the ends.

The apartment buildings consist of three-storey, wood-framed, buildings with a total of fifteen apartment buildings. They are complete with full basements. The apartment units are accessed via central corridors and main lobbies. Additional common spaces include laundry facilities, garbage rooms, storage room and stairwells. The interior construction consists of drywall walls with some stippled coatings and various flooring applications. The exterior construction finishes of brick and siding as well as asphalt shingles.

It is our understanding that each condominium block was constructed separately (i.e. the potential for materials to vary slightly from condominium block to condominium block). However, within each block, it is assumed that all of the units within a specific block would have been constructed at the same time and with similar materials to form one building. The same applies to the apartment buildings to which each unit would have similar materials.

The recreational centre consists of a high-ranch style, wood-framed, building. The upper-floor of the building consists of function room and washrooms whereas the bottom floor consists of washrooms and a board room. The building interior consists of drywall walls and ceiling, and vinyl floor tile applications. The exterior consists of masonry brick and wood siding.

1.3 Objectives

The main objectives of the study were:

- To identify the presence / absence of asbestos within the building;
- To quantify the amounts of asbestos within the building; and,
- To evaluate if the asbestos poses a health risk to constructors and building occupants, and to make recommendations to eliminate such risks. An asbestos management plan was completed to be read in conjunction with this report.

While conducting an asbestos survey, a limited DSS was conducted:

- To identify the presence of designated substances listed in the Occupational Health and Safety Act (OHSAA) and other special handling materials;
- To evaluate if such substances pose a health risk to constructors, and to make recommendations to eliminate such risks in the future; and,
To provide a framework for general regulation and practices that need to followed when conducting renovation work.

1.4 Scope of Work

To accomplish the above noted objectives, the following scope of work was followed:

- Conduct a systematic inspection of all accessible units of the building to document the location, type, quantity and condition of asbestos-containing materials (for units accessed, refer to Figure 1);
- Collect and record representative building material samples for potential laboratory analysis;
- Submit representative samples for bulk asbestos; and,
- Interpret analytical results and prepare a detailed stand-alone survey report identifying the type, location and condition of the asbestos survey for the complex.

In addition to the asbestos survey, the limited DSS included all of the designated substances defined by the OHSA, with particular emphasis placed on (but not limited to):

- Lead based paints (not assessed in detail within units) and submit samples for lead analysis;
- Mercury-containing equipment; and,
- Potential sources of silica.

Special handling materials that were incorporated into the survey include:

- PCB-containing equipment;
- Ozone-depleting substances;
- Urea-formaldehyde foam insulation;
- Bird and animal droppings; and,
- Mould.

It is noted that a cursory review for the aforementioned materials was conducted within the units whereas a more detailed lead-paint sampling program was conducted in the common spaces. The intention of the DSS was to provide a general overview of the site materials and was not conducted as a pre-renovation and/or demolition DSS.
2 Survey Methodology and Assessment Criteria

2.1 Site Inspection

Exp conducted the survey on February 26, 27, March 6, 21, and 22, 2013. Electronic floor plans of the buildings were not provided by the client prior to the site visit.

The asbestos survey and DSS consisted of a thorough systematic inspection of all accessible areas of a unit from each condo block, between one to two apartment units within each apartment building, the recreational centre and all common element spaces to document the location, type, quantity and condition of designated substances and special handling materials. The following limitations were present as part of the site visit:

- It is noted that void spaces behind or within walls and structural supporting walls could not be assessed in all instances and additional materials may be present within these void spaces.
- The attic space within each unit was inspected as much as access allowed.
- Samples were not collected from the roof materials to minimize potential water damage;
- Access was provided to one unit per condominium block as a minimum and one to two units per apartment unit;
- Access was not provided to the main board room in the recreational building;
- Sampling programs were conducted in a manner to minimize any visual damage;
- No paints were collected from within individual units as those would have varying paints which is not indicative of common elements;
- Flooring materials were not commonly collected within individual units since they can often be replaced without knowledge of the condominium board and can vary within the units.
- Row house block 50 was not accessed during the survey. It is noted that a report was prepared for a unit within this block (unit A). The report is currently with the property manager for the building.

Refer to Figure 1 for the layout of the units accessed as per the survey.

Selected photographs taken during the survey have been included in Appendix B. Details regarding the approach used in conducting the field investigation including sampling procedures and analytical methodologies are outlined in the following sections.

2.2 Asbestos-Containing Materials

The asbestos survey was undertaken in general conformance with Ontario Regulation 278/05 (O.Reg. 278/05), Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations which is the current governing Regulation on the detection and handling of asbestos.

During the survey, minor destructive test openings were made in some materials where access permitted. Potential ACMs were classified as being either friable or non-friable. Friable material is defined as: material that, when dry, can be crumbled, pulverized or powdered by hand pressure, or is crumbled, pulverized or powdered.

Two hundred and thirty five (235) samples were submitted for laboratory analysis. This number was based on the Table 1 described below, which specifies the minimum sampling requirements as per O.Reg. 278/05 and based on observations pertaining to like building materials.
The sampling program consisted of the assessment of a unit for each condominium block. The locations of the units (i.e. end unit vs. middle unit) varied based on the block of buildings to provide representation of potential variations in construction application based on the location of a unit within a specific block. With respect to exterior materials, sample locations varied within the blocks. The same sampling procedure applied to the condominium apartment buildings as the locations of the units assessed varied within the various buildings. Common area samples varied throughout the buildings and efforts to sample materials on various floors was conducted for spatial representation.

Where one sample from a given materials within a building / block is deemed to be asbestos containing, the remainder of the material is to be considered asbestos. As such, drywall compound from one room is considered to be the same as another room if the material appears to be homogeneous. As such, a building material sample collected from a certain area can be extrapolated to represent other areas within the same building of a similar construction. This stems from the visual evidence relating to the similarity of the building materials and the assumption that these materials would have been placed / erected at the same time during the same construction project. Where evidence indicates that this is not the case, additional characterization is required.

All asbestos samples were submitted to Crisp Analytical Laboratories in Baton Rouge, Louisiana, which is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) by the National Institute of Standards and Technology for analysis of bulk materials for asbestos.

Table 1: Minimum of Asbestos Bulk Material Sample Requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Type of Material</th>
<th>Size of Area of Homogeneous Material</th>
<th>Minimum Number of Bulk Material Samples to be Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>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</td>
<td>Less than 90 square metres</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>90 or more square meters, but less than 450 square metres</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>450 or more square metres</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Thermal insulation, except as described in item 3</td>
<td>Any size</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Thermal insulation patch</td>
<td>Less than 2 linear metres or 0.5 square metres</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Other material</td>
<td>Any size</td>
<td>3</td>
</tr>
</tbody>
</table>

Analyses were performed in accordance with the method outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* made under the Occupational Health and Safety Act Ontario Regulation 278/05, IRSST Method 224-1 and the EPA/600/R-93-116 Method for the Determination of Asbestos in Bulk Building Materials, which is in accordance with Quebec requirements.

In Ontario, ACMs are defined as any material found to contain 0.5% or more asbestos by volume, as determined by the standard polarized light microscopy (PLM) method. The results of the ACM sampling are summarized in Section 3.1.

Having identified building materials and areas containing asbestos, a comprehensive hazard assessment was performed. The degree of hazard associated with asbestos containing materials depends upon on the following factors: accessibility, condition, friability, activity level, exposed surface area, type of asbestos and percentage of asbestos content. The hazard ranking tree can be referenced in Appendix E.
2.3 **Lead-Based Paints and Lead Containing Materials**

Assessment of lead-based paints and lead-containing materials was limited to the common elements only as exp did not want to cause excessive damage. Select painted areas of significant size and different colours were sampled and analyzed for lead and mercury. Areas where several layers of paint existed did not necessarily have identification of each layer unless the paint was in poor condition. However, every attempt to identify the number and colours of the layers was made.

A total of twenty-seven (27) samples were collected from the exterior common areas of the condominium blocks and interior common areas within the apartment buildings. The number of paint samples was considered representative based on observations pertaining to contiguous areas showing similar painted surfaces. Since paint is processed in large batches, paint composition is assumed to be spatially consistent during and after application.

All paint chip samples were submitted to Crisp Analytical Laboratories, which is accredited by the American Industrial Hygiene Association (AIHA) National Lead Laboratory Accreditation Program (NLLAP). Analyses were performed by Atomic Absorption Spectrophotometry (AAS).

According to the Surface Coating Materials Regulations, paints having a lead content greater than 90 mg/kg (90 ppm) are considered to be lead-based. However, the concern stems from poor condition paint and lead-debris being generated.

The results of the lead sampling are summarized in Section 3.2.

2.4 **Mercury-Containing Equipment**

The buildings were visibly inspected for equipment that could release mercury liquid/vapour during on-going building maintenance. The results of the mercury inspection are summarized in Section 3.3.

2.5 **Other Designated Substances**

A visual survey of the buildings was made to identify the presence of any other designated substances including:

- Silica;
- PCB-containing equipment;
- Ozone-depleting substances;
- Urea-formaldehyde foam insulation;
- Bird and animal dropping;
- Mould; and,
- Coke oven emissions, acrylonitrile, arsenic, benzene, ethylene oxide, isocyanates, and vinyl chloride.

The visual survey consisted of identifying the aforementioned substances or other materials/equipment that are commonly associated with these substances. The results are summarized in Section 3.4 through Section 3.10.
3 Survey Findings and Recommendations

Pertinent site photographs are presented in Appendix B. A summary of the analytical results is presented in Appendix C. The laboratory certificates of analysis are included in Appendix D.

3.1 Asbestos-Containing Materials

3.1.1 Row House Complex

It is our understanding that basements were unfinished at the time of building construction. Any drywall compound and/or stippled surfaces within the basement were completed by the owner and materials would vary depending on the unit. Exp cannot confirm the presence / absence of asbestos within non-common materials within the basement and it would be the responsibility of the owner to assess the presence / absence of asbestos within the basement prior to renovation.

3.1.1.1 Friable Materials

Drywall Filler Compound

The drywall filler compound was sampled from the interior walls within a minimum of one unit per condominium block. A minimum of one sample per unit was shown to exceed 0.5% asbestos. It is noted that the majority of the samples displayed levels of chrysotile asbestos ranging from 2 to 3% of chrysotile asbestos. It is also noted that best efforts were conducted to collect a minimum of one sample per floor within each unit with the exception of the basement. Samples were collected at a minimum from the main level, the 2nd level and from the basement stairwell which is original.

It is noted that the drywall compound within the main, 2nd floors and all stairwells was determined to consistently contain asbestos. This applies to each block since a unit from each block was accessed. Given that similar results were observed within each of the condominium blocks, it is our opinion that construction materials are similar from row house block to row house block. As such, all homogeneous drywall compound is to be assumed asbestos within the entire row house complex with the exception of the basements, which may have been completed by owners.

Based on the above, one must assume that the drywall compound throughout the apartment building is asbestos-containing unless the unit owner or occupant can confirm that the drywall has been renovated since 1990.

Within the units assessed, the drywall compound was generally observed to be in good condition, was bound well to the drywall and is behind of a coat of paint and is attributed a hazard ranking of 6. Some general wear was noted on the compound but nothing requiring immediate wear or no evident debris and these isolated locations would be attributed a ranking of 3 to 4.

Recommendation: Based on the nature of the drywall compound material, Type 2 operations as per Section 15 and 16 of O.Reg.278/05 are to be used for the drywall compound removal if it is to be disturbed. Otherwise, it can be managed in place.

Stippled Ceilings

The stippled ceiling was sampled within a minimum of one unit per condominium block. Samples were collected from each floor when feasible and it is noted that the stippled ceilings were generally present throughout the majority of the units, with the exception of isolated rooms such as kitchens and/or in previously renovated areas. A minimum of one sample from each unit assessed was shown to exceed the criteria of 0.5% asbestos. The majority of the samples displayed levels between 2 to 5% with several samples per unit displaying exceedences. Based on the number of exceedences (i.e. more than one per
unit), it can be said that the asbestos-containing stippled ceiling is common throughout the condominium blocks.

Within the units assessed, the stippled ceiling was generally observed to be in good condition, is applied to the ceiling (i.e. out of reach without ladder or step stool) and as such is attributed a hazard ranking of 6.

**Recommendation:** Based on the nature of the stippled material, Type 3 operations as per Section 15 to 18 of O.Reg.278/05 are to be used for the stippled plaster removal, if it is to be disturbed. Otherwise, it can be managed in place.

**Pebble Dash**

Pebble dash material was on the exterior of end walls of specific row house blocks. This included blocks 50, 53 and 908. Three samples were collected from each end wall and asbestos concentrations of 1% chrysotile were identified. Although just identified on these three blocks, there is the potential that the pebble dash is located behind the siding on the ends of the other row house blocks within the complex.

The material is generally in good condition and takes some force to disturb it. Also, the material was limited to the exterior of the building. As such, the pebble dash material is attributed a hazard ranking of 7.

**Recommendations** Based on the nature of the pebble dash material, Type 3 operations as per Section 15 to 18 of O.Reg.278/05 are to be used for the removal of the pebble dash material, if it is to be disturbed. Pebble dash is often referred to as non-friable but it is our opinion that the material can generate dust when crumbled and one cannot remove it with manual equipment and/or with generating dust. Otherwise, it can be managed in place.

**No other friable materials and/or suspected to contain asbestos-containing materials were observed during the survey.**

3.1.1.2 Non-Friable

Various caulking / adhesives were observed around windows, door and trims between vinyl siding and brick. Adhesives were noted to be varying levels of brown and whites. It is understood that caulking and adhesives sampling is limited in nature to minimize damage to window and door seals (i.e. a limited number of samples are collected and thorough review of the materials behind paint colours or multiple layers cannot be conducted).

**Brown Caulking / Adhesives**

The brown caulking from 904 block was found to contain asbestos levels of 3% chrysotile. Conversely, a darker brown adhesive was observed within the 902 block of the complex and was only found to contain trace levels of asbestos (i.e. well below 0.5%) and is not deemed to contain asbestos. Similarly, a brown sealant was also observed on the 912 block but was found to not contain any detectable asbestos.

Based on the varying levels of asbestos within the caulking, it is anticipated that small variations (level of asbestos) within the brown caulking are present throughout the complex. Unless more samples of brown sealant are collected from each block (which was not conducted to minimize potential water leaks and/or breaks in building seals), it is difficult to confirm that the brown sealant from an entire block is not asbestos. In addition, some of the adhesives are painted and the colour cannot be determined unless one starts removing it. As such, it would be very difficult to differentiate the material by eye for any contractor and/or maintenance staff. Based on the above, it is our opinion that any brown caulking be assumed asbestos-containing until confirmed otherwise following more sampling.

The brown adhesive is assumed to contain asbestos, it is noted that the material is non-friable, is in good condition and difficult to sample (i.e. difficult to disturb). Therefore, the material is attributed a hazard ranking of 7.
Recommendations: It is recommended that prior to any removal of brown sealant and/or caulkling, a sample can be collected from the location in question to confirm the presence / absence of asbestos prior to disturbing the material. Alternatively, one can assume the brown caulkling / adhesive to be asbestos.

If confirmed to be asbestos, the caulkling / sealant can be removed using Type 1 operations. The measures and procedures to be followed are outlined in Section 14 of the regulation.

The following non-friable materials were observed, sampled and determined not to contain asbestos:

- White caulkling / adhesive.

No suspect caulkling and/or sealants were observed within the interiors of the dwellings.

Note: Some suspect original floor tiles were observed in select units but were not sampled to prevent damage to unit owner finishes. Based on the age of the tiles, they may contain asbestos and should be assumed as such prior to disturbing them. The floor tiles are described as beige with brown spots/streaks.

3.1.2 Apartment Buildings

3.1.2.1 Friable Asbestos

Drywall Compound

Drywall compound from within the apartment buildings was collected from within a minimum of one residential unit and within a common space from each floor to provide spatial representation of the samples. A minimum of one sample from each apartment building was shown to contain above 0.5% of chrysotile asbestos. It is noted that the majority of samples collected displayed asbestos concentrations ranging between 1 to 2% asbestos and was also observed within both the privately owned unit spaces and the common space. Only isolated drywall compound samples were shown to be non-detectable and likely stem from patches or renovated areas. As such, one must assume that the drywall compound throughout the apartment building are asbestos-containing unless the unit owner or occupant can confirm that the drywall has been renovated since 1990.

Both in the units and the common spaces (i.e. hallway, laundry room), the drywall compound was determined to be in good condition, is limited to seams and screws, and is generally bound to the drywall. As such, the drywall compound is associated a hazard ranking of 6.

Recommendation: Based on the nature of the drywall compound material, Type 2 operations as per Section 15 and 16 of O.Reg.278/05 are to be used for the drywall compound removal. However, the drywall compound removal can be combined with the exterior pebble dash removal program discussed below.

Stippled Plaster Walls / Ceilings

Stippled plaster applications are present on the ceilings throughout the entire apartment buildings (units and common spaces). Similarly, a thinner stippled application was noted on the walls in common areas as well but was covered on the wall, however, behind a thicker layer of paint and thus giving the stippled a different visual appearance.

Samples of the stippled plaster were collected from ceilings within a minimum of one unit and from each floor within the apartment buildings. were not commonly collected from the stipple material along the hallway walls as optimal sample locations were not common. (Note: paint samples collected from the hallway walls subsequently submitted for asbestos analysis. It is understood that the samples were combined with higher levels of lead paint).

Within all of the apartment buildings, at least one sample per apartment building was deemed to contain at least 0.5% of chrysotile asbestos. It is noted that the majority of the samples submitted both from the
units and the common spaces were determined to contain between 3 to 5% asbestos. Given that multiple samples per building contains asbestos, one must assume that all stipple material is asbestos containing and that the application of stipple (mixes, level of asbestos content) within the apartments did not vary significantly.

It is also noted that the lead paint samples submitted from the hallway walls also showed trace levels of asbestos. It is our opinion that a sample from the wall without the coats of paint would have shown a higher level of asbestos and is also to be considered asbestos for the purpose of this survey. Nevertheless, any drywall compound behind the stipple also contains asbestos.

It is exp’s opinion that the stipple is in good condition but the stippled on the common area walls is more easily disturbed and is thus attributed a hazard ranking of 5. The ceiling stipple is attributed a rank of 6 as it is out of reach of the general public.

Recommendation: Based on the nature of the stippled material, Type 3 operations as per Section 15 to 18 of O.Reg.278/05 are to be used for the stippled plaster removal, if it is to be disturbed. Otherwise, it can be managed in place.

With respect to the wall stipple, it is recommended that one conduct a more extensive wall sampling program to confirm determine whether the wall stipple has asbestos concentrations above 0.5% prior to any renovation program that would require damaging this material. At this time, one can collect larger samples and differentiate between the paint, drywall compound and stipple to determine the type of abatement operations (i.e. Type 2 for drywall compound and/or type 3 for stipple).

No other suspect friable materials suspected of containing asbestos were observed within the apartment buildings.

3.1.2.2 Non-Friable

The various caulking / adhesives were observed around windows, door and trims between vinyl siding and brick. Adhesives were noted to be brown, whites and off-whites. Caulking and sealant sampling is limited in nature to minimize damage to window and door seals (i.e. a limited number of samples are collected and thorough review of the materials behind paint colours or multiple layers cannot be conducted). Three samples of each colour of adhesive / caulking was collected from each building to meet the sampling requirements.

White Siding Caulking / Adhesive

White caulking / adhesive associated with the siding on Building 49, 896 and 900 were determined to contain between 1 to 5% chrysotile asbestos. With the exception of some white caulking / adhesive associated with the doors at building 896, all other samples for white caulking / adhesive was determined to contain asbestos. As such, white caulking / adhesive should be considered asbestos throughout the apartment buildings.

The material is non-friable and was in good condition, as such is associated a hazard ranking of 7.

Dark Brown Caulking / Adhesive

Brown caulking / adhesive sampled from Building 51 was determined to contain 3% chrysotile asbestos. Detectable levels of asbestos was not identified within the other apartment buildings. As such, the presence of asbestos within the dark brown caulking / adhesive is limited to Building 51.

The material is non-friable and was in good condition, as such is associated a hazard ranking of 7.

Recommendations: Based on the non-friable nature of the caulking / adhesive, it can be removed using Type 1 operations as per Section 14 of O.Reg. 278/05 if the material is to be removed.
The following materials were observed, samples and determined not to contain asbestos:

- 36" by 36" beige vinyl floor tile; and,
- Brown adhesive in all apartment buildings with the exception of Building 51

3.1.3 Recreational Centre

3.1.3.1 Friable

Drywall Compound

Five drywall compound samples were collected from the building. The drywall compound was shown to contain between 2 to 3% chrysotile asbestos within the basement floor whereas asbestos was not detected in the function room. In addition, the laboratory analysis comparison on the drywall compound from the function room and the basement display found the two different drywall compounds. As such, there is the potential that drywall finish with the function room is non-asbestos-containing (additional samples could confirm this as per the regulation).

The drywall compound was in good condition, well adhered to the drywall and behind a layer of paint. As such, it is attributed a hazard ranking of 6.

Recommendation: Based on the nature of the drywall compound material, Type 2 operations as per Section 15 and 16 of O.Reg.278/05 are to be used for the drywall compound removal.

Stippled Ceiling

Five stippled ceiling samples were collected from the building. The stippled material was shown to contain 3 to 5% chrysotile asbestos. The stippled material was common to all ceilings. The material was in good condition, is out of reach of the general public and thus associated a hazard ranking of 6 (with the exception of some damaged area in the basement landing – ranking of 3).

Recommendation: Based on the nature of the stippled material, Type 3 operations as per Section 15 to 18 of O.Reg.278/05 are to be used for the stippled plaster removal, if it is to be disturbed. Otherwise, it can be managed in place.

No other suspect friable materials suspected of containing asbestos were observed within the apartment buildings.

3.1.3.2 Non-Friable

Brown Adhesive / Caulking

Dark brown caulking observed around the doors was sampled and determined to contain 2% of chrysotile asbestos. The caulking was observed to be hard and limited to the doors.

The material was in good condition, non-friable and thus attributed a hazard ranking of 7.

Recommendations: Based on the non-friable nature of the caulking / adhesive, it can be removed using Type 1 operations as per Section 14 of O.Reg. 278/05 if the material is to be removed

The following materials were observed, sampled and determined not to contain asbestos

- Soft brown window caulking;
- White caulking; and,
- 12" by 12" grey vinyl floor tile.
3.2 Lead-Based Paints and Lead-Containing Materials

Row Houses

The sampling of paints from the row houses was limited to the outside of the condo blocks to areas that the removal of paint would not be evident. As such, only six samples of paint were collected. Four of the six samples were confirmed to be lead-based (i.e. above 90 ppm).

Based on the results, the following painted surfaces with respect to the condo blocks are to be considered lead-based paints:

- Beige trim paint: The beige paint observed on the various exterior trim generally contains lead content between 109 to 985 ppm. The trim was generally in good condition with no debris.

With regards to the white paint on the trim, the samples were not confirmed to be lead containing. One of the samples was confirmed to be less than 90 ppm whereas the other sample could not meet the required detection limit.

Apartment Buildings and Recreational

The sampling of the paints within the apartment buildings consisted of the collection of the commonly identified colours within the common elements. These colours were collected from each building. As such, exp collected off-white wall paint, beige trim and white ceiling paint from within each apartment building. Based on the results, the following painted surfaces contain lead paint:

- Off-white wall paint: The off-white wall paint consistently contained lead in all apartment building in concentrations ranging from around 90 ppm upwards to around 500 ppm of lead. The paint was generally observed to be in good condition and is not considered to be a concern.

It is noted that the white paint and the beige trim were not commonly identified to contain lead. Beige trim paint was identified in the order of around 90 ppm but was generally noted to be below 90 ppm.

Recommendations: Necessary protective equipment should be worn to reduce the risk of lead-dust inhalation to any workers if the identified painted surfaces are being renovated or demolished (i.e. via sledgehammer or any other means). Activities involving abrasion or sanding of painted surfaces should be minimized. Appropriate personal protective equipment (i.e., respirators, gloves and eye protection) should be worn when undertaking any such activities. The ministry of Labour's Guideline “Lead on Construction Projects”, April, 2011 are to be referred to when dealing with any paints that may have traces of lead below the regulatory criteria.

3.3 Mercury-Containing Equipment

Row House Units

Within the units assessed, fluorescent lighting was not commonly observed and as such, excessive levels of mercury vapours via fluorescent light tubes is not anticipated. The lighting is the standard incandescent lighting that can easily be switched to compact fluorescent lights which have minimal amounts of vapour.

Similarly, the majority of the thermostats were observed to be electric however some thermostats were identified to be mercury containing. Without removing the exterior casings and accessing all units, there is the potential for some remaining mercury thermostats to be present in isolated units. There mercury is contained within the thermostat and not considered a concern.
Apartment Buildings

Fluorescent lighting within the apartment buildings is limited to two light tubes within the respective laundry rooms. The remaining of the lighting is the standard incandescent lighting that can easily be switched to compact fluorescent lights which have minimal amounts of vapour. The thermostats observed throughout the units and the common spaces is electric within the areas assessed. However, without removing every case, there is the potential that some remnant mercury thermostats may be present.

Recreation Building

The mercury containing equipment within the recreational building is limited to a single mercury thermostat. There are no fluorescent lights (note that the main board room was not accessed).

Recommendations: Exposure to mercury is regulated under Ontario Regulation 844/90 (amended to O.Reg. 110/04) and Ontario Regulation 347. All mercury containing material and equipment should be removed and re-used/recycled or disposed prior to renovation in accordance with applicable regulations, if they are to be disturbed as part of the renovation program.

Based on the limited number of the fluorescent light tubes, they can be accumulated and disposed of at local waste depot.

3.4 Silica

Row Houses, Apartment Buildings and Recreational Building

Materials that likely contain silica within the buildings are as such:

- Concrete foundations and poured basement floor;
- Drywall;
- Exterior masonry brick;
- Exterior pebble dash; and,
- Exterior concrete parging on the base of the buildings.

No significant evidence of concrete and/or plaster debris was identified that would be considered as silica-associated debris and would require immediate action.

Recommendations: Airborne silica can be generated through such processes as blasting, grinding, crushing, and sandblasting silica-containing material. Precautions must be taken to prevent silica-containing particles from becoming airborne during the application of such processes. Such precautions include wetting of silica-containing area(s) to be disturbed and daily wet sweeping or HEPA vacuuming of silica dust. Additionally, appropriate respiratory protection and ventilation must be utilized during disturbance of silica-containing structures. The aforementioned recommendations and precautions should be adhered to during the renovation of the building.

It is recommended that the Ontario Ministry of Labour’s Guideline “Silica on Construction Projects”, April, 2011, be referred to when dealing with silica containing materials.
3.5 Other Designated Substance

Based on field observations and on-site activities, there is no reason to believe 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, isocyanates, arsenic, ethylene oxide, benzene or acrylonitrile.

3.6 PCB-Containing Equipment

Row Houses

Fluorescent lighting was not commonly observed within the residential units and as such, PCB-bearing fluorescent light ballasts are not anticipated.

Transformers were not observed nor are commonly associated with individual owner residential units as is the case with the row houses.

Apartment building

A single fluorescent light ballast would be associated with the fluorescent lighting in the laundry room. Based on the age of the building, there is the potential that it contains PCB-bearing ballasts.

No transformers were observed within the buildings.

Recreational Building

There are no fluorescent light ballasts and / or transformers within the recreational building (note that the main board room was not accessed).

Recommendations: The handling and removal of any PCB-containing equipment, including storage, should be conducted as specified in Federal Regulations SOR/2008-273 and Ontario Regulation 362.

The fluorescent light ballasts are to be removed prior to building demolition and be stockpiled and assessed for PCB content by comparing the coding on the surface of each ballast with the Environment Canada publication EPS 2/CC/2 entitled “Identification of Lamp Ballasts Containing PCBs”, revised August 1991. Ballasts that are found to be PCB-containing should be separated from non-PCB-containing ballasts and then taken to a licensed PCB destruction facility.

Disposal of PCB-containing equipment must be conducted in accordance with Ontario Regulations 362 and 347.

3.7 Ozone-Depleting Substances

Row Houses, Apartment Buildings and Recreational Building

Refrigeration within the complex is limited to individually owned refrigerators and individual window-mounted air-conditioning units. The specific refrigerant within these individually owned refrigeration systems cannot be individually verified but may contain ozone-depleting substances.

Recommendations: All sources of ODS should be removed from the building and reused/recycled or disposed prior to the dismantling of the refrigeration system when disturbed as part of on-going building maintenance. In accordance with O.Reg. 189/94, any removal and disposal of refrigeration equipment should only be undertaken by individuals who hold ozone depleting prevention cards. Disposal of any refrigeration equipment and/or refrigerant containers is regulated under O.Reg. 189/94 (amended to O.Reg. 238/01).
3.8 Urea-Formaldehyde Foam Insulation

*Row Houses, Apartment Buildings and Recreational Building*

No suspected urea-formaldehyde foam insulation or areas where the material would have been injected were identified during the site visit. No evidence of injection holes were observed during the survey.

*Recommendations:* There are no recommendations regarding UFFI.

3.9 Bird and Animal Droppings

*Row Houses, Apartment Buildings and Recreational Building*

No evidence of bird and/or animal droppings were observed during the survey. The building was in good housekeeping.

*Recommendations:* There are no recommendations at this time.

3.10 Visible Mould

*Row Houses, Apartment Buildings and Recreational Building*

No widespread indication of mould was observed during the building survey within the areas accessed.

*Recommendations:* In the event that mould is encountered during the asbestos, it is recommended that any visibly mouldy materials be cleaned and/or removed concurrently in accordance with the Environmental Abatement Council of Ontario’s *Mould Abatement Guidelines*, April 2010.
4 General Limitations

The services performed and outlined herein were based in part upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site that were unavailable for direct observation by objects or coverings at the time of our observations.

Any of our observations relating to designated substances at the site are described in this report. Where testing was performed, it was executed in accordance with our contract for these services. It should be noted that other compounds or materials not tested for might be present in the building.

The objective of this report was to survey the environmental conditions at the site within the context of our contract with respect to the existing regulations within the applicable jurisdiction. Compliance of past and current owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.

The conclusions of this report are based, in part, on the information provided by others and any testing and analyses described in the report. The possibility remains that unexpected environmental conditions may be encountered at the site locations not explored. Should such an even occur, exp should be notified in order that we may determine if modifications to our conclusions are necessary.

This report has been prepared in accordance with generally accepted environmental study and/or engineering practices. No other warranties, expressed or implied, are made as to the professional service provided under the terms of our contract and included in this report.

We trust this report is satisfactory for your purposes. If you have any questions regarding our submission, please do not hesitate to contact this office.
Appendix A – Figures
Appendix B – Site Photographs
Photograph No. 1
Example of apartment building complex

Photograph No. 2
Example of row house block with pebble dash at one end of exterior finish
Photograph No. 3
Another row house block with vinyl siding at end

Photograph No. 4
Example of apartment hallways
Photograph No. 5
Example of apartment stairwell

Photograph No. 6
Commonly observed asbestos-containing stipple
Photograph No. 7
Interior of mercury thermostat

Photograph No. 8
Original floor tile in row houses (potentially asbestos); not sampled as they are present in interior of units
Photograph No. 9

Commonly observed asbestos-containing brown caulking / adhesive
Appendix C – Summary Tables
<table>
<thead>
<tr>
<th>Building Section</th>
<th>Room</th>
<th>Area</th>
<th>Paint Type</th>
<th>Paint Colour</th>
<th>Paint Condition</th>
<th>Paint Lead</th>
<th>Potential Asbestos-Containing Material</th>
<th>Potential Lead Paint</th>
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<td>Stippled Drywall Filler Compound F</td>
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</table>

**Legend:**
- 00 0 0 0 0: No asbestos or lead detected
- ND: Non-detect (asbestos not detected)
- n/s: Material not sampled or submitted
- non-asbestos: Sampled material determined homogeneous with identified non-asbestos containing material
- ASBESTOS: Sampled material determined homogeneous with identified asbestos containing material
- non-lead: Sampled material determined homogeneous with identified non-lead based paint
-Lead: Sampled material exceeds or same paint colour exceeds criteria
-potential lead: Sample method detection level exceeds the criteria but not confirmed to exceed lead
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<th>Stairwell</th>
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<th>Asbestos Sample Description</th>
<th>Lead Paint</th>
<th>Mercury</th>
<th>PCB Potential</th>
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<td>Locker Room</td>
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n/s = material not sampled or submitted
ND = non-detect (asbestos not detected)
non-asbestos = sampled material determined homogeneous with identified non-asbestos containing material
shaded = exceedance of criteria
ASBESTOS = sampled material determined homogeneous with identified asbestos containing material

Lead non-lead = sampled material determined homogeneous with identified non-lead based paint
potential lead = sample method detection level exceeds the criteria but not confirmed as second level
## General Building Construction

### Walls, Floor, Ceiling, Asbestos Sample Description

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</table>

### Notes

- ND = non-detect (asbestos not detected)
- non-asbestos = sampled material determined homogeneous with identified non-asbestos containing material
- ASBESTOS = sample method determined homogeneous with identified asbestos containing material
- non-lead = sample method determined homogeneous with identified non-lead based paint
- shaded = exceedance of criteria
- n/s = material not sampled or submitted
### Building Section: UNIT 914B

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<th>Potential Asbestos-Containing Materials</th>
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</table>

- **Walls**
  - Asbestos, composition: Drywall, ceiling: Drywall, drywall filler compound - installed by owner, not assessed.
  - Non-original materials - finished by owner.
  - Surface: Drywall, composition: Unfinished, drywall filler compound - installed by owner.
  - Non-original materials - finished by owner.
  - Master closet: Drywall, wall: Drywall, drywall filler compound - installed by owner.
  - Non-original materials - finished by owner.
  - Attic: Organic on fibreglass.

- **Floor**
  - Furnace: Ceramic, stippled plaster, drywall filler compound - installed by owner.
  - Den painted wood, laminate, drywall filler compound - installed by owner.
  - Basement stairs: Drywall, hardwood, drywall filler compound.
  - Stippled ceiling plaster coat - F 914B-AS1a, assume asbestos good.
  - Stippled ceiling plaster coat - F 914B-AS2a, 5% C, good.

- **Ceiling**
  - 1st Floor living room: Painted drywall, hardwood, stippled plaster, drywall filler compound - F asbestos good.
  - Stippled ceiling plaster coat - F asbestos good.
  - Kitchen: Painted drywall, ceramic, stippled plaster, drywall filler compound - F asbestos good.
  - Stippled ceiling plaster coat - F asbestos good.
  - Dining: Painted drywall, ceramic, stippled plaster, drywall filler compound - F asbestos good.
  - Stippled ceiling plaster coat - F asbestos good.
  - Front hall/entry: Painted drywall, ceramic, stippled plaster, drywall filler compound - F 914B-AS1b, 2% C, good.
  - Stippled ceiling plaster coat - F 914B-AS2b, 5% C, good.
  - Stairwell: Ceramic, stippled plaster, drywall filler compound - F asbestos good.
  - Stippled ceiling plaster coat - F asbestos good.
  - 2nd Floor landing: Painted drywall, hardwood, stippled plaster, drywall filler compound - F 914B-AS1c, 3% C, good.
  - Stippled ceiling plaster coat - F 914B-AS2c, 5% C, good.
  - Rear bedroom 1: Painted drywall, hardwood, stippled plaster, drywall filler compound - F asbestos good.
  - Stippled ceiling plaster coat - F asbestos good.
  - Rear bedroom 2: Painted drywall, hardwood, stippled plaster, drywall filler compound - F asbestos good.
  - Stippled ceiling plaster coat - F asbestos good.
  - Front bedroom 1: Painted drywall, hardwood, stippled plaster, drywall filler compound - F asbestos good.
  - Stippled ceiling plaster coat - F asbestos good.
  - Front bedroom 2: Painted drywall, hardwood, stippled plaster, drywall filler compound - F asbestos good.
  - Stippled ceiling plaster coat - F asbestos good.
  - Bathroom: Painted drywall, ceramic, painted drywall, drywall filler compound - F asbestos good.

- **Notes:**
  - Mercury: Thermostats appeared to be electrical. No Mercury.
  - Fluorescent lighting is not common. The potential for some lights to be compact fluorescent. Significant mercury vapours not anticipated.
  - PCBs: No transformers present.
  - ODS: No radon present.
  - Mould: None identified.
  - Non-lead: Sampled material determined homogeneous with identified non-lead based paint.
  - Lead: Sampled material exceeds or same paint colour exceeds criteria.
  - Potential lead: Sampled method detection level exceeds the criteria but not confirmed to exceed lead.
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<th>Laboratory Result</th>
<th>Condition</th>
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<td>Vinyl floor tile (original)</td>
</tr>
<tr>
<td></td>
<td>Rear bedroom 2</td>
<td>Painted drywall</td>
<td>Vinyl floor tile (original)</td>
</tr>
<tr>
<td></td>
<td>Front bedroom</td>
<td>Painted drywall</td>
<td>Carpet</td>
</tr>
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<td>Bathroom</td>
<td>Painted drywall</td>
<td>Floor tiles</td>
</tr>
<tr>
<td></td>
<td>Attic</td>
<td>Organic on fiberglass</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- Mercury: Thermometers potentially mercury containing.
- Fluorescent lighting is not common. The potential for some lights to be compact fluorescent. Significant mercury vapours not anticipated.
- PCB: No transformers present
- No old fluorescent light ballasts
- ODS: Standard refrigerator in kitchen
- Lead: None identified
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- ND = non-detected (asbestos not detected)
- non-asbestos = sampled material determined homogeneous with identified non-asbestos containing material
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- ASBESTOS = sampled material determined homogeneous with identified asbestos containing material
- non-lead = sampled material determined homogeneous with identified non-lead based paint
- Lead = sampled material exceeds or same paint colour exceeds criteria
<table>
<thead>
<tr>
<th>Building Section</th>
<th>Room Number</th>
<th>Room Description</th>
<th>Location</th>
<th>Sample Material</th>
<th>Sample Number</th>
<th>Result Condition</th>
<th>Lead</th>
<th>Mercury</th>
<th>PCB</th>
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<tr>
<td>Basement</td>
<td>1</td>
<td>front stairwell landing</td>
<td>painted stippled drywall walls</td>
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<td>stippled drywall filler compound</td>
<td>F 898-AS1b</td>
<td>3% C</td>
<td>good</td>
<td>stark white ceiling paint</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>rear stairwell landing</td>
<td>painted stippled drywall walls</td>
<td>vinyl composite tiles</td>
<td>stippled drywall filler compound</td>
<td>F 898-AS-1c</td>
<td>2% C</td>
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<td>stark white ceiling paint</td>
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<tr>
<td></td>
<td>3</td>
<td>laundry room - no access</td>
<td>garbage room - painted masonry block</td>
<td>painted concrete</td>
<td>painted concrete</td>
<td>stark white wall and ceiling paint</td>
<td>good</td>
<td>red floor paint</td>
<td>n/s</td>
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<tr>
<td></td>
<td>4</td>
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<td>central hallway</td>
<td>painted stippled drywall walls</td>
<td>carpet</td>
<td>stippled drywall filler compound</td>
<td>F asbestos</td>
<td>good</td>
<td>stark white ceiling paint</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>unit 1 - no access</td>
<td>unit 2 - no access</td>
<td>unit 3 - no access</td>
<td>bicycle storage - no access</td>
<td>unit 4 - no access</td>
<td>unit 5 - no access</td>
<td>unit 6 - no access</td>
<td>unit 7 - no access</td>
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<td>stippled drywall filler compound</td>
<td>F asbestos</td>
<td>good</td>
<td>stark white ceiling paint</td>
<td>0</td>
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<td>stippled drywall filler compound</td>
<td>F asbestos</td>
<td>good</td>
<td>stark white ceiling paint</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>central hallway</td>
<td>painted stippled drywall walls</td>
<td>carpet</td>
<td>stippled drywall filler compound</td>
<td>F asbestos</td>
<td>good</td>
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<td>F asbestos</td>
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<td></td>
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<td>painted stippled drywall walls</td>
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<td>stippled drywall filler compound</td>
<td>F asbestos</td>
<td>good</td>
<td>stark white ceiling paint</td>
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<td>carpet</td>
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<td>F asbestos</td>
<td>good</td>
<td>stark white ceiling paint</td>
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<td>painted stippled drywall walls</td>
<td>carpet</td>
<td>stippled drywall filler compound</td>
<td>F asbestos</td>
<td>good</td>
<td>stark white ceiling paint</td>
<td>0</td>
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<td>Concrete</td>
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<td>dark brown</td>
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<td>white</td>
<td>n/a</td>
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</tr>
</tbody>
</table>

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potential lead = sample method detection level exceeds the criteria but not confirmed to exceed lead
<table>
<thead>
<tr>
<th>Section</th>
<th>Room Number</th>
<th>General Building Construction</th>
<th>Potential Asbestos-Containing Materials</th>
<th>Potential Lead Paint</th>
<th>Mercury</th>
<th>PCB</th>
<th>ODS</th>
<th>Other</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Walls</td>
<td>Floor</td>
<td>Ceiling</td>
<td>Asbestos Sample Description</td>
<td>Friability</td>
<td>Sample Number</td>
<td>Laboratory Result</td>
</tr>
<tr>
<td>Lower level</td>
<td>Main hallway landing</td>
<td>Drywall</td>
<td>vinyl composite tile</td>
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<td>drywall filler compound</td>
<td>F</td>
<td>55-AM,b,c</td>
<td>2 - 5 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td>stippled ceiling plaster coat</td>
<td>F</td>
<td>55-AM,b,c</td>
<td>3 - 5 %</td>
<td>damaged</td>
<td>stark white wall paint</td>
<td>55-LS2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Men's washroom</td>
<td>painted stippled drywall walls</td>
<td>Drywall</td>
<td>drywall filler compound</td>
<td>F</td>
<td>55-AM,b,c</td>
<td>2 - 5 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td>stippled ceiling plaster coat</td>
<td>F</td>
<td>55-AM,b,c</td>
<td>3 - 5 %</td>
<td>damaged</td>
<td>stark white wall paint</td>
<td>55-LS2</td>
</tr>
<tr>
<td></td>
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<td>Ladies washroom</td>
<td>painted stippled drywall walls</td>
<td>Drywall</td>
<td>drywall filler compound</td>
<td>F</td>
<td>55-AM,b,c</td>
<td>2 - 5 %</td>
</tr>
<tr>
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<td></td>
<td>stippled ceiling plaster coat</td>
<td>F</td>
<td>55-AM,b,c</td>
<td>3 - 5 %</td>
<td>damaged</td>
<td>stark white wall paint</td>
<td>55-LS2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boardroom</td>
<td>no access</td>
<td>Drywall</td>
<td>drywall filler compound</td>
<td>F</td>
<td>55-AM,b,c</td>
<td>2 - 5 %</td>
</tr>
<tr>
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<td></td>
<td>Upper level</td>
<td>Function room</td>
<td>Drywall</td>
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<td>stippled</td>
<td>drywall filler compound</td>
<td>F</td>
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<tr>
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<td></td>
<td>stippled ceiling plaster coat</td>
<td>F</td>
<td>55-AM,b,c</td>
<td>3 - 5 %</td>
<td>damaged</td>
<td>stark white wall paint</td>
<td>55-LS2</td>
</tr>
<tr>
<td></td>
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<td>Drywall</td>
<td>metal composite tile</td>
<td>stippled</td>
<td>drywall filler compound</td>
<td>F</td>
<td>55-AM,b,c</td>
</tr>
<tr>
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<td>F</td>
<td>55-AM,b,c</td>
<td>3 - 5 %</td>
<td>damaged</td>
<td>stark white wall paint</td>
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<td></td>
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<td>brick</td>
<td>Shingled</td>
<td>window caulking</td>
<td>NF</td>
<td>55-AM,b,c</td>
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<td>NF</td>
<td>55-AM,b,c</td>
<td>non-detect</td>
<td>good</td>
<td>Red wood panel paint</td>
</tr>
</tbody>
</table>

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<tr>
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<th>Room Number</th>
<th>General Building Construction</th>
<th>Potential Asbestos-Containing Materials</th>
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<th>Mercury</th>
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<th>ODS</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Walls</td>
<td>Floor</td>
<td>Ceiling</td>
<td>Asbestos Sample Description</td>
<td>Friability</td>
<td>Sample Number</td>
<td>Laboratory Result</td>
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<thead>
<tr>
<th>Building Section</th>
<th>Room Number</th>
<th>General Building Construction</th>
<th>Asbestos Sample Description</th>
<th>Sample Number</th>
<th>Laboratory Results</th>
<th>Condition</th>
<th>Colour</th>
<th>Analysis Results</th>
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<td>Suspended acoustic ceiling tile</td>
<td>Asbestos filler compound</td>
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<td>ND (finished by owner)</td>
<td>good</td>
<td>Not Assessed</td>
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<tr>
<td>Washroom</td>
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<td>Vinyl sheet</td>
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<td>902H-AS-2a</td>
<td>ND</td>
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<tr>
<td>Den</td>
<td>Finished drywall</td>
<td>Suspended ceiling</td>
<td>Asbestos filler compound</td>
<td>P</td>
<td>Finished by owner</td>
<td>good</td>
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<td>Stairwell steps</td>
<td>Painted drywall</td>
<td>Suspended ceiling</td>
<td>Asbestos filler compound</td>
<td>B</td>
<td>902H-AS-2b</td>
<td>ND</td>
<td>good</td>
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<td>1st Floor living room</td>
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<td>Asbestos filler compound</td>
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<td>ND</td>
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<td>Ceramic tile</td>
<td>Stippled plaster</td>
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<td>Front hall/entry</td>
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<td>F</td>
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<td>Hardwood</td>
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<td>2nd Floor landing</td>
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<td>Bedroom 1</td>
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<td>ND</td>
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<tr>
<td>Attic blow</td>
<td>Organic</td>
<td>Suspended ceiling</td>
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<td>902H-AS-3a</td>
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<td>Exterior brick (1st floor)</td>
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<td>Gypsum plaster</td>
<td>Asbestos filler compound</td>
<td>P</td>
<td>902H-AS-3b</td>
<td>3% C</td>
<td>good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt shingle (2nd floor)</td>
<td>Parged white</td>
<td>Gypsum plaster</td>
<td>Asbestos filler compound</td>
<td>P</td>
<td>902H-AS-3c</td>
<td>3% C</td>
<td>good</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- Mercury: Thermometers appeared to be electrical. No Mercury.
- Fluorescent lighting is not common. The potential for some lights to be compact fluorescent. Significant mercury vapours not anticipated.
- PCB: No transformers present.
- ODS: No old fluorescent light fixtures.
- Lead: Standard refrigerator in kitchen.
- Mold: None identified.

Legend:
- ND = material not sampled or submitted
- N/S = non-detected (material not sampled)
- ND = non-detected (material not sampled)
- Non-asbestos = sample method detection level exceeds criteria but not confirmed to exceed lead
- Asbestos = sample method detection level exceeds criteria and confirmed to exceed lead
- Lead = sample method detection level exceeds criteria and confirmed to exceed lead
<table>
<thead>
<tr>
<th>Building Section</th>
<th>Room Number</th>
<th>General Building Construction</th>
<th>Potential Asbestos-Containing Materials</th>
<th>Lead Paint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Walls</td>
<td>Floor</td>
<td>Ceiling</td>
</tr>
<tr>
<td>Residues</td>
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</tbody>
</table>

**Notes:**
- **Mercury:** Thermostats appeared to be electrical. No Mercury.
- **Fluorescent lighting is not common. The potential for some lights to be compact fluorescent.** Significant mercury vapours not anticipated.
- **PCB:** No transformers present.
- **ODS:** No old fluorescent light ballasts.
- **Mould:** None identified.
- **Non-lead =** Sampled material determined homogeneous with identified non-lead-based paint.
- **Potential lead =** Sample method detection level exceeds the criteria but not confirmed to exceed lead.
- **Selected material determined homogeneous with identified asbestos containing material.**
<table>
<thead>
<tr>
<th>Section</th>
<th>Room Number</th>
<th>Paint Type</th>
<th>Sample Description</th>
<th>Paint Colour</th>
<th>Paint Condition</th>
<th>Potential Asbestos-Containing Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Floor</td>
<td>900-AS-2a</td>
<td>Stirred ceiling plaster coat F</td>
<td>5% C</td>
<td>damaged off-white wall paint</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
<tr>
<td>1st Floor</td>
<td>900-LS-3</td>
<td>Stippled ceiling plaster coat F</td>
<td>ND</td>
<td>36&quot; x 36&quot; VCT, beige with brown flecks</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>1st Floor</td>
<td>900-AS-2b</td>
<td>Stirred ceiling plaster coat F</td>
<td>4% C</td>
<td>off-white wall paint</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
<tr>
<td>1st Floor</td>
<td>900-AS-3a</td>
<td>Stirred ceiling plaster coat F</td>
<td>1% C</td>
<td>36&quot; x 36&quot; VCT, beige with brown flecks</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>1st Floor</td>
<td>900-LS-2</td>
<td>Stirred ceiling plaster coat F</td>
<td>&lt;24.68</td>
<td>Non-asbestos</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>2nd Floor</td>
<td>900-AS-1b</td>
<td>Stirred ceiling plaster coat F</td>
<td>2% C</td>
<td>stark white ceiling paint</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
<tr>
<td>2nd Floor</td>
<td>900-AS-2c</td>
<td>Stirred ceiling plaster coat F</td>
<td>4% C</td>
<td>beige trim paint</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
<tr>
<td>2nd Floor</td>
<td>900-AS-3c</td>
<td>Stirred ceiling plaster coat F</td>
<td>ND</td>
<td>36&quot; x 36&quot; VCT, beige with brown flecks</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>2nd Floor</td>
<td>900-LS-1</td>
<td>Stirred ceiling plaster coat F</td>
<td>ND</td>
<td>beige trim paint</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>2nd Floor</td>
<td>900-LS-3</td>
<td>Stirred ceiling plaster coat F</td>
<td>ND</td>
<td>36&quot; x 36&quot; VCT, beige with brown flecks</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>2nd Floor</td>
<td>900-AS-1c</td>
<td>Stirred ceiling plaster coat F</td>
<td>1% C</td>
<td>stark white ceiling paint</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
<tr>
<td>2nd Floor</td>
<td>900-AS-3d</td>
<td>Stirred ceiling plaster coat F</td>
<td>3% C</td>
<td>36&quot; x 36&quot; VCT, beige with brown flecks</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>3rd Floor</td>
<td>900-AS-1d</td>
<td>Stirred ceiling plaster coat F</td>
<td>1% C</td>
<td>stark white ceiling paint</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
<tr>
<td>3rd Floor</td>
<td>900-LS-1</td>
<td>Stirred ceiling plaster coat F</td>
<td>ND</td>
<td>beige trim paint</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>3rd Floor</td>
<td>900-LS-2</td>
<td>Stirred ceiling plaster coat F</td>
<td>ND</td>
<td>36&quot; x 36&quot; VCT, beige with brown flecks</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>3rd Floor</td>
<td>900-LS-3</td>
<td>Stirred ceiling plaster coat F</td>
<td>ND</td>
<td>beige trim paint</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>3rd Floor</td>
<td>900-LS-4</td>
<td>Stirred ceiling plaster coat F</td>
<td>ND</td>
<td>36&quot; x 36&quot; VCT, beige with brown flecks</td>
<td>Good</td>
<td>Asbestos</td>
</tr>
<tr>
<td>Exterior</td>
<td>900-AS-4a</td>
<td>Exterior brick and siding</td>
<td>ND</td>
<td>concrete flat</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
<tr>
<td>Exterior</td>
<td>900-AS-4b</td>
<td>Exterior brick and siding</td>
<td>ND</td>
<td>flat dark brown door/window caulking</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
<tr>
<td>Exterior</td>
<td>900-AS-4c</td>
<td>Exterior brick and siding</td>
<td>ND</td>
<td>Exterior brick and siding</td>
<td>Good</td>
<td>Non asbestos</td>
</tr>
</tbody>
</table>

Notes:
- Potential Lead Paint:
  - Results are forpaint samples taken at a depth of at least 0.01".
  - Significant lead may be present in locations where the paint is worn, scuffed, or otherwise damaged.
  - The presence of lead-based paint is determined by the method of detection.

- Potential Asbestos-Containing Material:
  - Results are for materials that were sampled and tested.
  - Asbestos is not detected (ND).
  - Asbestos is detected, but not confirmed to exceed lead (potential lead).
  - Asbestos is detected and confirmed to exceed lead (lead).
<table>
<thead>
<tr>
<th>Building Section</th>
<th>Room Number</th>
<th>Walls</th>
<th>Floor</th>
<th>Ceiling</th>
<th>Asbestos Sample Description</th>
<th>Friability (F/NF)</th>
<th>Sample Number</th>
<th>Laboratory Result</th>
<th>Condition</th>
<th>Paint Colour</th>
<th>Sample</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement</td>
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<td>Laundry</td>
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<tr>
<td>Suspended acoustic ceilings</td>
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<tr>
<td>Drywall filler compound</td>
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<tr>
<td>Finished (finished by owner) (tenant installed)</td>
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<td>Suspended acoustic ceilings</td>
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<td>Drywall filler compound</td>
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<tr>
<td>Asbestos</td>
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</tbody>
</table>

| 1st Floor | | | | | | | | | | | | |
| Living room | | | | | | | | | | | | |
| Painted drywall | | | | | | | | | | | | |
| Hardwood | | | | | | | | | | | | |
| Stippled plaster | | | | | | | | | | | | |
| Drywall filler compound | | | | | | | | | | | | |
| Asbestos | | | | | | | | | | | | |
| Stippled ceiling | | | | | | | | | | | | |
| Plaster coat | | | | | | | | | | | | |

| 2nd Floor | | | | | | | | | | | | |
| Landing | | | | | | | | | | | | |
| Painted drywall | | | | | | | | | | | | |
| Hardwood | | | | | | | | | | | | |
| Stippled plaster | | | | | | | | | | | | |
| Drywall filler compound | | | | | | | | | | | | |
| Asbestos | | | | | | | | | | | | |
| Stippled ceiling | | | | | | | | | | | | |
| Plaster coat | | | | | | | | | | | | |

| Attic | | | | | | | | | | | | |
| No access | | | | | | | | | | | | |

Notes:
- Mercury
- Thermometers appeared to be electrical. No Mercury.
- Fluorescent lighting is not common. The potential for some lights to be compact fluorescent. Significant mercury vapours not anticipated.
- PCB
- No transformers present
- No fluorescent light ballasts
- ODS
- Standard refrigerator in kitchen
- Mixed
- Notes identified
- Non-identified
- N/A = material not sampled or submitted
- ND = non-detected (asbestos not detected)
- non-asbestos = sampled material determined homogeneous with identified non-asbestos containing material
- Asbestos = sampled material determined homogeneous with identified asbestos containing material
- Non-lead = sampled material exceeds or same paint colour exceeds criteria
- Lead = sampled material exceeds or same paint colour exceeds criteria
- Potential lead = sample method detection level exceeds the criteria but not confirmed to exceed lead.
<table>
<thead>
<tr>
<th>Room Number</th>
<th>Walls</th>
<th>Floor</th>
<th>Ceiling</th>
<th>Asbestos Sample Description</th>
<th>Sample Number</th>
<th>Laboratory Result</th>
<th>Condition</th>
<th>Paint Colour</th>
<th>Lead Result</th>
<th>Condition</th>
<th>Potential Lead Paint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Floor living room</td>
<td>painted drywall</td>
<td>carpet</td>
<td>stippled plaster</td>
<td>stippled ceiling plaster coat</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td>stippled coating</td>
<td>3 µg/g</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>1st Floor dining</td>
<td>painted drywall</td>
<td>carpet</td>
<td>stippled plaster</td>
<td>stippled ceiling plaster coat</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td>stippled coating</td>
<td>3 µg/g</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>1st Floor kitchen</td>
<td>painted drywall</td>
<td>ceramic</td>
<td>stippled plaster</td>
<td>stippled ceiling plaster coat</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td>stippled coating</td>
<td>3 µg/g</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>1st Floor front hall</td>
<td>painted drywall</td>
<td>carpet</td>
<td>stippled plaster</td>
<td>stippled ceiling plaster coat</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td>stippled coating</td>
<td>3 µg/g</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>2nd Floor landing</td>
<td>painted drywall</td>
<td>carpet</td>
<td>stippled plaster</td>
<td>stippled ceiling plaster coat</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td>stippled coating</td>
<td>3 µg/g</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>2nd Floor rear bedroom 1</td>
<td>painted drywall</td>
<td>carpet</td>
<td>stippled plaster</td>
<td>stippled ceiling plaster coat</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td>stippled coating</td>
<td>3 µg/g</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>2nd Floor rear bedroom 2</td>
<td>painted drywall</td>
<td>carpet</td>
<td>stippled plaster</td>
<td>stippled ceiling plaster coat</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td>stippled coating</td>
<td>3 µg/g</td>
<td>good</td>
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</tr>
<tr>
<td>2nd Floor front bedroom</td>
<td>painted drywall</td>
<td>carpet</td>
<td>textured plaster</td>
<td>stippled ceiling plaster coat</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td>stippled coating</td>
<td>3 µg/g</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>2nd Floor bathroom</td>
<td>painted drywall</td>
<td>vinyl sheet</td>
<td>painted drywall</td>
<td>drywall filler compound</td>
<td>F asbestos</td>
<td>good</td>
<td>Not Assessed</td>
<td></td>
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</tr>
<tr>
<td>Attic</td>
<td>Exterior siding</td>
<td>concrete</td>
<td>fdn shingled roof</td>
<td>white caulking</td>
<td>ND</td>
<td>n/s</td>
<td>soft</td>
<td></td>
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</tr>
<tr>
<td>Mercury: Thermometers appeared to be electrical. No Mercury.</td>
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</tr>
<tr>
<td>Fluorescent lighting is not common. The potential for some lights to be compact fluorescent. Significant mercury vapours not anticipated.</td>
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<tr>
<td>PCB: No PCBs detected.</td>
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<tr>
<td>OCS: Standard refrigerator in kitchen</td>
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<tr>
<td>Mold: None identified</td>
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</tr>
<tr>
<td>Non-Lead: sample method detection level exceeds the criteria but not confirmed to exceed lead</td>
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</tr>
</tbody>
</table>

Potential Lead Paint:
- potential lead = sample method detection level exceeds the criteria but not confirmed to exceed lead
- lead = sample material exceeds or paint colour exceeds criteria
- non-lead = sample material determined homogeneous with identified non-lead based paint
- non-asbestos = sampled material determined homogeneous with identified non-asbestos containing material
- shaded = exceedance of criteria
- ASBESTOS = sampled material determined homogeneous with identified asbestos containing material
- nd = non-detect (asbestos not detected)
- n/s = material not sampled or submitted
- standard = sample material determined homogeneous with identified standard containing material
- non-asbestos = sampled material determined homogeneous with identified non-asbestos containing material
- installer manufactured criteria
- lead = sample material exceeds or paint colour exceeds criteria
- non-lead = sample material determined homogeneous with identified non-lead based paint
- potential lead = sample method detection level exceeds the criteria but not confirmed to exceed lead
<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Room Number</th>
<th>Walls</th>
<th>Floor</th>
<th>Ceiling</th>
<th>Asbestos Sample Description</th>
<th>Lead Result</th>
<th>Non-lead Paint (µg/g)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT 910A</td>
<td>Laundry</td>
<td>painted drywall</td>
<td>hardwood</td>
<td>Asbestos filler compound</td>
<td>F</td>
<td>good</td>
<td>Not assessed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Washroom</td>
<td>painted drywall</td>
<td>hardwood</td>
<td>Asbestos filler compound</td>
<td>F</td>
<td>good</td>
<td></td>
<td></td>
</tr>
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**Notes:**
- **Mercury:** Thermostats appeared to be electrical. No Mercury.
- **Fluorescent lighting is not common. The potential for some lights to be compact fluorescent. Significant mercury vapours not anticipated.**
- **PCB:** No transformers present. No old fluorescent light ballasts.
- **ODS:** Mould. None identified.

**Non-lead Paint**
- **n/s** = material not sampled or submitted
- **ND** = non-lead (paints not detected)
- **non-lead** = sampled material determined homogeneous with identified non-lead paint
- **Asbestos** = sampled material determined homogeneous with identified asbestos containing material
- **Lead** = sampled material exceeds or same paint colour exceeds criteria
- **potential lead** = sample method detection level exceeds the criteria but not confirmed to exceed lead
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Notes:
- Mercury
- Thermostats appeared to be electrical. No Mercury.
- Fluorescent lighting is not common. The potential for some lights to be compact fluorescent. Significant mercury vapours not anticipated.
- PCB
- No transformers present
- No old fluorescent light ballasts
- ODS
- Standard refrigerator in kitchen
- Mould
- None identified
- Non-asbestos = sampled material determined homogeneous with identified non-asbestos containing material
- Potential = sample method detection level exceeds the criteria but not confirmed to exceed lead

Potential Lead Paint Criteria:
- Lead = sample material exceeds or same paint colour exceeds criteria
- Potential Lead = sample method detection level exceeds the criteria but not confirmed to exceed lead
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Notes:

**Mercury**

Thermometers appeared to be electrical. No Mercury.

Fluorescent lighting is not common. The potential for some lights to be compact fluorescent. Significant mercury vapours not anticipated.

**PCB**

No transformers present

No old fluorescent light ballasts

**ODS**

Standard refrigerator in kitchen

Mould

None identified

**n/a = material not sampled or submitted**

**ND = non-detect (asbestos not detected)**

**same = sample determined homogeneous with identified asbestos containing material**

**non-lead = sampled material determined homogeneous with identified non-asbestos containing material**

**non-leaded = sampled material determined homogeneous with identified non-lead based paint**

**potential lead = sample method detection level exceeds the criteria but not confirmed to exceed lead**
<table>
<thead>
<tr>
<th>Building Section</th>
<th>Room Number</th>
<th>General Building Construction</th>
<th>Potential Asbestos-Containing Materials</th>
<th>Potential Lead Paint</th>
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<tbody>
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<td></td>
<td></td>
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<td>Floor</td>
<td>Ceiling</td>
</tr>
<tr>
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<td>concrete</td>
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<td></td>
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<td>acoustic tile - tenant</td>
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<td>painted drywall</td>
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<td>painted drywall</td>
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<tr>
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<td>main hallway</td>
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<td>rear bedroom 1</td>
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<td>Standard refrigerator in kitchen</td>
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<tr>
<td>Mould</td>
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</tr>
<tr>
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<td>------------------</td>
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<td>Condition</td>
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<tr>
<td>Paint Colour</td>
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</tr>
<tr>
<td>Sample</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Appendix D –
Laboratory Certificates of Analysis
Materials Characterization - Bulk Asbestos Analysis

Laboratory Analysis Report - Polarized Light

exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6

CA Labs
12232 Industriplex, Suite 32
Baton Rouge, LA 70809
Phone 225-751-5632
Fax 225-751-5634

Analysis and Method

Summary of polarizing light microscopy (PLM / Stereomicroscopy bulk asbestos analysis) using the methods described in 40CFR Part 763 Appendix E to Subpart E (Interim and EPA 600 / R-93 / 116 (Improved). The sample is first viewed with the aid of stereomicroscopy. Numerous liquid slide preparations are created for analysis under the polarized microscope where identifications and quantifications are performed. Calibrated liquid refractive oils are used as liquid mounting medium. These oils are used for identification (dispersion staining). A calibrated visual estimation is reported, should any asbestiform mineral be present. Other techniques such as acid washing are used in conjunction with refractive oils for detection of smaller quantities of asbestos. All asbestos percentages are based on calibrated visual estimation traceable to NIST standards for regulated of asbestos. Traceability to measurement and calibration is achieved by using known amounts and types of asbestos from standards where analyst and laboratory accuracy are measured. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 0.50% (well above the laboratory definition of trace).

Discussion

Vermiculite containing samples may have trace amounts of actinolite-tremolite, where not found be PLM should be analyzed using TEM methods and / or water separation techniques. Suspected actinolite/vermiculite presence will be indicated through the sample comment section of this report.

Fibrous talc containing samples may even contain a related asbestos fiber known as anthophyllite. Under certain conditions the same fiber may actually contain both talc and anthophyllite (a phenomenon called intergrowth). Again, TEM detection methods are recommended. CA Labs PLM report comments will denote suspected amounts of asbestiform anthophyllite with talc, where further analysis is recommended.

Some samples (floor tiles, surfacings, etc.) may contain fibers too small to be detectable by PLM analysis and should be analyzed by TEM bulk protocols.

A "trace asbestos" will be reported if the analyst observes far less than 1% asbestos. CA Labs defines "trace asbestos" as a few fibers detected by the analyst in several preparations and will indicate as such under these circumstances.

Quantification of <1% will actually be reported as <=1% (allowable variance close to 1% is high). Such results are ideal for point counting, and the technique is mandatory for friable samples (NESHAP, Nov. 1990 and clarification letter 8 May 1991) under 1% percent asbestos and the "trace asbestos". In order to make all initial PLM reports issued from CA Labs NESHAP compliant, all <1% asbestos results (except floor tiles) will be point counted at no additional charge.

Qualifications

CA Labs is accredited by the National Voluntary Accreditation Program (NVLAP) for selected test methods for airborne fiber analysis (TEM), and for bulk asbestos fiber analysis (PLM). All analysts have a college degree in a natural science (geology, biology, or environmental science) or are recognized by a state professional board in one these disciplines. Extensive in-house training programs are used to augment education background of the analyst. The group leader of polarized light has received supplemental McCrone Research training for asbestos identification. This report is not covered by the scope of AIHA accreditation. Analysis performed at CA Labs, LLC 12232 Industriplex, Suite 32 Baton Rouge, LA 70809.

Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM
LDEQ
### Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Customer Project:</th>
<th>CA Labs Project #:</th>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>List of Affected Building Material Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCC6/ OTT-00211242-A0</td>
<td>CBR1303869</td>
<td>49-LS2</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>trace Chrysotile</td>
<td>white surfaced tan compound</td>
</tr>
<tr>
<td></td>
<td></td>
<td>51-LS3</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>trace Chrysotile</td>
<td>tan surfaced tan compound</td>
</tr>
<tr>
<td></td>
<td></td>
<td>898-LS1</td>
<td>1</td>
<td>tan surfaced tan compound</td>
<td>trace Chrysotile</td>
<td>trace Chrysotile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>896-LS1</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>&lt;0.5% Chrysotile</td>
<td>white surfaced tan compound</td>
</tr>
</tbody>
</table>

**Glossary of abbreviations (non-asbestos fibers and non-fibrinous minerals):**

- ca - carbonate
- gypsum - gypsum
- bi - binder
- or - organic
- ma - matrix
- mi - mica
- ve - vermiculite
- ot - other
- po - perlite
- qu - quartz
- fg - fiberglass
- mw - mineral wool
- wo - wollastonite
- ta - talc
- sy - synthetic
- ce - cellulose
- br - brucite
- ka - kaolin (clay)

This report relates to the items tested. This report is not to be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, AHA LAP, LLC, or any other agency of the federal government. This report may not be reproduced except in full without written permission from CA Labs. These results are submitted pursuant to CA Labs’ current terms and sale, condition of sale, including the company’s standard warranty and limitations of liability provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, CA Labs will store the samples for a period of ninety (90) days before discarding. A shipping or handling fee may be assessed for the return of any samples.
### Polarized Light Asbestiform Materials Characterization

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Homogeneity US (Y/N)</th>
<th>Asbestos Type / Calibrated Visual Estimate Percent</th>
<th>Non-asbestos Fiber Type / Percent</th>
<th>Non-fibrous Type / Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>49-LS2</td>
<td></td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>N</td>
<td>trace Chrysotile</td>
<td>100% bi, mi, ca</td>
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<tr>
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<td>white surfaced tan compound</td>
<td>N</td>
<td>trace Chrysotile</td>
<td>100% bi, mi, ca</td>
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<tr>
<td>47-LS1</td>
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<td>1</td>
<td>white surfacing</td>
<td>Y</td>
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<td>100% qu, bi</td>
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<tr>
<td></td>
<td></td>
<td>2</td>
<td>white drywall with paper</td>
<td>N</td>
<td>None Detected</td>
<td>8% ce</td>
<td>92% qu, gy</td>
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<tr>
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<td>tan surfaced tan compound</td>
<td>N</td>
<td>trace Chrysotile</td>
<td>100% bi, mi, ca</td>
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<tr>
<td>896-LS1</td>
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<td>1</td>
<td>white surfaced tan compound</td>
<td>N</td>
<td>&lt; 0.5% Chrysotile</td>
<td>100% bi, mi, ca</td>
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</tbody>
</table>

Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM  
LDEQ  
TDH 30-0370

**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600/R-93/116)  
**Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

---

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers  
2. Fire Damage no significant fiber damages affecting fibrous percentages  
3. Actinolite in association with Vermiculite  
4. Layer not analyzed - attached to previous positive layer and contamination is suspected  
5. Not enough sample to analyze  
6. Anthophydrive in association with Fibrous Talc  
7. Contamination suspected from other building materials  
8. Favorable scenario for water separation on vermiculite for possible analysis by another method  
9. < 1%. Result point counted positive  
10. TEM analysis suggested

---

**Approved Signatories:**  
Alicia Stretz, Senior Analyst  
Chris Williams, Laboratory Director

---

**Alaska Fire Services, Inc.**  
100-2650 Queensview Dr.  
Ottawa, ON K2B 8H6  
**CA Labs, L.L.C.**  
265-OTT-002124-A0  
Date: 3/28/2013  
Date Of Sampling: 3/27/13 3 PM  
Date: 3/27/13 3 PM  
Date Of Sampling: 3/28/2013  
Sample Order #: CCC6/OTT-002124-A0  
Pack Order #: CCC6/OTT-002124-A0  
Turnaround Time: 24 Hour  
Sample Received: N/A  
Purchase Order #: CBR1303869  
**CA Labs, L.L.C.**  
Baton Rouge, LA 70809  
Phone: 225-751-5632  
Fax: 225-751-5634  
**CA Labs**  
1929 Old Denton Road  
Carrollton, TX 75006  
Phone: 972-242-2754  
Fax: 972-242-2798  
**Crisp Analytical, LLC.**  
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Phone: 972-242-2754  
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Polarized Light Asbestiform Materials Point Count
Laboratory Analysis Report - Point Count

Analysis and Method
Point counting was performed on a polarized light microscope with a calibrated reticle according to the revised NESHAP method of November 20, 1990 (Federal Register, V.55, N.224, 11/20/90). Original asbestos content of bulk materials was determined using procedures outlined in the interim method (40 CFR part 763, Appendix E to subpart E) and AHERA method (EPA-600/R-93/116). Samples were prepared using HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion staining / becke line method.

Qualifications
CA Labs is accredited by the National Voluntary Accreditation Program (NVLAP) for selected test methods for airborne fiber analysis (TEM), and for bulk asbestos fiber analysis (PLM). All analysts have a college degree in a natural science (geology, biology, or environmental science) or are recognized by a state professional board in one of these disciplines. Extensive in-house training programs are used to augment education background of the analyst. The group leader of polarized light has received supplemental McCrone Research training for asbestos identification. This report is not covered by the scope of NVLAP or AIHA accreditation. Analysis performed at CA Labs, LLC 12232 Industriplex, Suite 32 Baton Rouge, LA 70809.

Customer Info: Attn: Shawn Doherty
exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6
Phone # 613-688-1899
Fax # 613-225-7337

Customer Project: CA Labs Project #: CCC6/ OTT-00211242-A0 CBR1303869
Date: 3/28/2013
Turnaround Time: 24 Hour
Samples Received: 3/27/13 3 PM
Date Of Sampling: N/A
Purchase Order #: CBR1303869

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Homogeneouis (Y/N)</th>
<th>Point Counted % / Asbestos Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>49-LS2</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>N</td>
<td>trace Chrysotile</td>
</tr>
<tr>
<td>51-LS3</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>N</td>
<td>trace Chrysotile</td>
</tr>
<tr>
<td>898-LS1</td>
<td>1</td>
<td>tan surfaced tan compound</td>
<td>N</td>
<td>trace Chrysotile</td>
</tr>
</tbody>
</table>

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Approved Signatories:

Alicia Stretz
Analyst
Senior Analyst Alicia Stretz
Laboratory Director Chris Williams
Polarized Light Asbestiform Materials Point Count
Laboratory Analysis Report - Point Count

Customer Info: Attn: Shawn Doherty
exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6

Phone #  613-688-1899
Fax #  613-225-7337

Laboratory Director
Chris Williams
Analyst Alicia Stretz

Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM
TDH 30-0370
LDEQ

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Approved Signatories:

Alicia Stretz
Analyst

Senior Analyst
Alicia Stretz

Laboratory Director
Chris Williams
Atomic Absorption Lead Report

Analysis Method: Lead in Paint analyzed by Atomic Absorption (AA)/SW-846-7420;
This analysis is not covered by the scope of accreditation by NVLAP or AIHA.

Sample Prep Method: Samples are dissolved in nitric acid, extracted, and analyzed on a properly calibrated AA; Absorbency curve was calculated, bandwidth corrected, and wavelength at the time of the analysis was measured and recorded.

<table>
<thead>
<tr>
<th>Sample#</th>
<th>Sample Concentration: parts per million (ppm)</th>
<th>Weight Percent:</th>
</tr>
</thead>
<tbody>
<tr>
<td>896-LS-1</td>
<td>423.14</td>
<td>0.0423</td>
</tr>
<tr>
<td>896-LS-2</td>
<td>&lt;86.58</td>
<td>0.0087</td>
</tr>
<tr>
<td>896-LS-3</td>
<td>&lt;73.83</td>
<td>0.0074</td>
</tr>
<tr>
<td>55-LS-1</td>
<td>806.02</td>
<td>0.0806</td>
</tr>
<tr>
<td>55-LS-2</td>
<td>&lt;82.68</td>
<td>&lt;0.0083</td>
</tr>
<tr>
<td>55-LS-3</td>
<td>&lt;56.10</td>
<td>&lt;0.0056</td>
</tr>
<tr>
<td>898-LS-1</td>
<td>827.19</td>
<td>0.0827</td>
</tr>
<tr>
<td>898-LS-2</td>
<td>85.65</td>
<td>0.0086</td>
</tr>
<tr>
<td>898-LS-3</td>
<td>&lt;44.05</td>
<td>&lt;0.0044</td>
</tr>
<tr>
<td>51-LS-1</td>
<td>&lt;61.09</td>
<td>&lt;0.0061</td>
</tr>
<tr>
<td>51-LS-2</td>
<td>&lt;74.93</td>
<td>&lt;0.0075</td>
</tr>
<tr>
<td>51-LS-3</td>
<td>445.01</td>
<td>0.0445</td>
</tr>
<tr>
<td>49-LS-1</td>
<td>&lt;83.47</td>
<td>&lt;0.0083</td>
</tr>
</tbody>
</table>

Notes:
The current guidelines for lead in paint from the Consumer Products Safety Council (CPSC) is 0.06% by weight; the Housing and Urban Development (HUD) guideline is 0.5% by weight.

CA Labs is participating in ELPAT rounds sponsored by American Industrial Hygiene Association (AIHA) and National Lead Laboratory Program (NVLAP). This test report relates only to the items tested.

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Analysis performed at CA Labs, LLC. 12232 Industriplex Blvd, Suite 32, Baton Rouge, LA 70809. Phone 225-751-5632, fax 225-751-5634, after hours mobile 225-993-3471.
Atomic Absorption Lead Report

Analysis Method: Lead in Paint analyzed by Atomic Absorption (AA)/SW-846-7420;
This analysis is not covered by the scope of accreditation by NVLAP or AIHA.

Sample Prep Method: Samples are dissolved in nitric acid, extracted, and analyzed on a properly calibrated AA; Absorbency curve was calculated, bandwidth corrected, and wavelength at the time of the analysis was measured and recorded.

<table>
<thead>
<tr>
<th>Sample#</th>
<th>Sample Concentration: parts per million (ppm)</th>
<th>Weight Percent:</th>
</tr>
</thead>
<tbody>
<tr>
<td>49-LS-2</td>
<td>516.59</td>
<td>0.0517</td>
</tr>
<tr>
<td>49-LS-3</td>
<td>97.76</td>
<td>0.0098</td>
</tr>
<tr>
<td>47-LS-1</td>
<td>540.43</td>
<td>0.0540</td>
</tr>
<tr>
<td>47-LS-2</td>
<td>&lt;110.25</td>
<td>&lt;0.0110</td>
</tr>
<tr>
<td>47-LS-3</td>
<td>&lt;75.39</td>
<td>&lt;0.0075</td>
</tr>
<tr>
<td>Lab Blank</td>
<td>&lt; 1.00</td>
<td>----</td>
</tr>
</tbody>
</table>

Quality Control:
Duplicate: 1.00 RPD
Spike: 99.4% Recovery

Notes:
The current guidelines for lead in paint from the Consumer Products Safety Council (CPSC) is 0.06% by weight; the Housing and Urban Development (HUD) guideline is 0.5% by weight.
CA Labs is participating in ELPAT rounds sponsored by American Industrial Hygiene Association (AIHA) and National Lead Laboratory Program (NVLAP). This test report relates only to the items tested.
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Analysis performed at CA Labs, LLC. 12232 Industriplex Blvd, Suite 32, Baton Rouge, LA 70809. Phone 225-751-5632, fax 225-751-5634, after hours mobile 225-993-3471.
exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6
reference number: CBR1303830

LABORATORY ANALYSIS:

Summary of lead analysis by atomic absorption in all relevant media using the method described in SW-846-7420. All analysts have received the necessary in-house and extramural training to perform analysis of samples for the presence of lead. A duplicate analysis is performed on greater than ten percent of all samples. A spiked concentration sample is analyzed with each sample group for instrument calibration. All analysts are required to participate in quality control analysis rounds. Instrument calibrations are performed on a daily, weekly, and monthly basis.

This report must not be used to claim product endorsement by AIHA or any agency of the U.S. Government. This test relates only to the items described and tested herein. This report may not be reproduced except in full, without written permission by CA Labs.

METHOD:

The procedure for paint chip analysis follows AOAC5.009(974.02) and SW-846-7420. The analysis of soil, wipes, and wastewater for the presence of lead is also referenced by SW-846-7420. Methodology for the analysis of lead in air samples follows NIOSH Method 7082.

Analysis performed at CA Labs, LLC. 12232 Industriplex Blvd, Suite 32, Baton Rouge, LA 70809. Phone 225-751-5632, fax 225-751-5634, after hours mobile 225-993-3471.
Analysis and Method

Summary of polarizing light microscopy (PLM / Stereomicroscopy bulk asbestos analysis) using the methods described in 40CFR Part 763 Appendix E to Subpart E (Interim and EPA 600 / R-93 / 116 (Improved). The sample is first viewed with the aid of stereomicroscopy. Numerous liquid slide preparations are created for analysis under the polarized microscope where identifications and quantifications are preformed. Calibrated liquid refractive oils are used as liquid mounting medium. These oils are used for identification (dispersion staining). A calibrated visual estimation is reported, should any asbestiform mineral be present. Other techniques such as acid washing are used in conjunction with refractive oils for detection of smaller quantities of asbestos. All asbestos percentages are based on calibrated visual estimation traceable to NIST standards for regulated of asbestos. Traceability to measurement and calibration is achieved by using known amounts and types of asbestos from standards where analyst and laboratory accuracy are measured. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 0.50% (well above the laboratory definition of trace).

Discussion

Vermiculite containing samples may have trace amounts of actinolite-tremolite, where not found be PLM should be analyzed using TEM methods and / or water separation techniques. Suspected actinolite/vermiculite presence will be indicated through the sample comment section of this report.

Fibrous talc containing samples may even contain a related asbestos fiber known as anthophyllite. Under certain conditions the same fiber may actually contain both talc and anthophyllite (a phenomenon called intergrowth). Again, TEM detection methods are recommended. CA Labs PLM report comments will denote suspected amounts of asbestiform anthophyllite with talc, where further analysis is recommended.

Some samples (floor tiles, surfacings, etc.) may contain fibers too small to be delectable by PLM analysis and should be analyzed by TEM bulk protocols.

A “trace asbestos” will be reported if the analyst observes far less than 1% asbestos. CA Labs defines “trace asbestos” as a few fibers detected by the analyst in several preparations and will indicate as such under these circumstances.

Quantification of <1% will actually be reported as <=1% (allowable variance close to 1% is high). Such results are ideal for point counting, and the technique is mandatory for friable samples (NESHAP, Nov. 1990 and clarification letter 8 May 1991) under 1% percent asbestos and the “trace asbestos”. In order to make all initial PLM reports issued from CA Labs NESHAP compliant, all <1% asbestos results (except floor tiles) will be point counted at no additional charge.

Qualifications

CA Labs is accredited by the National Voluntary Accreditation Program (NVLAP) for selected test methods for airborne fiber analysis (TEM), and for bulk asbestos fiber analysis (PLM). All analysts have a college degree in a natural science (geology, biology, or environmental science) or are recognized by a state professional board in one these disciplines. Extensive in-house training programs are used to augment education background of the analyst. The group leader of polarized light has received supplemental McCrone Research training for asbestos identification. This report is not covered by the scope of AIHA accreditation. Analysis performed at CA Labs, LLC, 12232 Industriplex, Suite 32, Baton Rouge, LA 70809.
Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Customer Project:</th>
<th>CA Labs Project #:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCC 6/ OTT-00211242-A0</td>
<td>CBR1303829</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>asbestos type / calibrated visual estimate percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>48J-AS-1a</td>
<td>1</td>
<td>white surfaced white compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>48J-AS-1b</td>
<td>1</td>
<td>off-white compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>48J-AS-1c</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>48J-AS-2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>48J-AS-2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>55-AS-6a</td>
<td>1</td>
<td>white surfaced brown sealant</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>55-AS-2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>55-AS-2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
</tbody>
</table>

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):
- ca: carbonate
- gypsum: gypsum
- bi: binder
- or: organic
- ma: matrix
- mi: mica
- ve: vermiculite
- ot: other
- po: perlite
- qu: quartz
-tg: fiberglass
-rw: mineral wool
-wo: wollastonite
-ta: talc
-sy: synthetic
-co: cellulose
-br: brucite
-ka: kaolin (clay)

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## Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Customer Project:</th>
<th>CA Labs Project #:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCC 6 / OTT-00211242-A0</td>
<td>CBR1303829</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-AS-2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>55-AS-2d</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>55-AS-2e</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>55-AS-1c</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>55-AS-1d</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>896-AS-1a</td>
<td>1</td>
<td>green surfaced off-white compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>896-AS-1b</td>
<td>1</td>
<td>tan surfaced off-white compound</td>
<td>1% Chrysotile</td>
</tr>
<tr>
<td>896-AS-1c</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
</tr>
</tbody>
</table>

Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM LDEQ

TDH 30-0370

### Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

- **ca**: carbonate
- **gypsum**: gypsum
- **bi**: binder
- **or**: organic
- **ma**: matrix
- **mi**: mica
- **ve**: vermiculite
- **ot**: other
- **po**: perlite
- **qu**: quartz
- **tq**: fiber/mica
- **mr**: mineral wool
- **wo**: wollastonite
- **ta**: talc
- **sy**: synthetic
- **ce**: cellulose
- **br**: brucite
- **ka**: kaolin (clay)
- **pa**: palygorskite (clay)

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## Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts' Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>List of Affected Building Material Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>896-AS-1d</td>
<td>1</td>
<td>white surfaced off-white</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>896-AS-1e</td>
<td>1</td>
<td>white surfaced off-white</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>896-AS-2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>896-AS-2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>896-AS-2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>896-AS-2d</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>896-AS-2e</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>896-AS-4a</td>
<td>1</td>
<td>off-white sealant</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

**Glossary of abbreviations (non-asbestos fibers and non-fibrinous minerals):**

- **ca** - carbonate
- **gypsum** - gypsum
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- **tg** - fiberglass
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- **sy** - synthetic
- **ce** - cellulose
- **br** - brucite
- **ka** - kaolin (clay)
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<tr>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>898-AS-1a</td>
<td>1</td>
<td>off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>898-AS-1b</td>
<td>1</td>
<td>off-white compound</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>898-AS-1c</td>
<td>1</td>
<td>tan surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>898-AS-1d</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>898-AS-1e</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>898-AS-2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>898-AS-2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>898-AS-2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
</tbody>
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- br: brucite
- ka: kaolin (clay)

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### Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Customer Project: CCC 6/ OTT-00211242-A0</th>
<th>CA Labs Project #: CBR1303829</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample #</strong></td>
<td><strong>Layer #</strong></td>
</tr>
<tr>
<td>898-AS-2d</td>
<td>1</td>
</tr>
<tr>
<td>898-AS-2e</td>
<td>1</td>
</tr>
<tr>
<td>914B-AS-1b</td>
<td>1</td>
</tr>
<tr>
<td>914B-AS-1c</td>
<td>1</td>
</tr>
<tr>
<td>914B-AS-2a</td>
<td>1</td>
</tr>
<tr>
<td>914B-AS-2b</td>
<td>1</td>
</tr>
<tr>
<td>914B-AS-2c</td>
<td>1</td>
</tr>
<tr>
<td>51-AS-1a</td>
<td>1</td>
</tr>
</tbody>
</table>

**Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):**

- ca - carbonate
- gypsum - gyspum
- bi - binder
- or - organic
- ma - matrix
- mi - mica
- ve - vermiculite
- ot - other
- po - perlite
- qu - quartz
- fg - fiberglass
- mw - mineral wool
- wo - wollastonite
- ta - talc
- sy - synthetic
- ce - cellulose
- br - brucite
- ka - kaolin (clay)

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Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-AS-1b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>51-AS-1c</td>
<td>1</td>
<td>white surfaced off-white</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>51-AS-1d</td>
<td>1</td>
<td>white surfaced off-white</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>51-AS-1e</td>
<td>1</td>
<td>white surfaced off-white</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>51-AS-2a</td>
<td>1</td>
<td>gray surfaced off-white</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>51-AS-2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>51-AS-2d</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
</tbody>
</table>

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

carbonate - ca
gypsum - gyp
bis - binder
organic - or
matrix - ma
mica - mi
vermiculite - ve
other - ot
perlite - pe
quartz - qu
fiberglass - fg
mineral wool - mw
wollastonite - wo
talc - ta
synthetic - sy
cellulose - ce
brucite - br
kaolinite (clay) - ka

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## Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>List of Affected Building Material Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-AS-2e</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>51-AS-4a</td>
<td>1</td>
<td>brown sealant</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-1a</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-1b</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-1c</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-1d</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-1e</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

**List of Affected Building Material Types**

- 2% Chrysotile
- 5% Chrysotile

**Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):**

- **ca** = carbonate
- **gyp** = gypsum
- **bi** = binder
- **or** = organic
- **ma** = matrix
- **mi** = mica
- **ve** = vermiculite
- **ot** = other
- **pe** = perlite
- **qu** = quartz
- **fg** = fiberglass
- **mw** = mineral wool
- **wo** = wollastonite
- **ta** = talc
- **sy** = synthetic
- **ce** = cellulose
- **br** = brucite
- **ka** = kaolin (clay)

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## Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>List of Affected Building Material Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>49-AS-2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-2d</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-2e</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>49-AS-5a</td>
<td>1</td>
<td>white sealant</td>
<td>1% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>47-AS-1a</td>
<td>1</td>
<td>off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>47-AS-1b</td>
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<td>compound</td>
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</tr>
<tr>
<td>47-AS-1c</td>
<td>1</td>
<td>compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subsample</th>
<th>Layer</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>List of Affected Building Material Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>47-AS-1a</td>
<td>1</td>
<td>off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>47-AS-1b</td>
<td>1</td>
<td>compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>47-AS-1c</td>
<td>1</td>
<td>compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

### Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):
- **ca** - carbonate
- **gypsum** - gypsum
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- **mw** - mineral wool
- **wo** - wollastonite
- **ta** - talc
- **sy** - synthetic
- **ce** - cellulose
- **br** - brucite
- **ka** - kaolin (clay)
- **pa** - palygorskite (clay)

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<table>
<thead>
<tr>
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<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type</th>
<th>calibrated visual estimate percent</th>
<th>List of Affected Building Material Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>47-AS-1d</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-1e</td>
<td>1</td>
<td>white surfaced off-white compound</td>
<td>2% Chrysotile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-2d</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-2e</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Glossary of abbreviations (non-asbestos fibers and non-fibrinous minerals):

- ca - carbonate
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- bi - binder
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## Polarized Light Asbestiform Materials Characterization

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer #</th>
<th>Analysts</th>
<th>Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>Non-asbestos fiber type / percent</th>
<th>Non-fibrous type / percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>48J-AS-1a</td>
<td>1</td>
<td></td>
<td></td>
<td>white surfaced white compound</td>
<td>N 2% Chrysotile</td>
<td>98% mi, bi, ca</td>
<td></td>
</tr>
<tr>
<td>48J-AS-1b</td>
<td></td>
<td></td>
<td></td>
<td>off-white compound</td>
<td>Y 2% Chrysotile</td>
<td>98% mi, ca</td>
<td></td>
</tr>
<tr>
<td>48J-AS-1c</td>
<td></td>
<td></td>
<td></td>
<td>white surfaced off-white compound</td>
<td>N 2% Chrysotile</td>
<td>98% mi, bi, ca</td>
<td></td>
</tr>
<tr>
<td>48J-AS-2a</td>
<td>1</td>
<td></td>
<td></td>
<td>white textured surfacing</td>
<td>Y None Detected</td>
<td>2% ta</td>
<td>98% qu, ca, bi</td>
</tr>
<tr>
<td>48J-AS-2b</td>
<td>1</td>
<td></td>
<td></td>
<td>white textured surfacing</td>
<td>Y 3% Chrysotile</td>
<td>97% qu, ca, bi</td>
<td></td>
</tr>
<tr>
<td>48J-AS-2c</td>
<td>1</td>
<td></td>
<td></td>
<td>white textured surfacing</td>
<td>Y 5% Chrysotile</td>
<td>95% qu, ca, bi</td>
<td></td>
</tr>
<tr>
<td>55-AS-4a</td>
<td>1</td>
<td></td>
<td></td>
<td>white sealant</td>
<td>Y None Detected</td>
<td>2% ce</td>
<td>98% qu, ca, bi</td>
</tr>
</tbody>
</table>

**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600/R-93/116)

**Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

**Approved Signatories:**

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting historical percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze
### Polarized Light Asbestiform Materials Characterization

**Customer Info:**
- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- 100-2650 Queensview Dr.
- Ottawa, ON K2B 8H6
- **Phone #** 613-688-1899
- **Fax #** 613-225-7337

**Customer Project:**
- **CCC 6/ OTT-00211242-A0**
- **Date:** 3/27/2013
- **Samples Received:** 3/25/13 10 AM
- **Date Of Sampling:** 3/21/2013
- **Purchase Order #:** CCC 6/ OTT-00211242-A0

**Laboratory Director:**
- Chris Williams
- Analyst Alicia Stretz

**Sample Analysis Details:**

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer</th>
<th>Analyst</th>
<th>Physical Description of Subsample</th>
<th>Homogeneity</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>Non-asbestos fiber type / percent</th>
<th>Non-fibrous type / percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-AS-4b</td>
<td>1 white sealant</td>
<td>Y</td>
<td>None Detected</td>
<td>4% ce</td>
<td>96% qu, ca, bi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-4c</td>
<td>1 white sealant</td>
<td>Y</td>
<td>None Detected</td>
<td>2% ce</td>
<td>98% qu, ca, bi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-5a</td>
<td>1 brown sealant</td>
<td>Y</td>
<td>None Detected</td>
<td>100% qu, ca, bi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-5b</td>
<td>1 brown sealant</td>
<td>Y</td>
<td>None Detected</td>
<td>2% ce</td>
<td>98% qu, ca, bi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-5c</td>
<td>1 brown sealant</td>
<td>Y</td>
<td>None Detected</td>
<td>100% qu, ca, bi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-6a</td>
<td>1 white surfaced brown sealant</td>
<td>N</td>
<td>2% Chrysotile</td>
<td>98% qu, ca, bi</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-6b</td>
<td>1 white surfaced brown sealant</td>
<td>N</td>
<td>Positive-Stop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

**Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

**Approved Signatories:**
- Chris Williams
  - Analyst
- Senior Analyst Alicia Stretz
- Laboratory Director Chris Williams

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze
6. Anthophylite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested
### Polarized Light Asbestiform Materials Characterization

**Customer Info:**
- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- 100-2650 Queensview Dr.
- Ottawa, ON K2B 8H6

**Phone #** 613-688-1899
**Fax #** 613-225-7337

**CA Labs Project #:** CBR1303829
**Date:** 3/27/2013
**Turnaround Time:** 3 Day
**Samples Received:** 3/25/13 10 AM
**Date Of Sampling:** 3/21/2013
**Purchase Order #:** CCC 6/ OTT-00211242-A0

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Homogeneous US (Y/N)</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>Non-asbestos fiber type / percent</th>
<th>Non-fibrous type / percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-AS-6c</td>
<td>1</td>
<td>white surfaced brown sealant</td>
<td>N  Positive-Stop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-3a</td>
<td>1</td>
<td>off-white floor tile</td>
<td>Y  None Detected</td>
<td>2% ce</td>
<td>98% qu, ca</td>
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<td></td>
</tr>
<tr>
<td>55-AS-3b</td>
<td>1</td>
<td>off-white floor tile</td>
<td>Y  None Detected</td>
<td>2% ce</td>
<td>98% qu, ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-3c</td>
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<td>Y  None Detected</td>
<td>2% ce</td>
<td>98% qu, ca</td>
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<td></td>
</tr>
<tr>
<td>55-AS-2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>Y  5% Chrysotile</td>
<td>95% qu, bi, ca</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>Y  5% Chrysotile</td>
<td>95% qu, bi, ca</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>55-AS-2c</td>
<td>1</td>
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<td>Y  5% Chrysotile</td>
<td>95% qu, bi, ca</td>
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---

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

---

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze
6. Amphibolite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested
### Polarized Light Asbestiform Materials Characterization

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer #</th>
<th>Analysts</th>
<th>Physical Description of Subsample</th>
<th>Homogeneity US (Y/N)</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>Non-asbestos fiber type / percent</th>
<th>Non-fibrous type / percent</th>
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<td>1</td>
<td>Alicia Stretz</td>
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<td>3% Chrysotile</td>
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<td>97% qu, bi, ca</td>
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### Analysis Method: Interim (40 CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

- **Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / beckle line method.

- **Dedicated to Quality**

  - CA Labs
  - Dedicated to Quality
  - Crisp Analytical, L.L.C.
    - 1929 Old Denton Road
    - Carrollton, TX 75006
    - Phone 972-242-2754
    - Fax 972-242-2798
  - CA Labs, L.L.C.
    - 12232 Industriplex, Suite 32
    - Baton Rouge, LA 70809
    - Phone 225-751-5632
    - Fax 225-751-5634

---

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting fibrous percentages
3. Activitable in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
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10. TEM analysis suggested
### Polarized Light Asbestiform Materials Characterization

**Customer Info:**  
**Attn:** Shawn Doherty  
**exp Services, Inc.**  
100-2650 Queensview Dr.  
Ottawa, ON K2B 8H6

**Phone #** 613-688-1899  
**Fax #** 613-225-7337

**Sample #**  
**Comm**ent **Layer**  
**Analysts**  
**Physical Description of** Subsample  
**Homogeneous**  
**US** (Y/N)  
**Asbestos type / calibrated visual estimate percent**  
**Non-asbestos fiber type / percent**  
**Non-fibrous type / percent**

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<th>US (Y/N)</th>
<th>Asbestos Type</th>
<th>Non-asbestos Fiber</th>
<th>Non-fibrous Fiber</th>
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<td>95% qu, bi, ca</td>
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**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600/R-93/116)  
**Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

**Approved Signatories:**

Chris Williams  
**Analyst**

Alicia Stretz  
**Senior Analyst**

Chris Williams  
**Laboratory Director**

---

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers  
2. Fire Damage no significant fiber damages affecting fibrous percentages  
3. Activated in association with Vermiculite  
4. Layer not analyzed - attached to previous positive layer and contamination is suspected  
5. Not enough sample to analyze  
6. Anthophyllite in association with Fibrous Talc  
7. Contamination suspected from other building materials  
8. Favorable scenario for water separation on vermiculite for possible analysis by another method  
9. < 1% Result point counted positive  
10. TEM analysis suggested
Polarized Light Asbestiform Materials Characterization

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<th>Customer Project</th>
<th>CA Labs Project #</th>
<th>Date: 3/27/2013</th>
<th>Samples Received: 3/25/13 10 AM</th>
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</thead>
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<td>95% qu, bi, ca</td>
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<td>98% qu, ma</td>
<td></td>
<td></td>
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<tr>
<td>896-AS-3b</td>
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<td>tan rubber floor tile</td>
<td>Y</td>
<td>None Detected</td>
<td>2% ce</td>
<td>98% qu, ma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>896-AS-3c</td>
<td>1</td>
<td>tan rubber floor tile</td>
<td>Y</td>
<td>None Detected</td>
<td>2% ce</td>
<td>98% qu, ma</td>
<td></td>
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</tr>
<tr>
<td>896-AS-4a</td>
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<td>95% qu, ca, bl</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

CA Labs NVLAP Lab Code 200772-0 TEM/PLM TDH 30-0370

LDEQ

- 1. Fire Damage significant fiber damage – reported percentages reflect unlensed fibers
- 2. Fire Damage no significant fiber damages affecting fibrous percentages
- 3. Actinolite in association with Vermiculite
- 4. Layer not analyzed - attached to previous positive layer and contamination is suspected
- 5. Not enough sample to analyze
- 6. Amphibole in association with Talc
- 7. Contamination suspected from other building materials
- 8. Favorable scenario for water separation on vermiculite for possible analysis by another method
- 9. < 1% Result point counted positive
- 10. TEM analysis suggested

Approved Signatories:

Chris Williams
Analyst

Alicia Stretz
Senior Analyst

Chris Williams
Laboratory Director

Shawn Doherty
CA Labs Project #: CBR1303829

Date: 3/21/2013

Sample # Comment Layer # Analysts Physical Description of Subsample Homogeneity Asbestos type / calibrated visual estimate percent Non-asbestos fiber type / percent Non-fibrous type / percent

CA Labs
1929 Old Denton Road
Carrollton, TX 75006
Phone 972-242-2754
Fax 972-242-2798

CA Labs, L.L.C.
12232 Industriplex, Suite 32
Baton Rouge, LA 70809
Phone 225-751-5632
Fax 225-751-5634

Dedicated to Quality
### Polarized Light Asbestiform Materials Characterization

**Customer Info:**
- **Attn:** Shawn Doherty  
- **exp Services, Inc.**  
- 100-2650 Queensview Dr.  
- Ottawa, ON K2B 8H6

**Phone #** 613-688-1899  
**Fax #** 613-225-7337

**Sample #**  | **Comment** | **Layer** | **Analysts Physical Description of Subsample** | **Homogeneity** | **Asbestos type / calibrated visual estimate percent** | **Non-asbestos fiber type / percent** | **Non-fibrous type / percent** |
--- | --- | --- | --- | --- | --- | --- | --- |
896-AS-4b | 1 | off-white sealant | Y | Positive-Stop |  |  |  |
896-AS-4c | 1 | off-white sealant | Y | Positive-Stop |  |  |  |
896-AS-5a | 1 | brown sealant | Y | None Detected | 100% qu, ca, bi |  |  |
896-AS-5b | 1 | brown sealant | Y | None Detected | 100% qu, ca, bi |  |  |
896-AS-5c | 1 | brown sealant | Y | None Detected | 100% qu, ca, bi |  |  |
896-AS-6a | 1 | brown surfaced white sealant | N | None Detected | 100% qu, ca, bi |  |  |
896-AS-6b | 1 | brown surfaced white sealant | N | None Detected | 100% qu, ca, bi |  |  |

**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

**Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

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Polarized Light Asbestiform Materials Characterization

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<td>100% qu, ca, bi</td>
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<tr>
<td>898-AS-1a</td>
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<td>off-white compound</td>
<td>Y</td>
<td>2% Chrysotile</td>
<td></td>
<td>98% mi, ca</td>
<td></td>
</tr>
<tr>
<td>898-AS-1b</td>
<td>1</td>
<td>off-white compound</td>
<td>Y</td>
<td>3% Chrysotile</td>
<td></td>
<td>97% mi, ca</td>
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<tr>
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<tr>
<td>898-AS-2a</td>
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<td>Y</td>
<td>5% Chrysotile</td>
<td></td>
<td>95% qu, bi, ca</td>
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</table>

Analysis Method: Interim (40CFR Part 763 Appendix C to Subpart E) / Improved (EPA-600 / R-93/116)

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

Approved Signatories:

Chris Williams
Analyst

Senior Analyst
Alicia Stretz

Laboratory Director
Chris Williams

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# Polarized Light Asbestiform Materials Characterization

**Customer Info:**
- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- **100-2650 Queensview Dr.**
- **Ottawa, ON K2B 4H6**

**Phone #:** 613-688-1899  
**Fax #:** 613-225-7337

**Date:** 3/27/2013  
**3/25/13 10 AM**

**Laboratory Director:** Chris Williams  
**Analyst:** Alicia Stretz

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**Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM**  
**TDH 30-0370**

**LDEQ**

**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

**Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

Approved Signatories:

- **Chris Williams**  
  **Senior Analyst**  
  **Laboratory Director**

- **Alicia Stretz**  
  **Chris Williams**

---

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages effecting fibrous percentages
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Polarized Light Asbestiform Materials Characterization

Customer Info: Attn: Shawn Doherty
exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6
Phone # 613-688-1899
Fax # 613-225-7337

Customer Project: CCC 6/ OTT-00211242-A0
Turnaround Time: 3 Day
Date: 3/27/2013
Samples Received: 3/25/13 10 AM
Date Of Sampling: 3/21/2013
Purchase Order #: CCC 6/ OTT-00211242-A0

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<td>1</td>
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LDEQ
Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

Approved Signatories:

Chris Williams
Analyst

Alicia Stretz
Senior Analyst

Chris Williams
Laboratory Director

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
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8. < 1% Result point counted positive
9. Favorable scenario for water separation on vermiculite for possible analysis by another method
10. TEM analysis suggested
## Polarized Light Asbestiform Materials Characterization

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer #</th>
<th>Analysts</th>
<th>Physical Description of Subsample</th>
<th>Homogeneity</th>
<th>Asbestos type / calibrated visual estimate percent</th>
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<th>Non-fibrous type / percent</th>
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</thead>
<tbody>
<tr>
<td>51-AS-1a</td>
<td></td>
<td></td>
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<td>white textured surfing</td>
<td>Y</td>
<td>5% Chrysotile</td>
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<tr>
<td>51-AS-1b</td>
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<td>95% qu, bi, ca</td>
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<tr>
<td>51-AS-1c</td>
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<td>white surfaced off-white compound</td>
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<td>97% mi, bi, ca</td>
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<td>2% Chrysotile</td>
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<td></td>
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Approved Signatories:

- Chris Williams
- Senior Analyst
- Alicia Stretz
- Laboratory Director
- Chris Williams

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
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## Polarized Light Asbestiform Materials Characterization

### Customer Info: exp Services, Inc.
- **Attn:** Shawn Doherty
- **Address:** 500 Queensview Dr.
- **City:** Ottawa, ON K2B 8H6
- **Phone #:** 613-688-1899
- **Fax:** 613-225-7337

### Customer Project: CCC 6/OTT-00211242-A0
- **Date:** 3/27/2013
- **Samples Received:** 3/25/13 10 AM
- **Date Of Sampling:** 3/21/2013
- **Purchase Order #:** CCC 6/OTT-00211242-A0

### Analysis Method:
- Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600/R-93/116)

### Preparation Method:
- HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / beckle line method.

### CA Labs Project #: CBR1303829

### Laboratories:
- CA Labs
- Dedicated to Quality
- Dedicated to Quality
- Dedicated to Quality
- Dedicated to Quality

---

### Sample # | Comment | Layer # | Analysts Physical Description of Subsample | Homogeneity US (Y/N) | Asbestos type / calibrated visual estimate percent | Non-asbestos fiber type / percent | Non-fibrous type / percent
---

| 51-AS-2c | 1 | white textured surfacing | Y | 3% Chrysotile | 97% qu, bi, ca | |
| 51-AS-2d | 1 | white textured surfacing | Y | 5% Chrysotile | 95% qu, bi, ca | |
| 51-AS-2e | 1 | white textured surfacing | Y | 5% Chrysotile | 95% qu, bi, ca | |
| 51-AS-3a | 1 | tan rubber floor tile | Y | None Detected | 100% qu, ma | |
| 51-AS-3b | 1 | tan rubber floor tile | Y | None Detected | 100% qu, ma | |
| 51-AS-3c | 1 | tan rubber floor tile | Y | None Detected | 100% qu, ma | |
| 51-AS-4a | 1 | brown sealant | Y | 3% Chrysotile | 97% qu, ca, bi | |

---

**Note:**
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9. 1% Result point counted positive
10. TEM analysis suggested
Polarized Light Asbestiform Materials Characterization

Customer Info: Attn: Shawn Doherty

exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6

Phone # 613-688-1899
Fax # 613-225-7337

Customer Project: CCC 6/ OTT-00211242-A0

CA Labs Project #: CBR1303829

Date: 3/27/2013
Turnaround Time: 3 Day

Samples Received: 3/25/13 10 AM
Purchase Order #: ____________

Laboratory Director
Chris Williams
Analyst Alicia Stretz

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<td>Positive-Stop</td>
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<tr>
<td>49-AS-1a</td>
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<td>white surfaced off-white compound</td>
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<td>2% Chrysotile</td>
<td>98% mi, bi, ca</td>
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Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM

LEDEQ

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

Approved Signatories:

Chris Williams
Analyst

Senior Analyst
Alicia Stretz

Laboratory Director
Chris Williams
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<tr>
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<td>1</td>
<td>tan rubber floor tile</td>
<td>Y</td>
<td>None Detected</td>
<td>100% qu, ma</td>
<td></td>
</tr>
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</table>

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# Polarized Light Asbestiform Materials Characterization

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<thead>
<tr>
<th>Customer Info:</th>
<th>Attn: Shawn Doherty exp Services, Inc.</th>
<th>Customer Project:</th>
<th>CA Labs Project #:</th>
<th>Date:</th>
<th>Purchase Order #:</th>
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<td>3/25/13 10 AM</td>
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<td>Date Of Sampling:</td>
<td>3/21/2013</td>
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<th>Sample #</th>
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<td></td>
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<td>98% qu, ca, bi</td>
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Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM TDH 30-0370

**LDEQ**

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
<th>Description</th>
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</thead>
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<td>ca - carbonate</td>
<td>mica</td>
<td>fiber glass</td>
</tr>
<tr>
<td>gypsum - gypsum</td>
<td>va - vermiculite</td>
<td>me - mineral wool</td>
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<tr>
<td>bi - binder</td>
<td>ot - other</td>
<td>wo - wollastonite</td>
</tr>
<tr>
<td>or - organic</td>
<td>pe - petite</td>
<td>ta - talc</td>
</tr>
<tr>
<td>ma - matrix</td>
<td>qu - quartz</td>
<td>sy - synthetic</td>
</tr>
</tbody>
</table>

Chris Williams
Analyst

Alicia Stretz
Senior Analyst

Chris Williams
Laboratory Director

---

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10. TEM analysis suggested
## Polarized Light Asbestiform Materials Characterization

### Customer Info
- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- 100-2650 Queensview Dr., Ottawa, ON K2B 8H6
- **Phone #** 613-688-1899
- **Fax #** 613-225-7337

### Customer Project
- **CCC 6/ OTT-00211242-A0**
- **Date:** 3/27/2013
- **Tumaround Time:** 3 Day
- **Samples Received:** 3/25/13 10 AM
- **Date Of Sampling:** 3/21/2013
- **Purchase Order #:** CBR1303829

### Analysis Method
- **CA Labs Project #:** CBR1303829
- **Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.
- **Non-asbestos fiber type / percent**
- **Non-fibrous type / percent**

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<td>1</td>
<td>off-white compound</td>
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<td>98% mi, ca</td>
<td></td>
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### Reference
- **CA Labs, L.L.C.**
- 12232 Industriplex, Suite 32, Baton Rouge, LA 70809
- Phone 225-751-5632
- Fax 225-751-5634

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8. <1%. Result point counted negative
9. Favorable scenario for water separation on vermiculite for possible analysis by another method
10. TEM analysis suggested

---

**Approved Signatories:**
- **Chris Williams**
  - Analyst
- **Senior Analyst**
  - Alicia Stretz
- **Laboratory Director**
  - Chris Williams
# Polarized Light Asbestiform Materials Characterization

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**Samples Received:** 3/25/13 10 AM  
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<tr>
<td>47-AS-2e</td>
<td>1</td>
<td>white textured surfacing</td>
<td>Y</td>
<td>5% Chrysotile</td>
<td>95% qu, bi, ca</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-3a</td>
<td>1</td>
<td>tan rubber floor tile</td>
<td>Y</td>
<td>None Detected</td>
<td>100% qu, ma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-3b</td>
<td>1</td>
<td>tan rubber floor tile</td>
<td>Y</td>
<td>None Detected</td>
<td>100% qu, ma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-3c</td>
<td>1</td>
<td>tan rubber floor tile</td>
<td>Y</td>
<td>None Detected</td>
<td>100% qu, ma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47-AS-4a</td>
<td>1</td>
<td>brown sealant</td>
<td>Y</td>
<td>None Detected</td>
<td>2% ce</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Notes:

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers  
2. Fire Damage no significant fiber damages affecting fibrous percentages  
3. Asbestos in association with Vermiculite  
4. Layer not analyzed - attached to previous positive layer and contamination is suspected  
5. Not enough sample to analyze  
6. Amphibolite in association with Fibrous Talc  
7. Contamination suspected from other building materials  
8. < 1% Result point counted positive  
9. Favorable scenario for water separation on Vermiculite for possible analysis by another method  
10. TEM analysis suggested
### Polarized Light Asbestiform Materials Characterization

**Customer Info:**
- Attn: Shawn Doherty
- exp Services, Inc.
- 100-2650 Queensview Dr.
- Ottawa, ON K2B 8H6

**Phone #:** 613-688-1899
**Fax #:** 613-225-7337

**Customer Project:**
- CCC 6/ OTT-00211242-A0
- Turnaround Time: 3 Day

**CA Labs Project #:** CBR1303829
**Date:** 3/27/2013
**Samples Received:** 3/25/13 10 AM
**Date Of Sampling:** 3/21/2013
**Purchase Order #:**

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Homogeneo US (Y/N)</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>Non-asbestos fiber type / percent</th>
<th>Non-fibrous type / percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>47-AS-4b</td>
<td>Y</td>
<td>1</td>
<td>brown sealant</td>
<td></td>
<td>None Detected</td>
<td>2% ce</td>
<td>98% qu, ca, bi</td>
</tr>
<tr>
<td>47-AS-4c</td>
<td>Y</td>
<td>1</td>
<td>brown sealant</td>
<td></td>
<td>None Detected</td>
<td>2% ce</td>
<td>98% qu, ca, bi</td>
</tr>
</tbody>
</table>

**Analysis Method:**
- Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

**Preparation Method:**
- HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

<table>
<thead>
<tr>
<th>Ca - carbonate</th>
<th>Mi - mica</th>
<th>Fg - fiberglass</th>
<th>Cs - cellulose</th>
<th>Gp - gypsum</th>
<th>Ve - vermiculite</th>
<th>Mw - mineral wool</th>
<th>Wo - wollastonite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi - binder</td>
<td>Ot - other</td>
<td>Ta - talc</td>
<td>Br - brucite</td>
<td>Or - organic</td>
<td>Pe - profile</td>
<td>Sy - synthetic</td>
<td>Ka - kaolinite</td>
</tr>
<tr>
<td>Ma - matrix</td>
<td>Qu - quartz</td>
<td></td>
<td></td>
<td>Ot - others</td>
<td></td>
<td></td>
<td>Pa - pyrophyllite</td>
</tr>
<tr>
<td>Ve - vermiculite</td>
<td></td>
<td></td>
<td></td>
<td>Or - organic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ma - matrix</td>
<td>Qu - quart</td>
<td></td>
<td></td>
<td>Ot - others</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Approved Signatories:**
- Chris Williams
  - Analyst
- Senior Analyst
  - Alicia Stretz
- Laboratory Director
  - Chris Williams

---

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze
6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested

---

Page 28 of 28
Atomic Absorption Lead Report

Analysis Method: Lead in Paint analyzed by Atomic Absorption (AA)/SW-846-7420; This analysis is not covered by the scope of accreditation by NVLAP or AIHA.

Sample Prep Method: Samples are dissolved in nitric acid, extracted, and analyzed on a properly calibrated AA; Absorbency curve was calculated, bandwidth corrected, and wavelength at the time of the analysis was measured and recorded.

Client Information: exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6
Phone: 613-225-9940
Fax: 613-225-7337

CA Labs Project #: CCC6/ OTT-00211242-AO
CA Labs Project #: CBRI303693
Date: 3/15/13

Client Information: exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6
Phone: 613-225-9940
Fax: 613-225-7337

CA Labs Project #: CCC6/ OTT-00211242-AO
CA Labs Project #: CBRI303693
Date: 3/15/13

Sample Concentration: parts per million (ppm) Weight Percent:

<table>
<thead>
<tr>
<th>Sample#</th>
<th>Concentration</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>902H-LS1</td>
<td>&lt;85.40</td>
<td>&lt;0.0085</td>
</tr>
<tr>
<td>900-LS1</td>
<td>&lt;58.45</td>
<td>&lt;0.0058</td>
</tr>
<tr>
<td>900-LS2</td>
<td>&lt;24.68</td>
<td>0.0075</td>
</tr>
<tr>
<td>900-LS3</td>
<td>&lt;119.69</td>
<td>&lt;0.0120</td>
</tr>
<tr>
<td>53C-LS1</td>
<td>133.55</td>
<td>0.0134</td>
</tr>
<tr>
<td>53C-LS2</td>
<td>&lt;175.90</td>
<td>0.0176</td>
</tr>
<tr>
<td>906B-LS1</td>
<td>985.00</td>
<td>0.0985</td>
</tr>
<tr>
<td>912E-LS1</td>
<td>109.70</td>
<td>0.0110</td>
</tr>
<tr>
<td>904E-LS1</td>
<td>239.80</td>
<td>0.0240</td>
</tr>
<tr>
<td>Lab Blank</td>
<td>&lt; 1.00</td>
<td>----</td>
</tr>
</tbody>
</table>

Quality Control:
Duplicate: ___90.2___ RPD
Spike: ___1.7___% Recovery

Notes:
The current guidelines for lead in paint from the Consumer Products Safety Council (CPSC) is 0.06% by weight; the Housing and Urban Development (HUD) guideline is 0.5% by weight.

CA Labs is participating in ELPAT rounds sponsored by American Industrial Hygiene Association (AIHA) and National Lead Laboratory Program (NVLAP). This test report relates only to the items tested.

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Analysis performed at CA Labs, LLC, 12232 Industriplex Blvd, Suite 32, Baton Rouge, LA 70809. Phone 225-751-5632, fax 225-751-5634, after hours mobile 225-993-3471.
exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6
reference number: CBR1303693

LABORATORY ANALYSIS:

Summary of lead analysis by atomic absorption in all relevant media using the method described in SW-846-7420. All analysts have received the necessary in-house and extramural training to perform analysis of samples for the presence of lead. A duplicate analysis is performed on greater than ten percent of all samples. A spiked concentration sample is analyzed with each sample group for instrument calibration. All analysts are required to participate in quality control analysis rounds. Instrument calibrations are performed on a daily, weekly, and monthly basis.

This report must not be used to claim product endorsement by AIHA or any agency of the U.S. Government. This test relates only to the items described and tested herein. This report may not be reproduced except in full, without written permission by CA Labs.

METHOD:

The procedure for paint chip analysis follows AOAC5.009(974.02) and SW-846-7420. The analysis of soil, wipes, and wastewater for the presence of lead is also referenced by SW-846-7420. Methodology for the analysis of lead in air samples follows NIOSH Method 7082.

Analysis performed at CA Labs, LLC. 12232 Industriplex Blvd, Suite 32, Baton Rouge, LA 70809. Phone 225-751-5632, fax 225-751-5634, after hours mobile 225-993-3471.
Materials Characterization - Bulk Asbestos Analysis

Laboratory Analysis Report - Polarized Light

exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6

Attn: Shawn Doherty
Customer Project: CCC6/ OTT-00211242-A0
Reference #: CBR1303692Amended
Date: 3/25/2013

Analysis and Method

Summary of polarizing light microscopy (PLM / Stereomicroscopy bulk asbestos analysis) using the methods described in 40CFR Part 763 Appendix E to Subpart E (Interim and EPA 600 / R-93 / 116 (Improved). The sample is first viewed with the aid of stereomicroscopy. Numerous liquid slide preparations are created for analysis under the polarized microscope where identifications and quantifications are preformed. Calibrated liquid refractive oils are used as liquid mounting medium. These oils are used for identification (dispersion staining). A calibrated visual estimation is reported, should any asbestiform mineral be present. Other techniques such as acid washing are used in conjunction with refractive oils for detection of smaller quantities of asbestos. All asbestos percentages are based on calibrated visual estimation traceable to NIST standards for regulated of asbestos. Traceability to measurement and calibration is achieved by using known amounts and types of asbestos from standards where analyst and laboratory accuracy are measured. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 0.50% (well above the laboratory definition of trace).

Discussion

Vermiculite containing samples may have trace amounts of actinolite-tremolite, where not found be PLM should be analyzed using TEM methods and / or water separation techniques. Suspected actinolite/vermiculite presence will be indicated through the sample comment section of this report.

Fibrous talc containing samples may even contain a related asbestos fiber known as anthophyllite. Under certain conditions the same fiber may actually contain both talc and anthophyllite (a phenomenon called intergrowth). Again, TEM detection methods are recommended. CA Labs PLM report comments will denote suspected amounts of asbestiform anthophyllite with talc, where further analysis is recommended.

Some samples (floor tiles, surfacings, etc.) may contain fibers too small to be delectable by PLM analysis and should be analyzed by TEM bulk protocols.

A “trace asbestos” will be reported if the analyst observes far less than 1% asbestos. CA Labs defines “trace asbestos” as a few fibers detected by the analyst in several preparations and will indicate as such under these circumstances.

Quantification of <1% will actually be reported as <=1% (allowable variance close to 1% is high). Such results are ideal for point counting, and the technique is mandatory for friable samples (NESHAP, Nov. 1990 and clarification letter 8 May 1991) under 1% percent asbestos and the "trace asbestos". In order to make all initial PLM reports issued from CA Labs NESHAP compliant, all <1% asbestos results (except floor tiles) will be point counted at no additional charge.

Qualifications

CA Labs is accredited by the National Voluntary Accreditation Program (NVLAP) for selected test methods for airborne fiber analysis (TEM), and for bulk asbestos fiber analysis (PLM). All analysts have a college degree in a natural science (geology, biology, or environmental science) or are recognized by a state professional board in one these disciplines. Extensive in-house training programs are used to augment education background of the analyst. The group leader of polarized light has received supplemental McCrone Research training for asbestos identification. This report is not covered by the scope of AIHA accreditation. Analysis performed at CA Labs, LLC 12232 Industriplex, Suite 32 Baton Rouge, LA 70809.
### Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Customer Project:</th>
<th>CA Labs Project #:</th>
<th>Sample #</th>
<th>Layer #</th>
<th>Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>List of Affected Building Material Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCC6/ OTT-00211242-AO</td>
<td>CBR1303692Amended</td>
<td>902H-AS1b</td>
<td>1</td>
<td>off-white compound</td>
<td>2% Chrysotile</td>
<td>off-white compound, white surfaced tan compound, white textured surfacing, off-white surfaced black sealant, white sealant, tan surfaced white compound, tan surfaced tan compound, green surfaced tan compound</td>
</tr>
<tr>
<td></td>
<td></td>
<td>902H-AS1c</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>902H-AS2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>902H-AS2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>4% Chrysotile</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>902H-AS2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>902H-AS3a</td>
<td>1</td>
<td>off-white surfaced black sealant</td>
<td>trace Chrysotile</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>902H-AS3b</td>
<td>1</td>
<td>off-white surfaced black sealant</td>
<td>trace Chrysotile</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>902H-AS3c</td>
<td>1</td>
<td>black sealant</td>
<td>trace Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

**Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):**

- ca - carbonate
- gypsum - gypsum
- bi - binder
- or - organic
- ma - matrix
- mi - mica
- ve - vermiculite
- ot - other
- po - perlite
- qu - quartz
- fg - fiberglass
- mw - mineral wool
- wo - wollastinite
- ta - talc
- sy - synthetic
- ce - cellulose
- br - brucite
- ka - kaolin (clay)

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## Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>45H-AS1a</strong></td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td><strong>45H-AS1b</strong></td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td><strong>45H-AS1c</strong></td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td><strong>45H-AS2a</strong></td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td><strong>45H-AS2b</strong></td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td><strong>45H-AS2c</strong></td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td><strong>900-AS1a</strong></td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td><strong>900-AS1b</strong></td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
</tr>
</tbody>
</table>

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

- **ca** - carbonate
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- **ot** - other
- **po** - perlite
- **qu** - quartz
- **fg** - fiberglass
- **mw** - mineral wool
- **wo** - wollastinite
- **la** - talc
- **sy** - synthetic
- **ce** - cellulose
- **br** - brucite
- **ka** - kaolin (clay)
- **pa** - palygorskite (clay)

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## Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Customer Project:</th>
<th>CCC6/ OTT-00211242-A0</th>
<th>CA Labs Project #:</th>
<th>CBR1303692Amended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample #</td>
<td>Layer #</td>
<td>Analysts Physical Description of Subsample</td>
<td>Asbestos type / calibrated visual estimate percent</td>
</tr>
<tr>
<td>900-AS1c</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>1% Chrysotile</td>
</tr>
<tr>
<td>900-AS1d</td>
<td>1</td>
<td>tan compound</td>
<td>1% Chrysotile</td>
</tr>
<tr>
<td>900-AS1e</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>1% Chrysotile</td>
</tr>
<tr>
<td>900-AS2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>900-AS2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>4% Chrysotile</td>
</tr>
<tr>
<td>900-AS2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>4% Chrysotile</td>
</tr>
<tr>
<td>900-AS2d</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>900-AS2e</td>
<td>1</td>
<td>white textured surfacing</td>
<td>4% Chrysotile</td>
</tr>
</tbody>
</table>

Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM TDH 30-0370

LDEQ

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

- ca - carbonate
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- bi - binder
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- wo - wollastonite
- ta - talc
- sy - synthetic
- co - cellulose
- br - brucite
- ka - kaolinite (clay)

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### Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>900-ASSa</td>
<td>white sealant</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>53C-AS1c</td>
<td>white surfaced tan compound</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>53C-AS2a</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>53C-AS2c</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>46G-AS1a</td>
<td>tan surfaced white compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>46G-AS1b</td>
<td>tan surfaced tan compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>46G-AS1c</td>
<td>tan surfaced white compound</td>
<td>3% Chrysotile</td>
</tr>
<tr>
<td>46G-AS2a</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
</tbody>
</table>

**Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):**

- ca: carbonate
- gypsum: gypsum
- bi: binder
- br: brucite
- ce: cellulose
- da: diatomite
- fg: fiberglass
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- mi: mica
- ot: other
- pa: palygorskite (clay)
- pe: perlite
- qu: quartz
- ta: talc
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- wr: wollastonite
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### Overview of Project Sample Material Containing Asbestos

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>List of Affected Building Material Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>46G-AS2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>trace Chrysotile</td>
<td></td>
</tr>
<tr>
<td>46G-AS2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>trace Chrysotile</td>
<td></td>
</tr>
<tr>
<td>910A-AS1a</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>910A-AS1c</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>910A-AS2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>910A-AS2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>910A-AS2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>4% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>906B-AS1a</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

**Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):**

- ca - carbonate
- gypsum - gypsum
- bi - binder
- or - organic
- ma - matrix
- mi - mica
- ve - vermiculite
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<tr>
<th>Sample #</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>CA Labs Project #: CBR1303692Amended</th>
</tr>
</thead>
<tbody>
<tr>
<td>906B-AS1b</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>906B-AS1c</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>906B-AS2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>906B-AS2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>906B-AS2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>912E-AS1a</td>
<td>1</td>
<td>tan surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>912E-AS1b</td>
<td>1</td>
<td>green surfaced tan compound</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>912E-AS1c</td>
<td>1</td>
<td>green surfaced tan compound</td>
<td>4% Chrysotile</td>
<td>Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM TDH 30-0370 LDEQ</td>
</tr>
</tbody>
</table>

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## Overview of Project Sample Material Containing Asbestos

### Customer Project:
- CCC6/ OTT-00211242-A0

### CA Labs Project #:
- CBR1303692Amended

### List of Affected Building Material Types

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<thead>
<tr>
<th>Sample #</th>
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<tbody>
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<tr>
<td>912E-AS2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>4% Chrysotile</td>
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<tr>
<td>908E-AS1b</td>
<td>1</td>
<td>tan surfaced white compound</td>
<td>2% Chrysotile</td>
</tr>
<tr>
<td>908E-AS2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
</tr>
<tr>
<td>908E-AS2c</td>
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<td>white textured surfacing</td>
<td>3% Chrysotile</td>
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<tr>
<td>904E-AS1a</td>
<td>1</td>
<td>white surfaced tan compound</td>
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<td>904E-AS1b</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>3% Chrysotile</td>
</tr>
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<td>CBR1303692Amended</td>
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</tbody>
</table>

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</thead>
<tbody>
<tr>
<td>904E-AS1c</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>904E-AS2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>5% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>904E-AS2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>904E-AS2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>4% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>904E-AS3a</td>
<td>1</td>
<td>brown sealant</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>52A-AS1a</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>52A-AS1b</td>
<td>1</td>
<td>blue surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>52A-AS1c</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>2% Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM LDEQ

**TDH 30-0370**

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<th>CA Labs Project #:</th>
<th>CBR1303692Amended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample #</td>
<td>analysts Physical Description of Subsample</td>
<td>Asbestos type / calibrated visual estimate percent</td>
<td>List of Affected Building Material Types</td>
</tr>
<tr>
<td>52A-AS2a</td>
<td>1 white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
<tr>
<td>52A-AS2b</td>
<td>1 white textured surfacing</td>
<td>trace Chrysotile</td>
<td></td>
</tr>
<tr>
<td>52A-AS2c</td>
<td>1 white textured surfacing</td>
<td>3% Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

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## Polarized Light Asbestiform Materials Characterization

### Customer Info:
- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- 100-2650 Queensview Dr.
- Ottawa, ON K2B 8H6
- **Phone #** 613-688-1899
- **Fax #** 613-225-7337

### Customer Project:
- **CCC6/ OTT-002124-A0**
- **Date:** 3/25/2013
- **Turnaround Time:** 5 Day
- **Samples Received:** 3/12/13 10:40 AM
- **Date Of Sampling:** N/A
- **Purchase Order #:**

### CA Labs Project #:
- **CBR1303692Amended**

### Analysis Method:
- **Interim** (40CFR Part 763 Appendix E to Subpart E) / **Improved** (EPA-600 / R-93/116)

### Preparation Method:
- HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

### Approved Signatories:
- **Chris Williams**
  - Senior Analyst
- **Alicia Stretz**
  - Laboratory Director

### Notes:
1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting florius percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze

### Sample Analysis Table:

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer</th>
<th>Analysts Physical Description of Subsample</th>
<th>Homogeneity US (Y/N)</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>Non-asbestos fiber type / percent</th>
<th>Non-fibrous type / percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>902H-AS1a</td>
<td>1</td>
<td>white compound</td>
<td>Y</td>
<td>None Detected</td>
<td>100% mi, ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>902H-AS1b</td>
<td>1</td>
<td>off-white compound</td>
<td>Y</td>
<td>2% Chrysotile</td>
<td>98% mi, ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>902H-AS1c</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>N</td>
<td>3% Chrysotile</td>
<td>97% bi, mi, ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>902H-AS2a</td>
<td>1</td>
<td>white textured surfacing</td>
<td>Y</td>
<td>3% Chrysotile</td>
<td>97% qu, pe, bi, ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>902H-AS2b</td>
<td>1</td>
<td>white textured surfacing</td>
<td>Y</td>
<td>4% Chrysotile</td>
<td>96% bi, qu, pe, ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>902H-AS2c</td>
<td>1</td>
<td>white textured surfacing</td>
<td>Y</td>
<td>3% Chrysotile</td>
<td>97% bi, qu, pe, ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>902H-AS3a</td>
<td>1</td>
<td>off-white surfaced black sealant</td>
<td>N</td>
<td>trace Chrysotile</td>
<td>5% ce</td>
<td>95% qu, ca, bi</td>
<td></td>
</tr>
</tbody>
</table>

---

6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested
### Polarized Light Asbestiform Materials Characterization

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<td>5% ce</td>
<td>95% qu, ca, bi</td>
<td></td>
</tr>
<tr>
<td>45H-AS1a</td>
<td>1</td>
<td>white surfaced tan compound</td>
<td>N</td>
<td>2% Chrysotile</td>
<td>98% mi, bi, ca</td>
<td></td>
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<tr>
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Analyst

Alicia Stretz
Senior Analyst

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Laboratory Director

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**Analysis Method:**
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<td>1</td>
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<td>1% Chrysotile</td>
<td>99% bi, mi, ca</td>
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</tr>
<tr>
<td>900-AS1e</td>
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<td></td>
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<td>100% qu, ma</td>
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Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM TDH 30-0370

LDEQ

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

Approved Signatories:

Chris Williams  
Analyst

Alicia Stretz  
Senior Analyst

Chris Williams  
Laboratory Director

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8. < 1% Result point counted positive
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Polarized Light Asbestiform Materials Characterization

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<thead>
<tr>
<th>Sample #</th>
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<th>Layer</th>
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<th>Homogeneity US (Y/N)</th>
<th>Asbestos type / calibrated visual estimate percent</th>
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**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

**Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

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4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze

**Approved Signatories:**

- Chris Williams
  Analyst

- Senior Analyst
  Alicia Stretz

- Laboratory Director
  Chris Williams

**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
### Polarized Light Asbestiform Materials Characterization

**Customer Info:**
- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- 100-2650 Queensview Dr.
  - Ottawa, ON K2B 8H6
- **Phone #** 613-688-1899
- **Fax #** 613-225-7337

**Customer Project:**
- CCC6/OTT-00211242-A0

**CA Labs Project #:** CBR1303692Amended

**Date:** 3/25/2013

**Turnaround Time:** 5 Day

**Samples Received:** 3/12/13 10:40 AM

**Purchase Order #:**

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**Analysis Method:**
- Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
- Identification of asbestos types by dispersion attaining / becke line method.

**Preparation Method:**
- HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

**Approved Signatories:**

- **LDEQ**
  - Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
  - Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
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7. Favorable scenario for water separation on vermiculite for possible analysis by another method
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## Polarized Light Asbestiform Materials Characterization

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- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- 100-2650 Queensview Dr.
- Ottawa, ON K2B 8H6
- **Phone #** 613-688-1899
- **Fax #** 613-225-7337

### Customer Project:
- **CCC6/ OTT-002124-A0**
- **Date:** 3/12/13
- **Turnaround Time:** 5 Day
- **Samples Received:** 3/12/13 10:40 AM
- **Date Of Sampling:** N/A
- **Purchase Order #:**

### CA Labs Project #:
- **CBR1303692Amended**
- **Date:** 3/25/2013

### Laboratory Director:
- **Chris Williams**

### CA Labs, L.L.C.:
- **1929 Old Denton Road**
- **Carrollton, TX 75006**
- **Phone 972-242-2754**
- **Fax 972-242-2798**

### CA Labs, L.L.C.:
- **12232 Industriplex, Suite 32**
- **Baton Rouge, LA 70809**
- **Phone 225-751-5632**
- **Fax 225-751-5634**

### Sample Details:

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<th>Non-fibrous type / percent</th>
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### Analysis Method:
- **LDEQ**
- **Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM**
- **TDH 30-0370**

### Approved Signatories:
- **Chris Williams**
  - Analyst
- **Alicia Stretz**
  - Senior Analyst
- **Chris Williams**
  - Laboratory Director

### Notes:
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- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- 100-2650 Queensview Dr.
- Ottawa, ON K2B 8H6
- **Phone #** 613-688-1899
- **Fax #** 613-225-7337

### Customer Project
- **CCC6/ OTT-00211242-A0**
- **Turnaround Time:** 5 Day
- **Date Of Sampling:** N/A
- **Purchase Order #:**

### CA Labs Project #:
- CBR1303692Amended
- **Date:** 3/25/2013
- **Samples Received:** 3/12/13 10:40 AM

### Sample Information Table

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### Analysis Details
- **Site:** Baton Rouge
- **Lab Code:** 200772-0 TEM/PLM
- **LDEQ Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
- **Preparation Method:** HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

### Approved Signatories
- Chris Williams (Analyst)
- Alicia Stretz (Senior Analyst)
- Chris Williams (Laboratory Director)

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- **Fax #** 613-225-7377

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- **Turnaround Time:** 5 Day
- **Purchase Order #:**

### CA Labs Project #:
- **CBR1303692Amended**

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**Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM**

**LDEQ**

**Analysis Method:** Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

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**Approved Signatories:**

- **CA Labs, L.L.C.**
  - 12232 Industriplex, Suite 32
  - Baton Rouge, LA 70809
  - Phone 225-751-5632
  - Fax 225-751-5634

- **Crisp Analytical, L.L.C.**
  - 1929 Old Denton Road
  - Carrollton, TX 75006
  - Phone 972-242-2754
  - Fax 972-242-2798

- **Chris Williams**
  - Analyst

- **Alicia Stretz**
  - Senior Analyst

- **Chris Williams**
  - Laboratory Director
### Polarized Light Asbestiform Materials Characterization

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<td>912E-AS3b</td>
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<td>1</td>
<td>Y</td>
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<td></td>
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<tr>
<td>912E-AS3c</td>
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<td>1</td>
<td>Y</td>
<td>None Detected</td>
<td></td>
<td>100% qu, ca, bi</td>
<td></td>
</tr>
</tbody>
</table>

---

**CA Labs, L.L.C.**

12232 Industriplex, Suite 32
Baton Rouge, LA  70809
Phone 225-751-5632
Fax 225-761-5694

---

**CA Labs**

Dedicated to Quality

1929 Old Denton Road
Carrollton, TX  75006
Phone 972-242-2754
Fax 972-242-2798

---

**Crisp Analytical, L.L.C.**

10-2650 Queensview Dr.
Ottawa, ON K2B 8H6
Phone 613-688-1899
Fax 613-225-7337

---

**exp Services, Inc.**

CCC6/OTT-00211242-A0

**Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM**

**LDEQ**

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

Approved Signatories:

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze
6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested
Polarized Light Asbestiform Materials Characterization

Customer Info: exp Services, Inc.
Attn: Shawn Doherty
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6

Customer Project: CCC6/OTT-00211242-A0
Date: 3/25/2013

Sample # 908E-AS1a 1 tan surfaced white compound N None Detected
Sample # 908E-AS1b 1 tan surfaced white compound N 2% Chrysotile
Sample # 908E-AS1c 1 white surfaced white compound N None Detected
Sample # 908E-AS2a 1 white textured surfacing Y 5% Chrysotile
Sample # 908E-AS2b 1 white textured surfacing Y None Detected
Sample # 908E-AS2c 1 white textured surfacing Y 3% Chrysotile
Sample # 904E-AS1a 1 white textured tan compound N 2% Chrysotile

Laboratory Director
Chris Williams

Approved Signatories:
Chris Williams
Senior Analyst
Alicia Stretz

CA Labs Project #: CBR1303692Amended
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / beckle line method.

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Homogeneity US (Y/N)</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>Non-asbestos fiber type / percent</th>
<th>Non-fibrous type / percent</th>
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</thead>
<tbody>
<tr>
<td>908E-AS1a</td>
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<td>N</td>
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<td>100% mi, bi, ca</td>
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<td>1</td>
<td>tan surfaced white compound</td>
<td>N</td>
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<td>98% mi, bi, ca</td>
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<tr>
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<td>None Detected</td>
<td>100% bi, mi, ca</td>
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<tr>
<td>908E-AS2a</td>
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<td>5% Chrysotile</td>
<td>95% qu, pe, bi, ca</td>
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<td>100% bi, qu, pe, ca</td>
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<td>N</td>
<td>2% Chrysotile</td>
<td>98% mi, bi, ca</td>
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</table>

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Not enough sample to analyze
5. Favorable scenario for water separation on Vermiculite for possible analysis by another method
6. Chrysotile in association with Fibrous Talc
7. Contamination suspected from other building materials
8. < 1%. Result point counted negative
9. 3/12/13 10:40 AM
10. TEM analysis suggested
### Polarized Light Asbestiform Materials Characterization

**Customer Info:**

- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- **100-2650 Queensview Dr., Ottawa, ON K2B 8H6**

**Phone #** : 613-688-1899  
**Fax #** : 613-225-7337  
**Date of Sampling:** 3/12/13

**Date:** 3/25/2013  
**Samples Received:** 3/12/13 10:40 AM  
**Date of Sampling:** N/A  
**Purchase Order #:** exp Services, Inc. CCC6/OTT-00211242-A0

---

**Laboratory Director:** Chris Williams  
**Analyst:** Alicia Stretz

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Comment</th>
<th>Layer #</th>
<th>Analysts Physical Description of Subsample</th>
<th>Homogeneous (Y/N)</th>
<th>Asbestos type / calibrated visual estimate percent</th>
<th>Non-asbestos fiber type / percent</th>
<th>Non-fibrous type / percent</th>
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<tr>
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<td>white surfaced tan compound</td>
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<td>98% bi, mi, ca</td>
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<td>white textured surfacing</td>
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<td>5% Chrysotile</td>
<td>95% qu, pe, bi, ca</td>
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<tr>
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<td>98% bi, mi, ca</td>
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<td>3% Chrysotile</td>
<td>97% qu, ca, bi</td>
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**Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM**  
**TDH 30-0370 LDEQ**

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

Approved Signatories:

- **Chris Williams**  
  **Analyst**
- **Alicia Stretz**  
  **Senior Analyst**
- **Chris Williams**  
  **Laboratory Director**

---

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers  
2. Fire Damage no significant fiber damages affecting fibrous percentages  
3. Actinolite in association with Vermiculite  
4. Layer not analyzed - attached to previous positive layer and contamination is suspected  
5. Not enough sample to analyze  
6. Anthophyllite in association with Fibrous Talc  
7. Contamination suspected from other building materials  
8. Favorable scenario for water separation on vermiculite for possible analysis by another method  
9. < 1% Result point counted positive  
10. TEM analysis suggested
### Polarized Light Asbestiform Materials Characterization

**Customer Info:**
- **Attn:** Shawn Doherty
- **exp Services, Inc.**
- 100-2650 Queensview Dr.
- Ottawa, ON K2B 6H6
- **Phone #** 613-688-1899
- **Fax #** 613-225-7337

**Customer Project:**
- **CCC6/OTT-00211242-A0**
- **Date:** 3/12/13 10:40 AM
- **Laboratory Director:** Chris Williams
- **Analyst:** Alicia Stretz

**Samples Received:** 3/12/13 10:40 AM

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<th>Non-fibrous type / percent</th>
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<td></td>
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<td></td>
<td>Positive-Stop</td>
<td></td>
<td></td>
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<tr>
<td>52A-AS1a</td>
<td>white surfaced tan compound</td>
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<td>2% Chrysotile</td>
<td></td>
<td>98% mi, bi, ca</td>
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<tr>
<td>52A-AS1c</td>
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<td>N</td>
<td>2% Chrysotile</td>
<td></td>
<td>98% bi, mi, ca</td>
<td></td>
<td></td>
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<tr>
<td>52A-AS2a</td>
<td>white textured surfaced</td>
<td>Y</td>
<td>3% Chrysotile</td>
<td></td>
<td>97% qu, pe, bi, ca</td>
<td></td>
<td></td>
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<tr>
<td>52A-AS2b</td>
<td>white textured surfaced</td>
<td>Y</td>
<td>trace Chrysotile</td>
<td></td>
<td>100% bi, mi, ca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52A-AS2c</td>
<td>white textured surfaced</td>
<td>Y</td>
<td>3% Chrysotile</td>
<td></td>
<td>97% bi, qu, pe, ca</td>
<td></td>
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</table>

**Analysis Method:**
- LDEQ
- Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)
- **Preparation Method:**
  - HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

**Non-asbestos Fiber Types:**
- ca - carbonate
- mi - mica
- fg - fiberglass
- os - cellulose
- bi - binder
- ot - other
- we - wollastilite
- br - brucite
- pr - pyroclastic
- ve - vermiculite
- pe - perlite
- ta - talc
- sy - synthetic
- ma - matrix
- qu - quartz
- pa - palygorskite (clay)
- ot - other
- sy - synthetic

**Approved Signatories:**
- Chris Williams
  - Analyist
- Alicia Stretz
  - Senior Analyst
- Chris Williams
  - Laboratory Director

**Notes:**
1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages affecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze
6. Anthophylite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1%. Result point counted positive
10. TEM analysis suggested
Polarized Light Asbestiform Materials Point Count

Laboratory Analysis Report - Point Count

Analysis and Method

Point counting was performed on a polarized light microscope with a calibrated reticle according to the revised NESHAP method of November 20, 1990 (Federal Register, V.55, N.224, 11/20/90). Original asbestos content of bulk materials was determined using procedures outlined in the interim method (40 CFR part 763, Appendix E to subpart E) and AHERA method (EPA-600/R-93/116). Samples were prepared using HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion staining / becke line method.

Qualifications

CA Labs is accredited by the National Voluntary Accreditation Program (NVLAP) for selected test methods for airborne fiber analysis (TEM), and for bulk asbestos fiber analysis (PLM). All analysts have a college degree in a natural science (geology, biology, or environmental science) or are recognized by a state professional board in one of these disciplines. Extensive in-house training programs are used to augment education background of the analyst. The group leader of polarized light has received supplemental McCrone Research training for asbestos identification. This report is not covered by the scope of NVLAP or AIHA accreditation. Analysis performed at CA Labs, LLC 12232 Industriplex, Suite 32 Baton Rouge, LA 70809.

Customer Info:

Attn: Shawn Doherty
exp Services, Inc.
100-2650 Queensview Dr.
Ottawa, ON K2B 8H6
Phone # 613-688-1899
Fax # 613-225-7337

CA Labs Project #:

CA Labs Project #: CBR1303692Amended

Date:

Date: 3/25/2013

Turnaround Time:

Turnaround Time: 5 Day

Samples Received:

Samples Received: 3/12/13 10:40 AM

Purchase Order #:

Purchase Order #: N/A

<table>
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<tr>
<th>Sample #</th>
<th>Layer</th>
<th>Analysts Physical Description of Subsample</th>
<th>Homogeneous</th>
<th>Asbestos Type</th>
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</thead>
<tbody>
<tr>
<td>902H-AS3a</td>
<td>1</td>
<td>off-white surfaced black sealant Y</td>
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<td></td>
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<tr>
<td>902H-AS3c</td>
<td>1</td>
<td>black sealant Y</td>
<td>trace Chrysotile</td>
<td></td>
</tr>
</tbody>
</table>

This report relates to the items tested. This report is not to be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any other agency of the federal government. This report may not be reproduced except in full without written permission from CA Labs. These results are submitted pursuant to CA Labs' current terms and sale, condition of sale, including the company's standard warranty and limitations of liability provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, CA Labs will store the samples for a period of ninety (90) days before discarding. A shipping or handling fee may be assessed for the return of any samples.

Approved Signatories:

Chris Williams
Analyst

Alicia Stretz
Senior Analyst

Chris Williams
Laboratory Director
### Polarized Light Asbestiform Materials Point Count

**Laboratory Analysis Report - Point Count**

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Layer</th>
<th>Analysts Physical #</th>
<th>Description of Subsample</th>
<th>Homo-geneous (Y/N)</th>
<th>Point Counted % / Asbestos Type</th>
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<tbody>
<tr>
<td>46G-AS2b</td>
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<tr>
<td>52A-AS2b</td>
<td>1</td>
<td></td>
<td>white textured surfacing</td>
<td>Y</td>
<td>trace Chrysotile</td>
</tr>
</tbody>
</table>

---

**Approved Signatories:**

- **Chris Williams**  
  Analyst
- **Senior Analyst Alicia Stretz**  
- **Laboratory Director Chris Williams**

---

**CA Labs, L.L.C.**  
12232 Industriplex, Suite 32  
Baton Rouge, LA  70809  
Phone 225-751-5632  
Fax 225-751-5634

---

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Carrollton, TX  75006  
Phone 972-242-2754  
Fax 972-242-2798

---

**Baton Rouge NVLAP Lab Code 200772-0 TEM/PLM**  
TDH 30-0370  
LDEQ

---

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Certificate of Analysis

exp Services Inc. (Ottawa)
100-2650 Queensview Dr.
Ottawa, ON K2B 8K2
Attn: Shawn Doherty

Client PO:
Project: OTT00211242-A0
Custody: 4786

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

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<th>Paracel ID</th>
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<td>1314152-03</td>
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Report Date: 4-Apr-2013
Order Date: 3-Apr-2013

Approved By:

Heather S.H. McGregor, BSc
Laboratory Director - Microbiology

Any use of these results implies your agreement that our total liability in connection with this work, however arising shall be limited to the amount paid by you for this work, and that our employees or agents shall not under circumstances be liable to you in connection with this work.
## Asbestos, PLM Visual Estimation  **MDL - 0.5%**

<table>
<thead>
<tr>
<th>Parcel I.D.</th>
<th>Sample Date</th>
<th>Layers Analyzed</th>
<th>Colour</th>
<th>Description</th>
<th>Asbestos Detected</th>
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<td>Client ID: 53P-PD-AS1a</td>
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<td>Non-Fibers</td>
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<td>not analyzed</td>
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**MMVF:** Man Made Vitreous Fibers: fiberglass, mineral wool, rockwool, glasswool

Analytes in bold indicate asbestos content which may include: Actinolite, Amosite, Anthophyllite, Chrysotile, Crocidolite and or Tremolite.

### Analysis Summary Table

<table>
<thead>
<tr>
<th>Analysis Description</th>
<th>Method Reference/Description</th>
<th>Lab Location</th>
<th>Analysis Date</th>
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<tbody>
<tr>
<td>Asbestos, PLM Visual Estimation</td>
<td>by EPA 600/R-93/116</td>
<td>Ottawa West Lab</td>
<td>4-Apr-13</td>
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</tbody>
</table>
**ASBESTOS ANALYSIS**

**Matrix Type:** A (Air)  
**Regulatory/Guideline Requirements:**  
**Required Analyses:**  
- [ ] PCM  
- [ ] PLM  
- [ ] PLM 400°C  
- [ ] PLM 1000°C  
- [ ] Chatfield

**Paracel Order Number:** 1314/52

<table>
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<tr>
<th>Sample ID</th>
<th>Matrix Description</th>
<th>Sampling Date</th>
<th>Air Volume (L)</th>
<th>Positive Step?</th>
<th>Is the Sample Layered?</th>
<th>If Yes, Describe Sample Layer(s) to be Analysed Separately</th>
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</table>

**Comments:**

**Method of Delivery:** Walk-in

**Received By (Print & Sign):**

**Date/Time:** APR 3, 2013 17:14

**Received by Driver/Depot:**

**Date/Time:** APR 3/13 5:12

**Received at Lab:**

**Date/Time:** APR 4/13 8:30

**Verified By:**

**Date/Time:** APR 4/13 8:42

---

**Chain of Custody (Asbestos) - Rev 0.0 April 2011**
Appendix E – Hazard Ranking Table
Classifications for Asbestos Hazard Potential (Decision Tree Display)

CONDITION OF ASBESTOS CONTAINING MATERIAL

SIGNIFICANT DAMAGE       DAMAGED       GOOD

HAZARD RANK N°1

POTENTIAL FOR DISTURBANCE

HIGH       MODERATE       LOW

HAZARD RANK N°2   HAZARD RANK N°3   HAZARD RANK N°4

HAZARD RANK N°5   HAZARD RANK N°6   HAZARD RANK N°7

NOTE:
SIGNIFICANT DAMAGE IS: 10% IF DAMAGE IS EVENLY DISTRIBUTED OR 25% IF DAMAGE IS LOCALIZED

Classifications for the level of Potential Disturbance

<table>
<thead>
<tr>
<th>POTENTIAL FOR DISTURBANCE</th>
<th>FREQUENCY OF</th>
<th>INFLUENCE OF</th>
<th>POTENTIAL FOR AIR EROSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH (i.e. potential for significant damage)</td>
<td>ANY HIGH VALUE FOR ONE MORE OF THESE FACTORS</td>
<td>ANY MODERATE VALUE FOR ONE MORE OF THESE FACTORS</td>
<td>ALL LOW VALUES</td>
</tr>
<tr>
<td>MODERATE (i.e. potential for damage)</td>
<td></td>
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<tr>
<td>LOW (i.e. little potential for damage)</td>
<td></td>
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</tbody>
</table>

exp Services Inc. www.exp.com
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, Ontario K2B 8H6

April 8, 2013 Deerpark Management Limited

CCC No. 6, 55 Sumac Street, Ottawa, Ontario
Appendix D: Work Permit Form
Work Permit

Permit Application for Performing Maintenance/Renovation Work

1. Exact location of area involved (including room name, room number location within room etc.):

___________________________________________________________________________
___________________________________________________________________________

2. Starting Date: _______________ Anticipated Completion Date: ______________________

3. *Approximate amount of asbestos present (linear metres, square metres, tank size, etc.):

___________________________________________________________________________
___________________________________________________________________________

4. *Asbestos control methods to be used (i.e., glovebag, HEPA vacuum, etc.):

___________________________________________________________________________
___________________________________________________________________________

5. *Protective equipment to be used (i.e., respirator, coveralls etc.):

___________________________________________________________________________
___________________________________________________________________________

6. Name and telephone number of supervisor:

___________________________________________________________________________
___________________________________________________________________________

To Be Filled Out By Asbestos Program Manager:

Permit Accepted: ____________________ Permit Rejected: ____________________

Signed: __________________________ Print: __________________________

Permit Number: _______________________

Emergency Contact: ______________________

Please return this form to*:

___________________________________________________________________________
___________________________________________________________________________

*Note: these items may have to be filled out by Asbestos Program Manager
Appendix E:
Fibre Release Episode Report
Fibre Release Report

Fibre Release Episode Report

1. Exact location where fibre release episode occurred (including room name, room number location within room etc.):

___________________________________________________________________________

2. The release was reported by ________________________________________________

on: ____________________________   (Date and Time)

3. Describe the episode:

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

4. The asbestos containing material was ____ was not ____cleaned up according to approved procedures. Describe the cleanup:

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

Signed: _____________________________ Date: _________________________

(Asbestos Program Manager)
Appendix F: Asbestos Management Program Receipt Form
**Employee O & M Manual List**

I hereby acknowledge that I have reviewed a copy of the Manual titled “Asbestos Management Plan, CCC #6, 55 Sumac Street, Ottawa, Ontario”, on the date noted next to my signature. I further acknowledge that I shall abide by its contents.

<table>
<thead>
<tr>
<th>Name</th>
<th>Date Signed Out</th>
<th>Date Returned</th>
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</table>

April 2013
Appendix G: Field Survey Update Form
Field Survey Update

Re-Assessment of Asbestos Containing Materials

1. Location of asbestos containing material (including unit address, room name, location within room etc.):

___________________________________________________________________________
___________________________________________________________________________

2. Type of asbestos containing material(s):

   Sealant Material
   Fire Stop Material
   Floor Tiles
   Drywall Compound
   Other (describe):

___________________________________________________________________________
___________________________________________________________________________

3. Abatement Status:

The material has been:

   encapsulated _____  enclosed_____  neither _____

4. Assessment:
   a) Evidence of physical damage ________________________________

   b) Evidence of water damage ________________________________

   c) Evidence of delaminating or other deterioration __________________________

5. The asbestos containing material was _____ was not ____ cleaned up according to approved procedures. Describe the cleanup:

___________________________________________________________________________
___________________________________________________________________________

Signed: _____________________________ Date: _________________________
(Asbestos Program Manager)