

Asbestos Management Plan (AMP) Chignecto-Central Adult High School (CCAHS Elmsdale), 224 Highway 214, Elmsdale, NS

Final Report



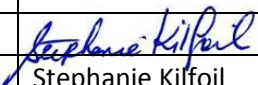
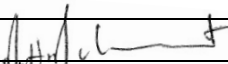

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Prepared for:



Prepared by:



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Draft Report	Stephanie Kilfoil	2019/09/18	Matt McClement
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October 16, 2019

Mr. Michael Hatfield
Procurement Officer
Municipality of East Hants
Email: mhatfield@easthants.ca

Dear Mr. Hatfield:

RE: *Asbestos Management Plan – Final Report*
Chignecto Central Adult High School Elmsdale, 224 Highway 214, Elmsdale, Nova Scotia

CBCL Limited is pleased to provide the Asbestos Management Plan Final Report for the Chignecto Central Adult High School located at 224 Highway 214, Elmsdale, Nova Scotia.

We look forward to any comments or questions you may have on this report.

Yours very truly,

CBCL Limited



Stephanie Kilfoil, B.Sc., P.Eng.
Project Manager
Telephone: (506) 633-6650
E-mail: skilfoil@cbcl.ca

Project No: 181255.01

CenterBeam Place
14 King Street, Suite 420
PO Box 20040
Saint John, New Brunswick
Canada E2L 5B2

Telephone: 506 633 6650
Fax: 506 633 6659
E-mail: info@cbcl.ca
www.cbcl.ca

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GLOSSARY OF TERMS

Abatement

“Abatement” shall mean any and all procedures physically taken to control fibre release from asbestos-containing materials. This includes removal, encapsulation, enclosure and repair.

Abatement activities

“Abatement activities” shall mean all activities from the initiation of work area preparation through successful clearance air monitoring performed at the conclusion of an asbestos project a minor project.

Aggressive sampling

“Aggressive sampling” shall mean a method of sampling in which the individual collecting the air sample creates activity by the use of mechanical equipment during the sampling period to stir up settled dust and to simulate activity in that area of the building.

AHERA

“AHERA” shall mean the Asbestos Hazard Emergency Regulation Act as created by the United States Environmental Protection Agency.

AIHA

“AIHA” shall mean the American Industrial Hygiene Association.

Airlock

“Airlock” shall mean a system for permitting entrance and exit while restricting air movement between a contaminated area and an uncontaminated area. It consists of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow through contamination.

Air sampling

“Air sampling” shall mean the process of measuring the fibre content of known volume of air collected during a specific period of time. The procedure utilized for asbestos follow the National Institute of Occupational Safety and Health Analytical Method 7400 or the provisional transmission electron microscopy methods developed by the USEPA and /or National Institute of Science and Technology which are utilized for lower delectability and specific fibre identification.

Asbestos

“Asbestos” shall mean any hydrated mineral silicate separable into commercially usable fibres, included but not limited to chrysolite (serpentine), amosite (cuming-tonite-grunerite), crocidolite (riebeckite), tremolite, anthrophyllite and actinolite.

Asbestos containing material

“Asbestos Containing Material” (ACM) shall mean asbestos or any material containing more than one percent asbestos by dry weight.

Asbestos containing waste material

“Asbestos containing waste material” shall mean asbestos-containing material or asbestos contaminated objects requiring disposal.

Asbestos contaminated objects

“Asbestos contaminated objects” shall mean any objects, which have been contaminated by asbestos or asbestos containing material.

Asbestos handler

“Asbestos handler” shall mean an individual who disturbs, removes, encapsulates, repairs, or encloses friable asbestos material.

Asbestos handler supervisor

“Asbestos handler supervisor” shall mean an individual certified who supervises the handlers during an asbestos project and ensures that proper asbestos abatement procedures as well as individual safety procedures are being adhered to.

Asbestos Inspection Report

“Asbestos Inspection Report” shall mean a report on the condition of a building or structure in relation to the presence and condition of asbestos therein.

Asbestos Surveyor

“Asbestos Surveyor” shall mean an individual certified by AHERA as having satisfactorily demonstrated his or her ability to identify the presence and evaluate the condition of asbestos in a building or structure.

Asbestos Project

“Asbestos Project” shall mean any form of work performed in connection with the alteration , renovation, modification or demolition of a building of structure which will disturb (e.g., remove, enclose, encapsulate) friable asbestos containing material.

ASTM

“ASTM” shall mean the American Society for Testing and Materials.

Authorized Visitor

“Authorized Visitor” shall mean the building owner and his/her representative, and any representative of a regulatory or other agency having jurisdiction over the project.

Boiler room equipment

“Boiler room equipment” shall mean of “fuel-burning equipment” shall mean equipment designed to burn fuel for the purpose of generating hot water, steam, and/or heat, including all ancillary equipment and associated piping. For boiler rooms other than those located in electric and steam utility generating stations, the ancillary equipment and associated piping shall be limited to that within the room containing the main equipment; or where there is no such room, located on the floor where the main equipment is located.

Clean Room

“Clean Room” shall mean an uncontaminated area or room, which is part of the worker decontamination enclosure system with provisions for storage of workers’ street clothes and protective equipment.

Clearance air monitoring

“Clearance air monitoring” shall mean the employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of residual fibres, and shall be performed as the final abatement activity.

Contractor

“Contractor” shall mean a public authority or any other governmental agency or instrumentality thereof, self-employed person, company, unincorporated association, firm, partnership or corporation and any owner or operator thereof, which engages in an asbestos project or employs persons engaged in an asbestos project.

Curtained doorway

“Curtained doorway” shall mean a device, which consists of at least three overlapping sheets of plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to ensure that the sheets hang straight and maintain a seal over the doorway when not in use.

Decontamination enclosure system

“Decontamination enclosure system” shall mean a series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of workers, materials, waste containers and equipment.

Dioctyl Phthalate(DOP) Testing

“DOP testing” shall mean the process for testing the effectiveness of HEPA filtered equipment at removing asbestos fibres from the air. The test requires introducing a stream of aerosol (dioctyl phthalate) particles (0.3 um or larger) on the upstream side of an operating HEPA filter and measuring the downstream side of the filter with a particle detector.

Disturb

“Disturb” shall mean any action taken, which may alter, change, or stir such; such as not limited to the removal, encapsulation, enclosure or repair of asbestos-containing material.

Encapsulant (sealant) or encapsulating agent

“Encapsulant (sealant) or encapsulating agent” shall mean pigmented (non-transparent) liquid material which can be applied to asbestos –containing material of the bare surfaces exposed after an abatement which temporarily controls the possible release of asbestos fibres from the material or surface either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

Encapsulation

“Encapsulation” shall mean the coating or spraying of asbestos containing material or the bar surfaces exposed after abatement with a pigmented (non-transparent) sealant.

Enclosure

“Enclosure” shall mean the construction of airtight walls and ceilings between the ACM and the facility environment, or around surfaces coated with ACM, or any other appropriate procedure, which prevents the release of asbestos fibres.

EPA

“EPA” or “USEPA” shall mean the United States Environmental Protection Agency.

Equipment Room

“Equipment Room” shall mean a contaminated area or room, which is part of the worker decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.

Fibre

“Fibre” shall mean an acicular single crystal or a similarly elongated polycrystalline aggregate which displays some resemblance to organic fibres by having such properties as flexibility, high aspect ratio, silky luster, axial lineation, and others and which has attained its shape primarily through growth rather than cleavage.

Fixed object

“Fixed object” shall mean a unit of equipment or furniture in the work area, which cannot be removed from the work area.

Friable asbestos material

“Friable asbestos material” shall mean any asbestos or any ACM that can be crumbled, pulverized or reduced to powder when dry, by hand or other mechanical pressure.

Glovebag technique

“Glovebag technique” shall mean a method for removing friable asbestos-containing material from heating, ventilation and air conditioning (HVAC) ducts, short piping runs, valves, joints, elbows, and other nonplanar surfaces. The glovebag assembly is a manufactured device consisting of a large bag (constructed of at least 6-mil transparent plastic), two inward-projecting long sleeves gloves, one inward-projecting water wand sleeve, an internal tool pouch, and an attached, labelled receptacle for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all asbestos fibres released during the removal process.

HEPA filter

“HEPA filter” shall mean a high efficiency particulate air filter capable of trapping and retaining 99.97 percent of particles including asbestos fibres greater than 0.3 micrometers mass median aerodynamic equivalent diameter.

HEPA vacuum equipment

“HEPA vacuum equipment” shall mean vacuuming equipment with a HEPA filter.

Holding area

“Holding area” shall mean a chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area.

Homogeneous work area

“Homogeneous work area” shall mean a portion of the work area, which contains one type of asbestos-containing material and/or one type of abatement is used.

Isolation barrier

“Isolation barrier” shall mean the construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off the work place from surrounding areas and to contain asbestos fibres in the work area.

Large asbestos project

“Large asbestos project” shall mean an asbestos project involving the disturbance (e.g., removal, enclosure, and encapsulation) of a significant amount (greater than one square foot) of friable asbestos-containing material.

Log

“Log” shall mean an official record of all activities that occurred during the project and it shall identify the building owner, agent, contractor and workers and other pertinent information (e.g. equipment malfunctions, contamination beyond the work area, etc.)

Minor violation

“Minor violation” shall mean any action on the job performance or lack of performance that may place the worker at risk.

Movable object

“Movable object” shall mean a unit equipment or furniture in the work area, which can be removed from the work area.

Negative air pressure

“Negative air pressure” shall mean a portable local exhaust system equipped with HEPA filtration. The system shall be capable of creating a negative pressure differential between the outside of the work area.

NIOSH

“NIOSH” shall mean the National Institute for Occupational Safety and Health CDC-NIOSH.

Occupied area

“Occupied area” shall mean an area of the work site where abatement is not taking place and where personnel or occupants normally function or where workers are not required to use personal protective equipment.

Outside air

“Outside air” shall mean the air outside the work place.

Person

“Person” shall mean any individual, partnership, company, corporation, association, firm, organisation, governmental agency, administration or department, or any other group of individuals or any officer of employee thereof.

Personal air monitoring

“Personal air monitoring” shall mean a method used to determine employees’ exposure to airborne fibres. The sample is collected outside the respirator in the worker’s breathing zone. (Also called occupational air sampling)

Personal protective equipment

“Personal protective equipment” (PPE) shall mean appropriate protective clothing, gloves, eye protection, footwear, headgear and respirators.

Phase contrast microscopy

“Phase contrast microscopy” (PCM) shall mean the measurement protocol for the assessment of the fibre content of air. (NIOSH Method 7001)

Plasticize

“Plasticize” shall mean to cover floors and walls with plastic sheeting as herein specified or by using spray plastics.

Polarized light microscopy

“Polarized light microscopy” (PLM) shall mean the measurement protocol for the assessment of the asbestos content of bulk materials.

Qualitative fit test

“Qualitative fit test” shall mean the individual test subject’s responding (either voluntarily or involuntarily) to a chemical challenge outside the respirator face piece. Three of the most popular methods include:

1. Irritant smoke test;
2. Odorous vapour test; and
3. Taste test.

Quantitative fit test

“Quantitative fit test” shall mean exposing the respirator wearer to a test atmosphere containing an easily detectable, non-toxic aerosol, vapour or gas as the test agent. Instrumentation, which samples the test atmosphere and the air inside the face piece of the respirator, is used to measure quantitatively the leakage into the respirator. There are a number of test atmospheres, test agents and exercises to perform during the tests.

Removal

“Removal” shall mean the stripping of any asbestos-containing materials from surfaces or components of a facility of taking out structural components in accordance with WCB regulation.

Repair

“Repair” shall mean corrective action using specified work practices e.g. glovebag, plastic tent procedures, etc. to minimize the likelihood of fibre release from minimally damaged areas of ACM.

Replacement material

“Replacement material” shall mean any material used to replace ACM that contains no asbestos.

Shift

“Shift” shall mean a worker’s, or simultaneous group of workers’ complete daily term of work.

Shower room

“Shower room” shall mean a room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold running water controllable at the tap and arranged for complete showering during decontamination.

Small asbestos project

“Small asbestos project” shall mean an asbestos project involving the disturbance (e.g., removal, enclosure, and encapsulation) of less than one square feet of friable asbestos-containing material.

Staging area

“Staging area” shall mean the work area near the waste transfer airlock where containerised asbestos waste has been placed prior to removal from the work area.

Strip

“Strip” shall mean to remove friable asbestos materials from any part of the facility.

Surface barrier

“Surface barrier” shall mean the plasticizing of walls, floors and fixed objects within the work area to prevent contamination from subsequent work.

Surfactant

“Surfactant” shall mean a chemical wetting agent added to water to improve penetration.

Transmission electron microscopy (TEM)

“Transmission electron microscopy (TEM)” shall mean the measurement protocol for the assessment of the asbestos fibre content of air. (Interim transmission Electron Microscopy Analytical Methods – 40 CFR Part 763, Subpart E, Appendix A)

Visible emissions

“Visible emissions” shall mean any emissions containing particulate material that are visually detectable without the aid of instruments.

Washroom

“Washroom” shall mean a room between the work area and the holding area in the equipment decontamination enclosure system where equipment and waste containers are wet cleaned and/or HEPA vacuumed prior to disposal.

Waste decontamination enclosure system

“Waste decontamination enclosure system” shall mean the decontamination enclosure system designated for the controlled transfer of materials and equipment, consisting of a washroom and a holding area.

Wet cleaning

“Wet cleaning” shall mean the removal of asbestos fibres from building surfaces and objects by using cloths, mops or other cleaning tools, which have been dampened with water.

Wet methods

“Wet methods” shall mean the use of amended water or removal encapsulants to minimize the generation of fibres during ACM disturbance.

Work area

“Work area” shall mean designated rooms, spaces or areas of the building or structure where asbestos abatement activities take place. For glovebag procedures, the work area shall also include the areas contiguous to where the procedure takes place.

Worker

“Worker” shall mean asbestos handler and/or asbestos handler supervisor.

Worker decontamination enclosure system

“Worker decontamination enclosure system” shall mean that portion of a decontamination enclosure system designed for controlled passage of workers and other individuals and authorized visitors, consisting of a clean room, a shower room, and an equipment room separate from each other and from work area by airlocks and curtained doorways.

Work site

“Work site” shall mean premises where asbestos abatement activity is taking place, and may be composed of one or more work areas.

CHAPTER 1 INTRODUCTION

CBCL Limited (CBCL) was contracted by the Municipality of East Hants to develop an Asbestos Management Plan (AMP) following a recently completed Hazardous Building Materials Survey at the Chignecto Central Adult High School (CCAHS) in Elmsdale, Nova Scotia, Nova Scotia, which identified the presence of asbestos containing materials (ACMs) in association with the building.

The purpose of this AMP is to outline the procedural controls, personal protective equipment (PPE), specific work procedures and training requirements of the CCAHS, building tenants and contractors in the management of ACMs at the CCAHS. The AMP has been developed to meet the requirements of the Nova Scotia Occupational Health and Safety Act and the Nova Scotia Department of Labour and Advanced Education's document titled *A Guide to Assessment and Management of Asbestos in the Workplace*, which states that where ACMs are present in a workplace, and any immediate risk has been addressed, the owner of the building must ensure that a written AMP is developed and maintained as long as ACMs are present within the workplace.

The following AMP has been developed to ensure that ACMs are adequately maintained, controlled and handled so as to protect workers and building occupants, in compliance with regulatory and policy requirements. This AMP applies to routine work during which an employee may encounter ACMs as well as during work undertaken to repair or to remove ACMs.

CHAPTER 2 **ASBESTOS OVERVIEW**

2.1 Definition of Asbestos Containing Material

An asbestos material is defined by the Nova Scotia Code of Practice: “Nova Scotia Department of Labour and Advanced Education, 2013, *Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace*” as a material containing greater than 0.5%. Asbestos is a general term which is used to describe a group of fibrous mineral silicates.

2.2 Types of Asbestos

The name asbestos comes from the Greek word meaning “indestructible” and is a generic term given to a group of naturally occurring fibrous hydrated mineral silicates that have a unique crystalline structure. Asbestos is mined primarily from open pits in many countries including Canada, Russia, United States, South Africa and Australia. There are over 30 different varieties of asbestos in existence but only a few have commercial importance. Of these there are two main groups; the serpentines and the amphiboles.

2.2.1 Serpentine

The serpentine group includes only chrysotile or “white” asbestos. Chrysotile fibres have hollow centres, like a scroll of paper and are curly or wavy in physical appearance, under microscopic analysis. Bundles of chrysotile fibres easily fracture along their length into smaller bundles and individual fibres. Individual fibres cannot be easily seen under microscopic analysis. The ends of the smaller bundles of fibres may look like unravelled rope.

2.2.2 Amphiboles

Amphiboles are distinguished through their chain-like structures and chemical composition. Amphiboles include amosite (brown asbestos), crocidolite (blue asbestos) and tremolite. Amosite and crocidolite fibres are straight and needle like, while tremolite fibres are short and stubby.

2.3 Asbestos Applications

The qualities of asbestos that promoted its use in construction include its fire resistance, tensile strength, durability, flexibility and resistance to heat, wear and corrosion.

Asbestos has many building applications, but most notably is its use as an insulator against heat, cold, electricity and noise. Examples of applications of asbestos include its use as sprayed insulation and fireproofing; thermal insulator for pipes, boilers, and incandescent light reflectors; acoustical and decorative applications in ceiling tiles, building walls and ceilings; and in building materials such as floor tiles, wallboard, roof shingles and felts, gaskets, caulking and wall and ceiling plasters.

2.4 Classification: Friable and Non-Friable

Asbestos containing materials are classified as being friable or non-friable.

Friable means a material that, when dry, can easily be crumbled, pulverized or powdered by hand.

Friable materials containing asbestos may appear:

- Fluffy or spongy (always applied by spraying);
- Irregular, soft surface (usually applied by spraying); or,
- Textured, dense fairly firm surface (usually applied by trowelling).

Examples of friable asbestos containing materials include fireproofing, mechanical insulation, and ceiling tiles.

Non-friable means a material that, when dry, cannot be easily crumbled, pulverized or powdered by hand. Examples of non-friable asbestos containing materials include:

- Floor tiles, roofing, mastics and putties.

Potentially friable means a material that is considered non-friable in place but should be managed as a friable material when removed (e.g. drywall compound and plaster).

2.5 Health Effects

According to Health Canada, asbestos poses health risks only when fibres are present in the air that people then inhale.

Exposure to asbestos can affect a person depending on one or multiple factors below:

- The concentration of asbestos fibres in the air;
- How long the exposure to asbestos lasted;
- How often a person was exposed to asbestos;
- The size of the asbestos fibres inhaled;
- The amount of time since the initial exposure to asbestos.

Inhalation of asbestos fibres can lead to illnesses such as asbestosis, mesothelioma and lung cancer. It has been shown that smoking, combined with inhaled asbestos, greatly increases the risk of lung cancer. The link between exposure to asbestos and other types of cancers is less clear.

According to the Canadian Centre for Occupational Health and Safety:

- Asbestosis is a lung disease that occurs when asbestos fibres are inhaled. It is a chronic disease with slow onset that usually requires several years of exposure. The development and progression of asbestosis varies from individual to individual. It is often slow with little changes over five, ten or more years. Many cases do not advance after diagnosis. It may, however, be quicker in some individuals than in others due to different conditions of past dust exposure. Asbestosis is characterized by pulmonary fibrosis (the formation of scar-like tissue). Shortness of breath is the most common symptom;
- Mesothelioma is a cancer of the pleural and peritoneal cells (lining of the lung and abdominal cavity). Patients with pleural mesothelioma experience chest and shoulder pain and dry cough is frequent. As the cancer progresses and the tumor grows bigger, weight loss, weakness, and fever may also occur. The time between the initial exposure to asbestos and clinical signs of the disease is difficult to define because for mesothelioma the range is quite wide and the disease is rarely seen less than 10 years from the time of the first exposure and it may occur even after 40 years;
- Asbestos can cause lung cancer. Lung cancer takes many years to develop, but changes in the lung can begin almost as soon as a person is exposed to asbestos. Lung cancer usually does not cause symptoms in the early stages. When symptoms occur the cancer is often advanced. Symptoms of lung cancer include chronic cough, weight loss, shortness of breath, fever, and chest pain.

2.6 Legislative Requirements

2.6.1 Canadian Occupational Safety and Health Regulation

COSH Regulation Part X, Control of Hazards: Section 10.19 (1) states the following:

An employee shall be kept free from exposure to a concentration of:

- An airborne chemical agent, other than airborne grain dust, airborne flour dust and airborne asbestos fibres, in excess of the value for that chemical agent adopted by the American Conference of Governmental Industrial Hygienists, in its publication entitled Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), as amended from time to time;
- An employer shall ensure that an employee's exposure to a concentration of airborne asbestos fibres is as close to zero as is reasonably practicable, but in any event the employer shall ensure that the concentration is not in excess of the value for airborne asbestos fibres adopted by the American Conference of Governmental Industrial Hygienists in its publication entitled Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), as amended from time to time.

The American Conference of Governmental Industrial Hygienists 2019 Threshold Limit Values (TLV's) for asbestos is 0.1 f/cc.

2.6.2 Provincial Occupational Health and Safety Regulation

Asbestos is regulated provincially under the Occupational Health and Safety Regulations. The Nova Scotia Department of Labour and Advanced Education has developed guidelines and codes of

practice, pursuant to the *Occupational Health and Safety Act*, for the assessment, management, maintenance, handling and removal of ACMs. The following guidelines and codes of practices are relevant:

- Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace;
- Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material.

The Nova Scotia Asbestos Waste Management Regulations, made under Section 84 of the Environment Act, describes the handling, packaging, shipping and disposal procedures for asbestos waste.

2.6.3 Transportation and Disposal

The Transportation of Dangerous Goods Regulations (TDG) classifies asbestos (chrysotile, actinolite, amosite, anthophyllite, crocidolite, tremolite) as hazardous substances. TDG regulations apply when asbestos is not fixed in a natural or artificial binder material or included in a manufactured product.

The Nova Scotia Asbestos Waste Management Regulations, made under Section 84 of the Environment Act, describes the handling, packaging, shipping and disposal procedures for asbestos waste.

CHAPTER 3 **ROLES AND RESPONSIBILITIES**

The following sections describe key roles and associated responsibilities recommended for key personnel to ensure appropriate implementation and management of the AMP.

3.1 CCAHS Leadership

CCAHS leadership will:

- Ensure that a written Asbestos Management Plan:
 - Is developed, implemented and maintained as long as an asbestos containing material is present in the workplace; and,
 - Lists the areas of priority, and measures that will be taken to prevent asbestos exposure in the workplace (such as removal, enclosure, encapsulation, or use of a physical barrier to prevent unauthorized individuals from accessing the area where an asbestos containing material exists);
- Maintain and update the AMP as necessary;

3.2 CCAHS Building Supervisor

The CCAHS Building Supervisor will:

- Maintain and update an inventory of ACMs at the CCAHS;
- Ensure ACMs are re-inspected and assessed regularly for signs of damage that could result in a release of asbestos fibres;
- Maintain written records of communication, training, and inspections for a period of two years or for as long as they are relevant.
- Provide copies of the asbestos inventory to building staff and tenants upon request;
- Report and document any asbestos related emergencies to CCAHS leadership;
- Respond to questions and requests for asbestos related information.
- Consult the most recent version of the OHS Division document entitled “Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material” where the removal of a friable asbestos containing material is planned;
- Inform any employers whose workplace is in the building, and any contractors or constructors, for which the owner has responsibility, of the following:
 - Locations where the potential for asbestos exposure exists in the workplace;
 - Potential health risks posed by asbestos exposure;

- Restrictions or precautions that must be followed to minimize the risk associated with the presence of asbestos containing materials in the workplace; and,
- Reporting procedures to be followed in the event that a material that is believed to contain asbestos is damaged;
- Ensure that any contractor or self-employed person who the CCAHS Leadership requires to work in the building is trained in safe work procedures for activities that may require contact with asbestos containing materials, including the proper selection, use and care of required personal protective equipment, the use of isolation techniques as needed, and the use of the appropriate equipment for the work to be done;
- Ensure persons who perform work activities in proximity to or who may disturb ACMs, act in accordance with the provisions of this AMP and applicable legislation including that:
 - Workers are adequately trained and instructed on an on-going basis to ensure compliance with applicable legislation;
 - Workers fill out and update an Asbestos Work Notice Form such as the one provided in Appendix C. The Building Supervisor will review the completed Asbestos Work Notice Form, project description and specific project requirements. Based on this information, the Building Supervisor will assess the type of Asbestos Operation (i.e., Minimum, Intermediate, Maximum Precautions) required to facilitate the project requirements, if necessary;
 - Direction is provided on the type of asbestos operation required and provide approval to commence with asbestos work;
 - Inform other key personnel within CCAHS and within CCAHS leadership of work to be carried out and the scope of work;
 - On completion of asbestos work, ensure that a complete a visual inspection of the work area is completed and provide approval of the completion of asbestos work by attaching his/her signature on the Asbestos Work Notice Form;
 - Inform key personnel once asbestos removal is completed and an “all clear” is given;
 - Post the Asbestos Work Notice Form at each entry into the work area for the duration of the work and should be kept on record;
- Ensure outside contractors, who work in the vicinity of identified ACMs, sign a Contractor Work Notice Form prior to conducting any work that may possibly disturb the ACMs. A Contractor Work Notice Form has been included in Appendix C.

3.3 Building Tenants

Building tenants will:

- Be familiar with the requirements of the AMP as it pertains to their activities;
- Report to Building Supervisor any damage or disturbance of ACMs;
- Avoid any activities that could damage or disturb ACMs.

3.4 Custodial Staff

Custodial staff will:

- Be familiar with the requirements of the AMP as it pertains to their activities;
- Report to Building Supervisor any damage or disturbance of ACMs;

- Avoid any activities that could damage or disturb ACMs;
- Ensure together with the Building Supervisor that asbestos awareness training has been provided to staff as required to ensure asbestos containing materials are not inadvertently disturbed by custodial activity;
- Provide documentation to the Building Supervisor that training has been completed.

CHAPTER 4 **EDUCATION AND TRAINING**

To ensure the effectiveness of the overall management of asbestos, it is crucial for all those who work in asbestos containing facilities, or those who may come into contact with asbestos, to participate in some form of asbestos awareness training. The Building Supervisor shall ensure that the following groups are included in formal asbestos awareness training sessions:

1. Personnel working in areas of the building with ACMs present.
2. Facility Management Personnel.
3. Custodial Staff.
4. Contractors.

Content of the awareness training sessions may vary depending on the specific needs of the participants involved. Typical awareness and management training requirements will consist of instruction in:

1. General introduction to asbestos including:
 - a. History and health effects.
 - b. Friable versus non-friable versus potentially friable.
 - c. Examples of ACMs.
2. Applicable regulations.
3. Overview of the AMP and asbestos survey report(s) including the inventory of ACMs.
4. Methods of labelling and identifying known and suspected asbestos containing materials.
5. Reporting procedures for any release of suspected ACMs.
6. Emergency procedures in the event of a release of ACMs.
7. An overview of the known and suspected locations of ACMs.
8. Classification of asbestos work.
9. Worker protection including:
 - a. PPE.
 - b. Respirator use, care and fit testing; and
10. Asbestos control options.

Upon completion of the training session, the attendees should be provided with copies of the training manual. The Building Supervisor will ensure that procedures are in place to maintain a list

of trained workers with the date and type of training. The Building Supervisor will maintain training records.

An abbreviated asbestos training session, providing a brief overview of the above, should be provided to workers who may work in the vicinity of ACMs but who are unlikely to disturb it (e.g. cleaning staff, teaching staff, etc.). Training should focus on the identification of ACMs and should identify the person who must be notified should damaged ACMs be observed.

CHAPTER 5 **RECORDS AND DOCUMENTATION**

The Building Supervisor shall ensure that the following information and documents are maintained as a part of this AMP. This information shall be kept up to date for the CCAHS building as long as ACMs are present in the building. Each employer whose workplace is in the building must be informed of the presence of ACMs in relevant areas of the building and be provided with a reasonable opportunity to review the inventory. Documents shall be dated and cross-referenced to, at a minimum, the referenced room number.

5.1 ACM Inspection

Each time that periodic surveillance is performed to inspect the condition of an ACM, the following shall be recorded:

- Name of each person/company of the person(s) performing the activity;
- Date of the inspection;
- Any changes in the condition of the asbestos containing materials. Areas of deteriorated ACMs must be specifically noted, including those areas which may have previously been noted as being in deteriorated condition.

Appendix B provides information for the evaluation of asbestos containing materials and their accessibility.

5.2 Preventative Measures

When preventative measures for ACMs present in the building are implemented, a detailed written description of each preventative measure or response action taken shall be recorded, including:

- Name of each person/company of the person(s) performing the activity;
- Date measures were taken;
- Location where the measure was taken;
- ACMs affected;
- Reasons for selection of the measure or action;
- Methods used;
- Start and completion dates of the work;
- Name and location of the disposal site (if removal was conducted).

5.3 Maintenance Activities

Each time that ACM maintenance activities are performed on building materials that contain asbestos the following shall be recorded:

- Name of each person/company of the person(s) performing the activity;
- Date measures were taken;
- Location where the activity occurred;
- ACMs affected;
- Description of the activity and the preventative measures used, and,
- Name and location of the storage or disposal site (if ACMs are removed).

5.4 Major Asbestos Activity

Each time that a major asbestos activity (i.e., removal, encapsulation, enclosure) is performed, the following shall be recorded:

- Name of each person/company of the person(s) performing the activity;
- Start and completion dates of the activity;
- ACMs affected;
- Locations where such activity occurred;
- Description of the activity, level of precautions including preventative measures used, and,
- Name and location of the storage or disposal site.

5.5 Control of Friable Asbestos

In any case of a possible release of asbestos fibres, the following shall be recorded:

- Name of each person/company of the person(s) performing the control activity;
- The date and location of the release episode;
- The method of control;
- Preventative measures or response actions taken;
- Name and location of the storage or disposal site shall be documented.

5.6 Air Monitoring during Asbestos Abatement

Following the collection of asbestos air samples, a table showing analytical results compared to applicable guidelines is to be submitted to the Building Supervisor together with the laboratory certificate and chain of custody and a description of the location (room number) and reason for the collection of the air sample along with any specific recommendations as a result of the air sample results.

5.7 Waste Manifests

All waste manifest forms for the transportation and disposal of asbestos material shall be kept on file. All correspondence regarding ACMs with any federal, provincial or municipal agencies regarding asbestos shall be kept on file.

5.8 Training Records

Training records for all participants in the management of asbestos must be kept on file by the Building Supervisor.

CHAPTER 6 **ASBESTOS MANAGEMENT OPTIONS**

As long as asbestos remains in a building, a management program is to be implemented to ensure that asbestos is not released into the working environment due to maintenance, renovation or repair work carried out by maintenance personnel or contractors or by the natural deterioration of the condition of the ACM.

ACMs in good condition may remain in place as they do not present an exposure risk. ACM in deteriorating condition present a potential exposure risk to building occupants and therefore should be appropriately repaired or removed by a qualified contractor in accordance with applicable guidelines and regulations. To ensure the asbestos containing materials are not subject to uncontrolled fibre release, an essential component of an AMP is the identification and assessment of all suspect ACMs. Appendix B provides information for the evaluation of asbestos containing materials, their accessibility and associated recommended actions.

There are four basic approaches to controlling, managing or eliminating asbestos exposure including removal, encapsulation, developing enclosures and managing in place. These approaches are described in the following sections. It should be noted that while the cost to manage ACMs in place is relatively minimal in the short-term in comparison to the cost for removal, consideration must be made to the long-term cost of maintaining and monitoring asbestos materials and periodic minor removal of ACMs.

6.1 Removal

With removal, ACMs are detached from the underlying surface, collected and placed in containers for disposal at an approved waste disposal facility. The building component substrate is then thoroughly cleaned to remove all residual ACMs.

Removal of ACMs can be the most expensive management option and may require interruption of building activities. Once removal is complete, no further asbestos management is necessary. Removal is often recommended for ACMs that are friable and observed to be in fair to poor condition.

6.2 Encapsulation

Encapsulation of ACMs involves coating the ACMs with a bonding agent or sealant. Sealants penetrate and harden the ACMs or cover the surface with a protective coating. Sealants are applied over the surface of the ACMs using a low pressure, airless sprayer to reduce the potential for release of asbestos fibres during its application.

Encapsulation of ACMs is a viable option in locations where ACMs are not accessible for damage by contact, and where the application does not result in further degradation of the ACM. Encapsulated ACMs must be inspected regularly for deterioration or damage.

Encapsulation may be a cost effective solution for the management of ACMs in the short term, however long term costs are greater due to the cost of maintenance and monitoring and eventual removal.

6.3 Enclosure

The enclosure of ACMs involves the construction of a permanent barrier, or in the case of pipe insulation, the application of a metal, canvas or plastic jacket to the outside of the pipe. The enclosure must be maintained to prevent the release of airborne asbestos, and necessary safety precautions must be taken when repairing or entering the enclosure to prevent the release of airborne asbestos.

6.4 Management

Managing ACMs in-place represents the lowest level of action required to ensure that ACMs are properly managed. ACMs that can be managed in place must be in good condition and not susceptible to external factors that could lead to deterioration and subsequent fibre release. Under these criteria, the ACM's are regularly (e.g. at least annually) surveyed to evaluate whether deterioration and/or external factors may be precipitating potential fibre release.

If no change in condition is determined during the annual re-assessment, no additional action(s) will be required to maintain identified ACMs. However, should the re-assessment identify deterioration or external factors causing degradation, the ACM must then be re-categorized to the appropriate action level.

EMERGENCY RESPONSE PROCEDURES

7.1 Emergency Response Procedures

In the event of accidental damage to any suspected ACM, the following procedures must be initiated to contain the damage and prevent further release:

(Note: if there is any doubt whether the material is asbestos containing, it shall be treated as an ACM until proven otherwise)

- The person discovering the damaged suspected ACM shall immediately:
 - Clear the area of all occupants;
 - Isolate the area by closing doors;
 - Contact the Building Supervisor and provide the following information:
 - Location and approximate amount of the released material; and,
 - Operational impact (if any);
- The Building Supervisor shall ensure that the CCAHS Hazardous Building Materials Survey is referenced to determine if the damaged material contains asbestos. If the inventory indicates that it is likely that the material is an ACM, it shall be managed as such. If not and if time allows, a sample may be collected to confirm the presence/absence of asbestos. ACMs must be managed as follows:
 - The Building Supervisor shall ensure that the damage details are recorded and that action is initiated to have the damaged ACM contained;
 - If the damage occurs within a room, all exit doors should be closed and sealed with 6mm polyethylene sheeting and duct tape. Signage should be placed on the door to warn persons not to enter;
 - If the damage occurs in an open area, a perimeter should be established around the damage to keep occupants at a safe distance. The perimeter should be as large as deemed necessary and marked with hazard tape;
 - Damaged ACMs must be cleaned up following the appropriate procedures for the type of material.

PERSONAL PROTECTIVE EQUIPMENT

8.1 General Requirements

Exposure to asbestos fibres can be minimized through the use of proper personal protective equipment (PPE).

Any asbestos abatement conducted at the CCAHS building shall be in accordance with the requirements of the latest version of CSA Standard CSAZ94.4-“Selection, Use, and Care of Respirators.

All abatement workers who are expected to disturb asbestos containing materials must be issued a properly fitted and tested respirator. Respiratory equipment shall meet and be used in accordance with applicable Workplace Health and Safety Regulations and the National Institute of Occupational Health and Safety (NIOSH).

The respiratory protection training and fit test forms shall be retained on file by the employer. Workers must be clean-shaven.

Workers shall wear protective full body clothing and equipment which may consist of disposable full body coveralls and head covers with elastic cuffs and ankles, disposable gloves, and disposable foot wear.

8.2 Storage and Handling of Personal Protective Equipment

The following are key considerations for the storage and handling of personal protective equipment:

- Materials and equipment shall be properly stored in dry, heated and ventilated areas that provide protection from damage, contamination and exposure to the elements;
- Non-disposable type protective clothing, footwear and equipment shall be left in the contaminated equipment room until the end of the abatement work, at which time such items shall be disposed of as asbestos waste, or shall be thoroughly cleaned of all asbestos or asbestos containing materials. Contaminated clothing and footwear shall not be worn outside the work area;
- Material and equipment shall be handled in strict accordance with the manufacturer’s recommendations;

- Damaged or deteriorated PPE may not be used. Contaminated PPE shall be properly decontaminated or disposed of as contaminated debris.

CHAPTER 9 **ASBESTOS ABATEMENT PROCEDURES**

The following section details the procedures to be used for asbestos abatement work. The procedures described herein are designed to meet or exceed regulatory requirements for the abatement of asbestos and are consistent with the best practices of industry.

Qualified, professional asbestos abatement contractors must be employed for asbestos abatement work.

To maintain the safety of persons and property, all work that could potentially disturb or remove asbestos containing materials must first be approved by the Building Supervisor.

Prior to authorizing any such work, the Building Supervisor shall ensure that a detailed written work plan specifying all precautions required by applicable legislation is prepared and implemented. Where the work involves the services of more than one contractor, a designated principal contractor will be appointed for the work, who in turn shall be responsible to prepare and implement written work plan for co-ordination of the activities of all subcontractors.

Asbestos abatement work procedures shall be specific to each project and/or work area. The work procedures shall include establishment of the containment enclosure, abatement procedures, monitoring, respiratory protection, personal protective equipment and clothing, signage and disposal of asbestos containing waste.

9.1 Classification of Abatement Activities

Abatement procedures are classified according to the risk of exposure to airborne asbestos fibres, generally described as low, moderate or high risk. Industry standards define the categories of risk as low risk (minimum (Type 1) precautions), moderate risk (intermediate (Type 2) precautions) and high risk (maximum (Type 3) precautions) as detailed below. It should also be noted that the Province of Nova Scotia has a document titled *A Guide to Removal of Friable Asbestos Containing Material*. This document may be used as guidance for any establishment considering the removal of friable asbestos. In addition, this document may be adopted as a code of practice by an employer who is removing friable asbestos and is ordered to establish or adopt a code of practice by the

Director of the Occupational Health and Safety Division, or a delegate of the Director, under Section 66 of the Occupational Health and Safety Act.

It is recommended that, prior to commencing a work activity involving asbestos containing materials, a qualified person review the activity and choose an appropriate level of exposure control and precautions, based on requirements and the specific situation in the workplace.

9.1.1 Low Risk Work Activities - Minimum Precautions

Low risk work activities are activities that involve the handling of or working in proximity to non-friable asbestos-containing material and include the following activities:

- Installing or removing other non-friable asbestos-containing materials if the material is not being broken, cut, drilled, abraded, ground, sanded or vibrated, and dust is not being generated,
- Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if the material is wetted to control the spread of dust or fibres, and the activity is done only with non-powered hand-held tools, and,
- Removing minor amounts (less than 1 m²) of drywall in which joint cement contains asbestos.

9.1.1.1 LOW RISK WORK PROCEDURES (MINIMUM PRECAUTIONS)

The following measures and procedures shall be adhered to during minimum precaution operations:

- The minimum PPE required is a half-face respirator equipped with HEPA filter cartridges (P100) and coveralls. A water source sufficient to wet the non-friable ACM must be present in the asbestos abatement work area;
- 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 item to be worked on, if the dust on that surface is likely to be disturbed;
- The spread of asbestos dust from the work area shall be controlled by measures appropriate for the intended work including the use of 6 mm polyethylene sheeting or other suitable material;
- In the case of an operation mentioned above, the product shall be wetted unless wetting creates a hazard of causing damage;
- Frequently, and at regular intervals during the work activities, and immediately upon completion of the work:
 - Dust and waste containing asbestos 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;
 - Drop sheets that will be reused shall be cleaned using a vacuum equipped with a HEPA filter or by damp wiping and;
 - Drop sheets that are to be disposed of shall be wetted and folded to contain the dust and placed in a container;
- Compressed air shall not be used to clean up and remove dust from any surface;
- Eating, drinking, chewing or smoking shall not be permitted in the work area;
- Facilities for the washing of hands and face shall be made available to a worker and shall be used by every worker when leaving the work area.

9.1.2 Medium Risk Work - Moderate Precautions

Moderate risk activity means activity that involves the handling of asbestos-containing material or working in proximity to friable asbestos-containing material, not otherwise classified as low-risk or high-risk activities and generally includes:

- Applying tape or a sealant or other covering to pipe or boiler insulation that is asbestos-containing material;
- Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if:
 - The material is not wetted to control the spread of dust or fibres; and,
 - The activity 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 activity is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters;
- Removing insulation that is asbestos-containing material from a pipe, duct or similar structure using a glove bag; and,
- Cleaning or removing filters used in air-handling equipment in a building that has sprayed fireproofing that is asbestos-containing material.

9.1.2.1 MODERATE RISK WORK PROCEDURES (INTERMEDIATE PRECAUTIONS)

Although specific requirements may vary, the procedures for low risk work shall be applied, in addition to the following general procedures, when work is classified as moderate risk:

- Submit an Asbestos Abatement Work Plan to the Building Supervisor describing the specific abatement procedures to be implemented. The Building Supervisor must approve the procedures prior to authorizing the work to proceed;
- Establish an enclosure around the work area. Unless otherwise specified by the Building Supervisor, all medium risk enclosures shall be delineated by barriers isolating the work area from surrounding areas;
- At the discretion of the Building Supervisor, plywood hoarding or barriers constructed with 6 mm polyethylene sheeting may be specified for the perimeter of the work area to protect against accidental damage caused by persons and/or equipment in adjacent operational area;
- Place signs around the perimeter of the work area indicating that asbestos work is in progress and that entry into the designated work area is permitted only to authorized persons who are adequately protected against the hazards within that work area;
- Put a drop sheet consisting of at minimum 6mm polyethylene sheeting below the material to be removed;
- If the work area cannot be effectively isolated, a 6mm polyethylene plastic enclosure should be built. The enclosure must have overlapping flaps at the entrance to allow the area to be sealed once workers have entered;
- Turn off and isolate the HVAC supply and exhaust to the area;
- Ventilate the enclosed area if necessary by drawing air from the room through a HEPA equipped negative air unit;
- All persons in the abatement area must wear respiratory protection adequate for the anticipated level of exposure;

- All persons entering the abatement work area must wear Tyvek or equivalent disposable coveralls. Protective coveralls must be repaired or replaced immediately if torn or damaged. Protective coveralls used within the enclosure may not be worn outside the perimeter containment. Contaminated protective coveralls must be disposed of as contaminated waste;
- Eating, drinking and smoking are not permitted inside perimeter containment;
- Surfaces being cleaned shall be kept wet during this work. No residue shall remain which when dry could release fibres into the air:
 - Prior to removing any asbestos, the material must be sprayed and saturated with amended water using airless spray equipment capable of producing a “mist” to control the release of fibres as the work progresses;
 - The material must be saturated sufficiently to wet it to the substrate without causing excess dripping or delamination. As necessary, allow sufficient time for two wettings prior to the commencement of stripping to ensure that the insulation has been saturated and wetted to the substrate;
 - The material must be sprayed repeatedly during the removal process to maintain the wet condition;
 - The saturated material shall be removed in small sections and placed in sealable 6 mm polyethylene bags;
 - Material shall not be allowed to dry out or accumulate on the floor of the work area;
- When stripping has been completed, all surfaces from which asbestos has been removed shall be cleaned to remove all visible material;
- When cleaning is complete and all visible asbestos has been removed from the work surfaces, the contractor shall call for the inspection by the Building Supervisor or his designate;
- The Administrator or his designate shall inspect the work area and provide visual clearance, or stipulate additional cleaning requirements;
- Should additional cleaning be required, the contractor must call for another inspection once the remedial work is completed;
- Following visual clearance, the contractor shall proceed with application of an approved asbestos sealer to all exposed surfaces, including 6mm polyethylene barriers and the space of the work room; and,
- The disposal bags shall be sealed, the outside of the bags shall then be cleaned and placed in a second clean 6 mm polyethylene bags;
- Air sampling shall be completed as necessary in accordance with Chapter 11;
- The disposal bags shall be sealed, the outside of the bags shall then be cleaned and placed in a second clean 6 mm polyethylene bags;
- The Building Supervisor must be notified when the work has been completed satisfactorily, including the receipt of acceptable air clearance sample results.

9.1.2.2 GLOVE BAG REMOVAL PROCEDURES

Although specific requirements may vary for each abatement the procedures for low risk work shall be applied, in addition to the following general procedures, when abatement work is completed by glove bag removal:

- Isolate the work area as necessary to prevent observation of abatement work by building occupants and/or the public, following containment protocols stipulated in moderate risk work procedures;
- Place a drop sheet consisting of a minimum 6mm polyethylene sheeting below the material to be removed;
- Don appropriate PPE;
- Place required tools in glove bag;
- Attach glove bag to area using adjustable nylon straps, tie straps, and/or duct tape;
- Note: Glove bag shall not be sealed directly to pipe(s) where the external temperature of the pipe exceeds 70 degrees Celsius;
- Insert HEPA filtered vacuum cleaner hose in vacuum port of glove bag and thoroughly wet down insulation material;
- After ensuring the bag is ready for use, perform a leak test. Remove the sprayer wand from the bag, insert a smoke tube in its place and fill the bag with smoke. Squeeze the bag and verify whether smoke is contained within the bag. Momentarily turn on the vacuum cleaner to extract the smoke;
- Place hands inside gloves of glove bag. Carefully remove insulation and place at bottom of glove bag, ensuring all materials are removed by scraping or brushing as required;
- Insert sealant spray wand through water inlet port of glove bag and apply a liberal coating of sealant to the bare pipe, ends of insulation on pipe, inside surfaces of glove bag tools and removed materials;
- Close up bag. Grasp tools and withdraw arm from glove bag-turning armlet inside out, the tools now being inside the inverted glove;
- Twist the removed armlet and attach two tie straps approximately two inches apart to seal off the glove bag and the glove containing the tools and cut through the armlet between the two tie straps;
- Place the severed end of the sleeve inside the next glove bag to be used;
- Turn on the vacuum cleaner and allow vacuum to collapse the bag, secure neck with a tie strap;
- Place 6mm labelled disposal bag over the glove bag, pulling it up from below. While supporting the bag, remove the straps securing the glove bag to the pipe and carefully lower both bags;
- Fold the top of the glove bag to close and secure it with a tie strap and hold the glove bag down inside the outer bag. Fold the neck of the outer bag and secure closed with a tie strap. Set bag aside for subsequent disposal;
- Inspect the pipe to ensure that all insulation has been removed. Remove any residual pieces of dust using a HEPA filtered vacuum or wet cloths, disposing of used cloths as contaminated waste;
- Vacuum any debris from the drop sheet and spray mist with sealant. Fold it up and place it inside a 6mm disposable bag; and
- All waste materials are to be double bagged and disposed of in a licensed landfill as soon as possible. Waste materials are not to be left at the work site unattended.

9.1.3 High Risk Work - Maximum Precautions

High risk work activities includes activity that involve the handling or the disturbance of friable asbestos containing material or working in proximity to friable asbestos-containing material, where

there is a high level of control necessary to prevent exposure to excessive concentrations of airborne asbestos and includes:

- The removal or disturbance of more than 1 m² of friable asbestos-containing material in a workplace, even if the activity is divided into smaller jobs;
- The spray application of a sealant to friable asbestos-containing material;
- Cleaning or removing air-handling equipment, but not including filters, in a building that has sprayed-on fireproofing that is asbestos-containing material;
- Repairing, altering or demolishing any part of a kiln, metallurgical furnace or similar structure that contains asbestos-containing materials;
- Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material, if the activity is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters; and,
- Repairing, altering or demolishing any part of a building in which asbestos is or was used in the manufacture of products, unless the asbestos was cleaned up and removed.

9.1.3.1 HIGH RISK WORK PROCEDURES (MAXIMUM PRECAUTIONS)

Although specific requirements may vary for each abatement, the procedures for Low and Medium Risk work shall be applied, in addition to the following general procedures, when abatement work is classified as high risk:

- A pre-contamination inspection completed prior to start of abatement. The Building Supervisor will designate the person to perform this inspection. Typically it will be the Asbestos Abatement Coordinator;
- Should a room be used as the high risk containment enclosure, all openings, penetrations or cracks in the walls, ceilings or floors must be sealed with 6mm polyethylene sheeting, 2" wide duct tape and spray glue as necessary;
- Ensure perimeter barriers are effectively sealed and taped. Any defective or damaged barriers must be immediately replaced;
- Inspect the interior and exterior of the enclosure at the beginning and end of each work shift, or more frequently as necessary to ensure the integrity of the enclosure;
- Negative air units must undergo proper integrity testing (PAO/DOP) to ensure effective operation; HEPA filters must be inspected multiple times daily to ensure overloading of the filter does not occur;
- Abatement contractor is expected to demonstrate constant negative air pressure (> -5 Pascals) by the means of the use of a differential pressure monitor (i.e. omniguard, magnahelic gauge);
- A decontamination enclosure system shall be erected, and shall:
 - Consist of a clean room, shower room and an equipment room;
 - Be constructed with 2X4 studs at 16 inches on centre, unless otherwise specified;
 - Be sheathed with 5/8" D-grade plywood for non-occupied areas, and 5/8" GIS (Good One Side) plywood for occupied areas, unless otherwise specified in the contract documents;
 - GIS plywood must have the good side facing the occupied area. Paint plywood white and use 2" white duct tape to seal all joints; and
 - Have the interior lined with 6 mm polyethylene and sealed with tape at the lap joints.

- Clean Room- Construct the clean room at least 1.8m long, with one double curtained doorway leading into the shower and one entrance or exit to a non-contaminated area. The entrance/exit door shall be provided with a lock for security as necessary;
- Shower Room - construct the shower room at least 1.8 m long, with two double curtained doorways, one leading to the equipment room and one to the clean room. The shower room shall contain a shower with hot and cold running water. Wastewater must be filtered through a five-micron filter system prior to releasing into the sanitary system;
- Decontamination Room – Construct the decontamination room at least 1.8m long, with two double curtained doorways, one leading to the work area and the other leading to the shower room;
- Waste Transfer Room - Construct the waste transfer room with an air lock and two curtained doorways, one leading to the work area, the other leading to the holding area;
- Holding Area - Where required, a holding area will be constructed to retain waste material prior to final removal from site. The holding area shall be enclosed with two curtained doorways, one leading to the waste transfer room and one leading to the exterior. Place signage on the exterior door to prevent unauthorized access;
- Be labeled with signs to restrict entry to authorized personnel;
- Be maintained under negative pressure using HEPA negative air units, 24-hours per day for the duration of the work and until the area has passed clearance testing after cleanup;
- Have a minimum of 4 air changes per hour or a static pressure of negative five (-5) Pascals relative to pressure outside the enclosure, as measured inside the enclosure at a point furthest from the exhaust fan; and
- Have at least one observation window made of a transparent material that, where reasonably practicable, enables a person who is located outside of the enclosure to see work activity that is taking place inside the enclosure;
- Surfaces being cleaned shall be kept wet during this work. No residue shall remain which, when dry, could release fibres into the air:
 - Prior to removing any asbestos, the material must be sprayed and saturated with amended water using airless spray equipment capable of producing a “mist” to control the release of fibres as the work progresses;
 - The material must be saturated sufficiently to wet it to the substrate without causing excess dripping or delamination. As necessary, allow sufficient time for two wettings prior to the commencement of stripping to ensure that the insulation has been saturated and wetted to the substrate;
 - The material must be sprayed repeatedly during the removal process to maintain the wet condition;
 - The saturated material shall be removed in small sections and placed in sealable 6 mm polyethylene bags;
 - Material shall not be allowed to dry out or accumulate on the floor of the work area;
- When stripping has been completed, all surfaces from which asbestos has been removed shall be cleaned to remove all visible material;
- When cleaning is complete and all visible asbestos has been removed from the work surfaces, the contractor shall call for the inspection by the Building Supervisor or his designate;

- The Building Supervisor or his designate shall inspect the work area and provide visual clearance, or stipulate additional cleaning requirements;
- Should additional cleaning be required, the contractor must call for another inspection once the remedial work is completed;
- Following visual clearance, the contractor shall proceed with application of an approved asbestos sealer to all exposed surfaces, including 6mm polyethylene barriers and the space of the work room; and,
- The disposal bags shall be sealed, the outside of the bags shall then be cleaned and placed in a second clean 6 mm polyethylene bags, and then the bags can be transferred to the holding area pending removal to the uncontaminated area and placed in a container to transfer to the disposal site.

9.1.4 High Risk Clearance/Tear Down Procedures

After the sealer has been applied and allowed to dry, air sampling will be conducted.

Note: The negative air system may not be shut down during air sampling. Final acceptance and approval of the work will require that:

- No visible signs of contaminated materials are evident;
- Air sample analysis confirms that fibre levels are no greater than 0.01 f/cc;
- The CCAHS personnel provides a written report presenting the air sample results. Should the levels exceed 0.01 f/cc, additional remedial actions shall be required with no additional costs;
- Once the contractor has received the written report confirming air sample results at or below 0.01 f/cc, the contractor may proceed with the tear down of the containment;
- All work areas, decontamination systems, etc., shall be included in the tear down;
- All used polyethylene, contaminated materials, clothing etc., shall be bagged, sealed and transferred to the waste disposal site;
- The Building Supervisor must be notified when work has been completed satisfactorily, including the receipt of acceptable air clearance sample results. The Building Supervisor can sign the Asbestos Project Notification Form indicating that the work has been completed satisfactorily.

CHAPTER 10 **AIR MONITORING AND AIR CLEARANCE**

10.1 Air Sampling

Throughout the course of asbestos abatement work, the following air samples shall be collected by qualified personnel:

- Background sampling shall be conducted before abatement work begins to establish baseline airborne fibre levels;
- Daily ambient air sampling around the exterior perimeter of the work area. The number of samples collected will be a function of the size of the containment;
- Daily air sampling collected inside the clean room. One sample will be collected during each shift;
- Occupational sampling inside the work area, if warranted. One sample will be collected per work shift until the sampling demonstrates the effectiveness of the work procedure. Subsequent occupational sampling may occur at the discretion of owner or the approved asbestos consultant; and,
- Clearance sampling within the abatement enclosure shall be completed in accordance with Section 8 of the *Nova Scotia Code of Practice, A Guide to Removal of Friable Asbestos Containing Material*. One sample shall be collected for every 270 m² of enclosure to determine suitability for re-occupancy;
- All samples for airborne asbestos fibres must be collected, prepared, analyzed, and reported in accordance with the NIOSH Method 7400, Issue 2: Asbestos and Other Fibers by PCM (August 15, 1994), or NIOSH Method 7402, Issue 2: Asbestos by TEM (August 15, 1994), or by a method that provides for an equivalent or greater level of precision and accuracy.

10.2 Air Sample Results

Air sample results shall be available as soon as possible subsequent to sample collection. Copies of all air monitoring reports shall be provided to the abatement contractor for posting at the worksite.

The Building Supervisor or an approved asbestos consultant shall review the lab results to determine if they are within regulated permissible fibre concentrations.

Immediate action must be taken if the concentration of airborne asbestos is found to exceed 0.01 fibres/cc of air in an indoor area that is outside the enclosure. The Building Supervisor reserves the

right to stop any abatement activities until such time as fibre levels have returned to acceptable levels, and/or the abatement contractor has satisfactorily demonstrated to the Building Supervisor that the abatement activities will not generate fibre counts above the specified acceptable levels.

10.3 Air Clearance

After asbestos removal and final cleaning, a contractor representative and Facility Management representative or approved abatement consultant will conduct a final visual inspection of the work site to verify all ACMs have been satisfactorily removed and the area is ready to be sealed. Once the final inspection has passed, the inside of the entire enclosure is to be sprayed with an approved sealant (lock-down). This sealant acts to capture residual airborne fibres and particulate as they settle and bond them once the glue is dry. The negative air unit operates during the settling time.

After the area has been encapsulated from the lock-down, air clearance sampling must be conducted to determine safe occupancy:

- A minimum of twenty-four (24) hours settling/drying time shall be permitted before conducting clearance air sampling. Note: The Building Supervisor may stipulate a longer settling/drying time based on the size of the enclosure area;
- A minimum of one (1) air clearance sample shall be collected for every 270 m³ of interior enclosure volume. The minimum recommended volume of air clearance samples is 1350 litres;
- Samples must be analysed as soon as possible after sampling;
- In order to pass air clearance, the concentration of detectable fibres shall not exceed 0.01 f/cc;
- After passing the final air clearance (<0.01 f/cc), the containment can be dismantled;
- If air clearance fibre count exceeds 0.01 f/cc, air clearance shall not be granted. The abatement contractor shall re-clean and apply a second application of glue encapsulate throughout the containment area. A second 24-hour settling time is required, then the area is re-sampled until a passing air clearance fibre level (<0.01 f/cc) is achieved;
- Once air clearance is attained and granted, tear down may proceed;
- All enclosure materials are to be handled, bagged and disposed of as asbestos contaminated waste.

CHAPTER 11 **LIMITATIONS**

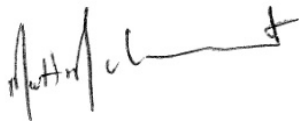
The results presented in this report are indicative of the observations made and samples collected at the time and place noted in this report. The opinions contained in this report are based upon accepted professional principals but should not be interpreted as legal or medical advice or as a guarantee or warranty regarding potential liability associated with conditions at this site.

Any use that a third party makes of this report, or any reliance on, or decisions made based upon it, are the responsibility of such third parties. CBCL Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made based upon this report.

Should additional information become available, CBCL Limited requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

Respectfully Submitted,

CBCL Limited



Prepared by:
Matt McClement
Environmental Technician
Email: mmcclement@cbcl.ca



Reviewed by:
Stephanie Kilfoil, B.Sc., P.Eng.
Senior Environmental Engineer
Email: skilfoil@cbcl.ca

Inventory of Asbestos Containing Materials

Inventory of Asbestos Containing Materials

The following ACMs have been identified at the CCAHS as part of CBCL's 2019 Hazardous Building Materials Survey:

Summary of ACMs at CCAHS

ACM Material	Location	Condition	Accessibility	Action
Texture coating materials	Ceilings in the subject building including above ceiling tiles in some locations.	Good	Ranging from Access (C) Exposed and Access (C) Concealed	Action 7
Straight run pipe insulation and pipe elbows	On mechanical piping throughout the building including above ceiling tiles. It should be noted that additional ACM insulation materials may be present in concealed locations (i.e., behind solid ceilings and wall cavities).	In ranging condition. A number of elbows were noted to be in Fair to Poor condition with associated debris including in the Main Hallway, Staff Washroom, South Wing Hallway, Rooms 101, 103, 105, 108, 109, 110, Men's washroom (potential debris associated with previous removal) and mechanical room.	Ranging across all accessibilities. ACMs in poor condition in areas described as Access (C) concealed.	Actions 2 and 4
Tan vinyl sheet flooring covering older vinyl floor tile materials	Room 130	Good	Access (A)	Action 7
12"x12" vinyl floor tile	Room 107	Good	Access (A)	Action 7
A lighting heat shield	Bathroom located in Room 105	Good	Access (C)	Action 7
Window caulking	Interior of the Men's Washroom window	Good	Access (A)	Action 7

ACM Material	Location	Condition	Accessibility	Action
Cementitious material (transite)	<p>Noted on interior and exterior of the building.</p> <p>One panel was observed within the south-wing hallway ceiling cavity.</p> <p>Transite panels were noted at the exterior of the building, above some doors.</p>	Good	Access (C)	Action 7
Expansion joint material	Observed in wall expansion joints on the interior and exterior of the building.	Good	Access (A)	Action 7
Exterior grey caulking material.	Noted around exterior doors	Good	Access (A)	Action 7

Identified ACMs as well as materials that are visually similar to the identified ACMs should be managed as asbestos containing materials unless sampled and demonstrated to be non-asbestos containing.

This information should be considered together with CBCL's Hazardous Building Materials Survey Report of the CCAHS, included in Appendix E of this AMP.

Evaluation of Asbestos Containing Materials and Recommendations for Control

Evaluation of Condition

Public Works and Government Services Canada provides the following information for describing condition, accessibility and actions for control of asbestos containing materials

<https://www.tpsgc-pwgsc.gc.ca/biens-property/ami-asb/nga-ams-eng.html>.

Material	Spray-applied Fireproofing, Insulation and Texture Finishes
Good	Surface of material shows no significant signs of damage, deterioration or delamination. Up to 1% of the surface area having visible damage to surface is allowed within range of Good . Evaluation of sprayed fireproofing requires the assessor to be familiar with the irregular surface texture typical of sprayed asbestos products. Good condition includes un-encapsulated or unpainted fireproofing, insulation or texture finishes where no delamination or damage is observed, and encapsulated fireproofing, insulation or texture finishes where the encapsulation has been applied after the damage or fallout occurred.
Fair	Not used or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.
Poor	Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of asbestos-containing material spray.
Material	Mechanical Insulation (e.g., on piping, tanks equipment)
Good	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration, i.e. no insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e. scuffs or stains), but the jacketing is not penetrated.
Fair	Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination), or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation should range from minor to none.
Poor	Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.
Material	Non-Friable (e.g., vinyl floor tile, caulking, expansion joint compound) and Potentially Friable Materials (drywall, acoustic ceiling tiles, transite board)
Good	No significant damage is present. The material may be cracked or broken but is not considered likely to become friable upon casual contact.
Fair	Not considered an applicable condition for rating non-friable materials
Poor	Material is severely damaged. Loose debris is present of binder has disintegrated to the point where contact will cause the material to become friable.

Evaluation of Accessibility

The accessibility of asbestos containing materials may be described as follows:

Access (A)	Areas of the building that are considered within reach (from floor level) of all building users. Includes areas such as gymnasiums, workshops, and storage areas where activities of the building users (e.g. basketball on gym ceiling) may result in disturbance of asbestos-containing material not normally within reach from floor level.
Access (B)	Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder. These areas include frequently entered pipe chases, tunnels and service areas or areas within reach from a fixed ladder or catwalk, e.g. tops of equipment, mezzanines.
Access (C) Exposed	Areas of the building above 8'0" where use of a ladder is required to reach the asbestos-containing material. This only refers to asbestos-containing materials that are exposed to view, from the floor or ladder, without removing or opening other building components such as ceiling tiles, or service access doors or hatches. Does not include infrequently-accessed service areas of the building.
Access (C) Concealed	Areas of the building which require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems such as a ventilation plenum. Includes rarely-entered crawl spaces, attic spaces, etc. Observations are limited to the extent visible from the access points.
Access (D)	Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of the ceiling, wall or equipment, etc., is required to reach the asbestos-containing material. Evaluation of condition and extent of asbestos-containing material is limited or impossible, depending on the assessor's ability to visually examine the materials in areas rated Access (D).

Action Matrix for the Control of ACMs

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 5/7 ¹	Action 5/6 ²	Action 3	Action 1
(B)	Action 7	Action 6/5 ³	Action 3	Action 1
(C) Exposed	Action 7	Action 6	Action 4	Action 2
(C) Concealed	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

Note:

¹ If ACM in Access (A)/Good condition is not removed, Action 7 is required

² If material in Access (A)/Fair condition is not removed, Action 6 is required

³ Remove ACM in Access (B)/Fair condition if ACM is likely to be disturbed

⁴ Non-friable or manufactured products are considered in the action matrix as follows:

- Non-friable and manufactured products reported in **Poor** condition, or friable **Debris** resulting from the deterioration of non-friable asbestos-containing material, are treated as friable materials and the appropriate action, depending on accessibility, is determined from the action matrix for friable asbestos-containing material.
- For non-friable or manufactured products reported in **Good** condition, Action 7 (surveillance) is recommended regardless of accessibility.

Legend:

Action 1	<p>Immediate clean-up of debris that is likely to be disturbed.</p> <p>Access that is likely to cause a disturbance of the ACM debris is to be restricted and clean up ACM debris is to be done immediately using appropriate asbestos procedures. This action is required for compliance with regulatory requirements and good practice. The assessor should immediately notify the Building Supervisor of this condition.</p>
Action 2	<p>Entry into areas with ACM debris requires a minimum of intermediate risk precautions.</p> <p>At locations where ACM debris can be isolated in lieu of removal or cleaned up, appropriate means to limit entry to the area is to be used. Access to the area is restricted to persons using a minimum of intermediate risk asbestos-work precautions. The precautions will be required until the ACM debris has been cleaned up, and the source of the Debris has been stabilized or removed following procedures appropriate to the scope of the removal work.</p>
Action 3	<p>Asbestos-containing material removal required for compliance.</p> <p>Asbestos-containing material must be removed for compliance with regulatory requirements and good practice. Use asbestos procedures appropriate to the scope of the removal work.</p>
Action 4	<p>Access into areas where asbestos-containing material is present and likely to be disturbed by access requires a minimum of intermediate risk precautions.</p>

	<p>Moderate risk asbestos precautions are to be used when entry or access into an area is likely to disturb the ACM. Action 4 must be used until the asbestos-containing material is removed (Use Action 1 or 2 if Debris is present). Use asbestos procedures appropriate to the scope of the removal work.</p>
Action 5	<p>Proactive asbestos-containing material removal.</p> <p>Removal of asbestos-containing material in lieu of repair may be considered, even if it is in Good condition at locations, where asbestos-containing material is easily accessible, limited in quantity, and removal would be cost-effective.</p>
Action 6	<p>Asbestos-containing material repair.</p> <p>Asbestos-containing material may be repaired if found in Fair condition and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, asbestos-containing material is to be treated as being in Good condition and Action 7 is to be implemented. If asbestos-containing material is likely to be damaged or disturbed during normal use of the area or room, Action 5 is to be implemented.</p>
Action 7	<p>Routine surveillance.</p> <p>Routine surveillance of the asbestos-containing material is to be instituted. Trained workers or service providers must use appropriate asbestos precautions (low, intermediate or high) during disturbance of the remaining asbestos-containing material.</p>

Forms

Asbestos Work Notice Form

Date: _____

Project Description:

Subject Location:

Building: _____

Room (s): _____

Start Date/Time: _____ Finish Date/Time: _____

Contractor: _____ No. of Personnel: _____

Supervisor/Foreman: _____ Phone: _____ (Work)
_____ (Cell)

Building Supervisor Approval

Asbestos Operation:

Minimum Risk__
High Risk__

Intermediate Risk__
Glove Bag__

Work Commencement Approved: _____ (Print/Signature)

_____ (Date)

Work Completion Approved: _____ (Print/Signature)

_____ (Date)

Contractor Asbestos Awareness Form

Contractor Company: _____

Subject Location:

Building: _____

Room (s): _____

Contractor Employee:

By signing this form I acknowledge and understand that the subject location (noted above) at the CCAHS building has an Asbestos Management Plan and that I may be working in areas with asbestos containing materials. I understand that I can review the Asbestos Survey for this location, if I should have any concerns. Should my work require the disturbance or should I disturb any of the asbestos containing materials, I will immediately report this to the Building Supervisor.

Contractor Signature: _____

Date: _____

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APPENDIX E

CCAHS Hazardous Building Materials Survey Report

Hazardous Building Materials Survey Report

Chignecto-Central Adult High School (CCAHS Elmsdale),
224 Highway 214, Elmsdale, NS




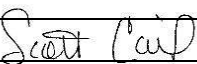

181255.00 • Hazardous Building Materials Survey Final Report • October 2019

Prepared for:



Prepared by:



Final Report		2019/09/18	
Draft Report	Stephanie Kilfoil	2019/02/05	Scott Cail
Issue or Revision	Reviewed By:	Date	Issued By:
 CBCL LIMITED Consulting Engineers		<p>This document was prepared for the party indicated herein. The material and information in the document reflects CBCL Limited's opinion and best judgment based on the information available at the time of preparation. Any use of this document or reliance on its content by third parties is the responsibility of the third party. CBCL Limited accepts no responsibility for any damages suffered as a result of third party use of this document.</p>	



CBCL LIMITED

Consulting Engineers

September 18, 2019

Mr. Michael Hatfield
Procurement Officer
Municipality of East Hants
Email: mhatfield@easthants.ca

Dear Mr. Hatfield:

RE: Hazardous Building Materials Survey Final Report - Chignecto Central Adult High School Elmsdale, 224 Highway 214, Elmsdale, Nova Scotia

CBCL Limited is pleased to provide the Hazardous Building Materials Survey Report for the Chignecto Central Adult High School located at 224 Highway 214, Elmsdale, Nova Scotia.

Please do not hesitate to contact us should you have any questions.

Yours very truly,

CBCL Limited

Stephanie Kilfoil, B.Sc., P.Eng.
Project Manager
Telephone: (506) 633-6650
E-mail: skilfoil@cbcl.ca

Project No: 181255.00

CenterBeam Place
14 King Street, Suite 420
PO Box 20040
Saint John, New Brunswick
Canada E2L 5B2

Telephone: 506 633 6650
Fax: 506 633 6659
E-mail: info@cbcl.ca

www.cbcl.ca

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EXECUTIVE SUMMARY

CBCL Limited completed a Hazardous Building Materials Survey (Hazmat) of the Chignecto Central Adult High School (CCAHS) located at 224 Highway 214 in Elmsdale, NS in December 2018. It is our understanding that the work has been completed in support of proposed demolition and/or renovations of the building.

The subject building is used as office spaces, a community centre and learning facility. In past years, the subject building operated as a school. The building was partially occupied at the time of the site visit.

At the time of the site visit, the building interior was noted to be in good overall condition. The building has been well maintained keeping most exposed building materials intact. Building materials including drywall, flooring materials and ceiling tiles were generally in good overall condition. Deteriorated ACM piping insulation was observed within most ceiling cavities throughout the building. Where observed, this pipe insulation was noted to be in fair to poor condition.

The findings of the CCAHS Hazmat are presented in the following table. Quantities presented are approximate and inferred based on observations made in accessible spaces during the site visit. Additional hazardous materials may be present in concealed locations:

Table E.1: Summary of Hazardous Building Materials

Hazardous Material	Summary of Findings
Asbestos	<p>Laboratory results indicate that asbestos is present in concentrations >0.5% asbestos by weight in the following subject building materials;</p> <ul style="list-style-type: none">• Approximately 275 m² of texture coating materials identified as ACM were noted in the subject building (samples AS-12, AS-15 and AS-20). It should be noted that based on sampling results, all texture coating material should be treated as an asbestos containing material (ACM);• Approximately 170 linear meters of asbestos containing straight run pipe insulation was noted throughout the building (Samples AS-11, AS-24 and AS-27). It should be noted that, solid ceilings limited visual assessment in multiple rooms throughout the building. It is suspected that additional ACM insulation materials may be concealed behind solid ceilings and wall cavities;• Approximately 110 pipe elbows with grey parging cement identified as an ACM (Samples AS-08, AS-09 and AS-26) were noted in the subject building. All pipe elbows that are not fiberglass should be assumed to be asbestos containing. It is suspected that additional ACM insulation materials may be concealed behind solid ceilings and wall cavities;• Room 130 was identified as having ACM flooring. Tan vinyl sheet flooring covering older vinyl floor tile materials were both identified to

Hazardous Material	Summary of Findings
	<p>be asbestos containing. Approximately 25 m² of vinyl flooring materials were identified in Room 130 (samples AS-13 and AS-14);</p> <ul style="list-style-type: none"> Room 107 was identified as having ACM flooring. Tan vinyl floor tile materials were identified to be asbestos containing. Approximately 22.5 m² of vinyl flooring materials were identified in Room 107 (sample AS-36); The bathroom located in Room 105 was identified to have an ACM lighting heat shield within (Sample AS-34). Any units similar to this with heat shields should also be considered asbestos containing; Window caulking identified as an ACM was noted on the interior of the Men's Washroom window (sample AS-19); Cementitious material (transite) identified as containing asbestos was observed on the interior and exterior of the building (Sample EXT-AS-01). One panel was observed within the south-wing Hallway ceiling cavity. Caution should be taken in case transite material is present in any concealed locations. Approximately 2-5 m² was observed in the building interior ceiling cavity. Transite panels were also observed on the building exterior between windows and as soffits above some doors. Approximately 12-15 m² was observed on the building exterior; Expansion joint material identified as containing asbestos was observed on the interior and exterior of the building (Sample AS-28 and EXT-AS-03). Room 110 has approximately 8 linear meters of compound between brick and structural steel within the room. Any other areas found to have the same material between two building components should be considered as an ACM. Expansion joint compound was also observed and collected from the between a seam on the brick wall of the building exterior. The material was also found to contain asbestos; and, Exterior caulking was collected from the building and found to contain asbestos (Sample EXT-AS-06). The material was collected from the seam between a door frame and brick wall. Any caulking materials found on the building exterior matching the description of the above noted sample should be considered as asbestos containing.
Metal Containing Paints and Coatings	Laboratory analytical results indicate that none of the collected paint samples were identified as lead, mercury or arsenic containing paints.
Vermiculite	No evidence of vermiculite was noted to be present.
Other Mercury-Containing Materials (excluding paint)	<p>Building materials were visually assessed for the presence of mercury.</p> <ul style="list-style-type: none"> Four foot linear fluorescent lamps, which contain mercury vapour, were observed throughout lighting fixtures within the subject building; Older style thermostats known to contain mercury vials were observed in various rooms throughout the building.
Other Lead-Containing Materials (excluding paint)	The building was visually assessed for other lead containing materials.

Hazardous Material	Summary of Findings
	<ul style="list-style-type: none"> • Bell house fittings associated with drainage pipes, which have been assumed to have lead caulking, were observed in the subject building; and, • Lead piping or metal pipes with leaded joints or solder appeared to have been removed by vandals from the subject building. However, concealed piping with leaded joints or solder were visible within ceiling cavities in the building and may be also present within wall cavities.
PCBs	<p>The building was visually assessed for the presence of electrical equipment that could contain PCBs.</p> <ul style="list-style-type: none"> • Approximately 200 fluorescent light fixtures were observed in the subject building. Approximately 10% of the lighting ballasts were visually checked for the presence of PCB containing ballasts. All of the inspected ballasts were noted to be non-pcb containing.
Mould	<p>Areas within the subject building were visually assessed for signs of apparent fungal (mould) growth.</p> <ul style="list-style-type: none"> • Areas of mould growth were not observed throughout the subject building.
Halocarbons	<p>The subject area was visually assessed for the presence of refrigeration units and fire suppression equipment that could contain halocarbons.</p> <ul style="list-style-type: none"> • One (1) refrigerator unit and refrigerators suspected to contain halocarbons was noted in the subject building at the time of the Survey. • Multiple air conditioning units suspected to contain halocarbons were noted in various rooms of the subject building at the time of the Survey.
UFFI	<p>No suspected UFFI or indications of UFFI application were observed during the Survey.</p>
Radioactive Materials	<p>Smoke/heat detectors, which have the potential of containing a small amount of radioactive material, were observed in the subject building.</p>
Silica	<p>The building has a concrete slab foundation and concrete block walls. If these materials are cut or broken up during demolition activities, silica dust could be generated.</p>

CHAPTER 1 INTRODUCTION

CBCL Limited (CBCL) was engaged by the Municipality of East Hants to complete a Hazardous Building Materials (Hazmat) Survey of the CCAHS building located at 224 Highway 214, Elmsdale, NS. The purpose of the Hazmat Survey was to identify hazardous building materials present in the building and to provide information regarding appropriate methodologies for handling and disposing of these materials prior to the proposed building renovation and/or demolition activities.

The following report presents the findings related to the Hazmat Survey of the building located on site.

1.1 Building Description

The subject building was previously used as an educational and community outreach facility. In more recent years, the subject building formerly operated mainly as municipal office spaces and as a community centre.

The subject building is a one storey building and consists of two wings with two main hallways and rooms/offices branching from each hallway. It is anticipated that the building was constructed in the 1970s.

The interior walls within the building are constructed of concrete block, wood, steel and/or poured concrete. The majority of the exterior walls are constructed of brick over wood and/or concrete with vinyl siding in some locations. The roof of the CCAHS building was excluded from the assessment.

The floor of the building appears to be a concrete slab on grade. The building is constructed with open web steel joists, concrete block, brick, wood and poured concrete. The interior floor finishes throughout the building consists of vinyl floor tiles, vinyl sheet flooring and concrete. The interior wall finishes throughout the building are a mix of painted concrete and drywall, brick and concrete block. Generally the ceiling was finished with suspended ceiling tiles. The exterior façade of the building consists mainly of brick and some areas of vinyl siding with wood beneath.

At the time of the site visit, the building interior was noted to be in good overall condition. The building appears to have been well maintained keeping most exposed building materials intact. Building materials including drywall, flooring materials and ceiling tiles were generally in good overall condition.

Deteriorated ACM piping insulation was observed within most ceiling cavities throughout the building. Where observed, this pipe insulation was noted to be in fair to poor condition.

1.2 Scope of Work

CBCL's scope of work for the Hazmat Survey included the following:

- Completion of a site survey, including the identification and sampling of materials identified as potentially regulated in the subject building. The site survey included:
 - Completion of sampling of suspected hazardous materials during the site visit and submission of samples to an appropriately accredited laboratory for analysis;
 - Implementation of appropriate measures during, and at the end of each shift to facilitate the health and safety of workers, occupants, etc.;
 - Clean up of any debris generated during the sampling procedures if it was required;
 - Completion of temporary repairs of materials damaged during sampling, where necessary, to minimize exposure of hazardous materials to the building occupants (construction workers / building occupants);
- Preparation and submission of a draft and a final report. The report will include:
 - Findings of the site visit including sampled materials and laboratory results;
 - Provision of site-specific professional advice and recommendations for the identified Hazmats with respect to Hazmats present, their estimated quantities, extent and condition;
 - Provision of layout drawings showing sample locations and analytical results.

During the HAZMAT survey, CBCL completed non-intrusive investigations in select locations (e.g., wall and ceiling cavities) of the building to gain an understanding of building construction and to assess for potential hazardous materials in concealed locations. We conducted non-intrusive investigations in select locations based on our professional judgment and assessment methodology.

It should be noted that assessment/sampling of the roofing system was not included in the current scope of work. It is recommended that roofing materials be sampled and analyzed for asbestos prior to disturbing these materials.

During the Hazmat Survey, CBCL personnel carried out a visual assessment of readily accessible areas of the subject building. The general conditions were noted and photographed. Samples of select building materials were collected from representative locations and materials. Samples of suspected hazardous materials were collected where appropriate and submitted for laboratory analysis.

2.1 Reference Documentation and Legislative Review

A reference list of the applicable guidelines, regulations and other documentation that were used to evaluate the results and make recommendations with regard to this assessment can be found in Appendix E of this report. Federal and Provincial acts, regulations and guidelines for the handling, storage, or disposal of hazardous building materials, such as the federal Canada Labour Code, Part II, Canada Occupational Health and Safety Regulation, Part X – Hazardous Substances and the provincial *Occupational Health and Safety Act*, were reviewed for applicability to determine the requirements for hazardous materials found at the subject building.

2.2 Site Visit

The Hazmat Survey was completed on December 17 and 18, 2018 by CBCL personnel. The building was assessed for the presence of potential hazardous building materials as well as non-hazardous building materials. The sampling program included the collection of representative samples of suspected asbestos containing materials (ACMs) and suspected metal-containing paints. The building was also assessed for the presence of vermiculite, lead and mercury (in materials other than paint), polychlorinated biphenyls (PCBs), halocarbons and other hazardous substances such as urea formaldehyde foam insulation (UFFI), radioactive materials, mould and silica. The type of material, its general condition and location were noted during the Survey. In addition, photographs of sampled materials were taken.

2.2.1 Hazardous Building Materials

The following hazardous building materials were assessed during the Survey.

2.2.1.1 ASBESTOS-CONTAINING MATERIALS

Representative samples of potential ACMs in the subject building were collected. Samples were collected by hand or using appropriate tools and were then placed in sealed plastic bags for transport to the laboratory. Each sampling location was sprayed with water prior to disturbing the material to reduce the release of dust particulate into the air, if required. Figures showing asbestos sample locations are presented in Appendix A.

2.2.1.2 PAINT

Representative paint samples were collected from the subject building. Paint samples were collected by removing a representative area of paint, including older paint layers when present and substrate where possible. The samples were then placed in sealed plastic bags for transport to the laboratory. Sample collection was conducted in accordance with the ASTM E1729 Standard Practice for Field Collection of Dried Paint Samples for Subsequent Lead Determination. Figures showing paint sample locations are presented in Appendix A.

2.2.1.3 VERMICULITE

The building was visually assessed for apparent vermiculite and potential areas were identified and noted, if present.

2.2.1.4 MERCURY

Thermostats, switches and fluorescent light bulbs that could potentially contain mercury, were noted in accessible areas, where present.

2.2.1.5 LEAD

Suspected lead piping or metal pipes with leaded joints or solder were noted in the accessible areas of the subject building, if present. Emergency lighting with the potential for lead-acid batteries were additionally noted.

2.2.1.6 PCBs

Fluorescent light ballasts and transformers with potential PCBs were visually identified and quantified throughout the subject building, if present.

2.2.1.7 MOULD

Areas of suspected mould growth and water damage were noted during the Survey, if present.

2.2.1.8 HALOCARBONS

A visual assessment was conducted for refrigerators, coolers, HVAC units and any other items that could contain halocarbons within the subject building.

2.2.1.9 UREA-FORMALDEHYDE FOAM INSULATION (UFFI)

A visual assessment was conducted for the presence of UFFI insulation in the subject areas. No sampling was conducted to verify the presence of UFFI.

2.2.1.10 RADIOACTIVE MATERIALS

A visual assessment was conducted for the presence of radioactive materials in the subject building, including smoke detectors. Radon testing was not conducted as part of this Survey.

2.2.1.11 SILICA

Areas containing cement products that would be subject to cutting or disturbance during any future demolition activities were noted.

2.2.2 Laboratory Analysis

2.2.2.1 ASBESTOS SAMPLES

Asbestos containing materials (ACMs) are classified as either friable or non-friable ACMs. Friable samples (can be readily reduced to dust or powder by hand pressure) were analyzed by Polarized Light Microscopy (PLM) and non-friable organically bound (NOB) samples (i.e., vinyl floor tile) were analyzed by PLM NOB or Transmission Electron Microscopy (TEM). Bulk samples collected for asbestos analyses were sent to EMSL Canada Inc. in Mississauga, ON, Canada. EMSL Canada Inc. is certified under the National Voluntary Laboratory Accreditation Program (NVLAP) for Polarized Light Microscopy (PLM) and PLM non-friable Organically Bound (NOB) for the analysis of bulk samples of asbestos. PLM NOB analysis was conducted for the non-friable, organically bound samples. Results of the analytical testing are presented in Chapter 3 and Table 1, Appendix B.

2.2.2.2 PAINT SAMPLES

Paint samples were sent to Maxxam Analytics laboratory (Maxxam) in Bedford, Nova Scotia and were submitted for analysis of lead, (available and leachable where applicable). Maxxam is accredited by the Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA). Results of the analytical testing are presented in Table 2 attached.

FINDINGS & RECOMMENDATIONS

The findings of the Hazmat Survey of the CCAHS building are presented below. Sample locations are shown on Figures in Appendix A. A summary of the findings, including analytical results and estimated quantity and condition of the confirmed hazardous materials are presented in Tables 1 (Asbestos) and 2 (Metal-Containing Paints and Coatings), Appendix B. Quantities of hazardous materials presented below and in Tables 1 and 2 are estimates only. Estimated quantities are based on observations in readily visible areas and should be verified as necessary prior to bidding/commencing abatement activities. Additional hazardous materials may be present in concealed locations in the building. Table 3, Appendix B, presents locations of identified hazardous materials and recommendations for management of these materials. Laboratory certificates are presented in Appendix C. Select site photographs are presented in Appendix D.

While general information on disposal options is provided, it is recommended that facility operators be contacted prior to the transportation of any hazardous waste to confirm acceptability of the material.

3.1 Asbestos

3.1.1 Asbestos-Containing Materials (ACM)

The Hazmat Survey included a review of suspected friable and non-friable ACMs. ACMs are defined in Nova Scotia as materials containing asbestos fibres or asbestos dust in a concentration greater than or equal to 0.5% asbestos by weight. The term friable is applied to a material that can be readily reduced to dust or powder by hand pressure. ACMs that are friable have a much greater potential to release airborne asbestos fibers when disturbed. Provincial regulations regarding ACMs distinguish between friable and non-friable when assigning appropriate work practices. Where friable materials are identified containing asbestos in any concentration, there is the possibility of the release of asbestos fibres posing an occupational health and safety concern or environmental exposure; as such, appropriate occupational health and safety precautions must be implemented. Non-friable materials with concentrations of asbestos that are less than 0.5% are not considered to be ACMs.

The Nova Scotia Asbestos Waste Management Regulations govern the handling, storage and disposal of ACMs. This regulation is under the authority of the *Environment Act* and is administered by Nova Scotia Environment (NSE).

The Nova Scotia Department of Labour and Advanced Education has developed guidelines and codes of practice, pursuant to the *Occupational Health and Safety Act*, for the assessment, management, maintenance, handling and removal of ACMs. The following guidelines and codes of practices are relevant:

- Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace;
- Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material.

3.1.2 Summary of Asbestos Sample Results

A total of 47 samples (4 with two layers), of potential ACMs were collected and submitted for laboratory analysis. These materials included vinyl floor tile, vinyl sheet flooring, piping and mechanical insulation, expansion joint materials, drywall joint compound, mastic, texture coating, acoustic ceiling tiles, caulking and putty material.

3.1.3 Findings

Laboratory results by PLM and PLM (NOB) analysis indicate that asbestos is present in twenty (20) samples with concentrations greater than 0.5% asbestos by weight. Identified ACMs include pipe insulation, plaster, vinyl flooring, expansion joint compound and window putty.

The following asbestos containing materials, including estimated quantities, were identified by the HAZMAT Survey:

- Approximately 275 m² of texture coating materials identified as ACM were noted in the subject building (samples AS-12, AS-15 and AS-20). It should be noted that based on sampling results, all texture coating material should be treated as an ACM;
- Approximately 170 linear meters of asbestos containing straight run pipe insulation was noted throughout the building (Samples AS-11, AS-24 and AS-27). It should be noted that, solid walls and ceilings limited observation of pipe insulation in multiple rooms throughout the building during the assessment. Additional asbestos containing pipe insulation may be present in concealed locations in the subject building;
- Approximately 110 pipe elbows with grey parging cement identified as ACM (Samples AS-08, AS-09 and AS-26) associated with piping were noted in the subject building, all pipe elbows that are not fiberglass should be assumed asbestos containing. It should be noted that, solid walls and ceilings limited observation of pipe insulation in multiple rooms throughout the building during the assessment. Additional asbestos containing pipe insulation may be present in concealed locations in the subject building;
- Room 130 was identified as having ACM flooring. Tan vinyl sheet flooring covering older vinyl floor tile materials were both identified to be asbestos containing. Approximately 25 m² of vinyl flooring materials were identified in Room 130 (samples AS-13 and AS-14);
- Room 107 was identified as having ACM flooring. Tan vinyl floor tile materials were identified to be asbestos containing. Approximately 22.5 m² of vinyl flooring materials were identified in Room 107 (sample AS-36);
- The bathroom located in Room 105 was identified to have an ACM lighting heat shield within (Sample AS-34). Any units similar to this with heat shields should also be considered asbestos containing;

- Window caulking identified as an ACM was noted on the interior of the Men's Washroom window (sample AS-19);
- Cementitious material (transite) identified as containing asbestos was observed on the interior and exterior of the building (Sample EXT-AS-01). One panel was observed within the south-wing Hallway ceiling cavity. All transite material in the subject building should be managed as an ACM. Approximately 2-5 m² was observed in the building interior ceiling cavity. Transite panels were also observed on the building exterior between windows and above doors. Approximately 12-15 m² was observed on the building exterior;
- Expansion joint material identified as asbestos containing was observed on the interior and exterior of the building (Sample AS-28 and EXT-AS-03). Room 110 has approximately 8 linear meters of compound between brick and structural steel within the room. Any other areas found to have the same material between two building components should be considered as an ACM. Expansion joint compound was also observed and collected from the between a seam on the brick wall of the building exterior. The material was also found to contain asbestos; and,
- Exterior caulking was collected from the building and found to contain asbestos (Sample EXT-AS-06). The material was collected from the seam between a door frame and brick wall. Any caulking materials found on the building exterior matching the description of the above noted sample should be considered as asbestos containing.

Congested ceiling spaces and concealed ceiling and wall cavities limited visual assessment for asbestos containing materials in these spaces. Additional ACMs may be present in these spaces.

CBCL's asbestos Survey findings are summarized on Figures 1 and 2, Appendix A and in Table 1, Appendix B. Laboratory certificates are located in Appendix C.

3.1.4 Recommendations

Identified ACMs as well as materials that are visually similar to the identified ACMs should be managed as asbestos containing materials. Asbestos containing materials in deteriorated condition (including associated dust and debris) or those to be affected by proposed renovation or demolition activities should be appropriately repaired or removed by a qualified contractor using appropriate precautions to reduce the potential for the release of airborne asbestos fibres. The specific level of precautions (Type 1, Type 2, or Type 3) to be implemented depends on the type of ACM (friable/non-friable), the quantity of material and the repair/removal method. General extents and recommendations for handling and removal of asbestos containing materials are presented in Table 3, Appendix B.

The general overall condition of piping insulation observed throughout the building interior was fair to poor (i.e., unwrapped, deteriorating, debris). Access into ceiling cavities should be limited to qualified personnel wearing appropriate PPE until removal or remediation of the ACM piping insulations has been completed due to loose debris and deteriorating insulations being noted in several spaces.

Transite panel was observed in one location within the south wing hallway. It is suspected that transite panels could be present in inaccessible wall and ceiling cavities throughout the building. All transite panels should be considered as asbestos containing materials.

A lighting heat shield was observed within the bathroom of Room 105. This heat shield was found to contain 45% Chrysotile asbestos. Any other units visually similar to this lighting heat shield (Photo 15, Photo Log) should be considered an asbestos containing material.

Contractors must implement appropriate health and safety precautions that meet all applicable legislation when working with materials that contain asbestos (at any concentration). These precautions will include donning appropriate personal protective equipment (PPE) and the use of appropriate health and safety measures suitable to mitigate exposure to asbestos. Following removal, asbestos containing materials must be appropriately packaged, transported and disposed of at an approved facility with prior approval from the facility operator.

3.2 Metal Containing Paint and Coatings (MCP/C)

The following sections discuss referenced guidelines for evaluating metal containing paints and coatings.

It should be noted that, in general, if metal containing paint is well adhered to a metal substrate, it can be sent together with the substrate, for metal recycling, rather than for disposal at the time of removal, with prior approval from the facility operator.

3.2.1 Lead

Lead was commonly used in paints for its association with pigments, drying agents and corrosion inhibitors. Areas of deteriorated surface coating exhibiting flaking or peeling have the potential to release lead dust or lead flakes which can be inhaled or ingested by occupants resulting in adverse health effects.

It should be noted that definitions of lead based surface coatings vary in Canada. In 2010, the Surface Coatings Materials Regulation (SOR/2005-109) made under the Canadian *Hazardous Products Act (HPA)* imposed restrictions on paints that have a concentration above 90 mg/kg of lead by weight with several exceptions noted (e.g., anti-corrosive or anti-weathering coatings, touch up coatings for metal surfaces, traffic signs, etc.). This does not specifically address surface coatings on existing surfaces.

It is possible that any concentration of lead in a surface coating can be hazardous depending on the methods used to remove it. As such it is important that precautions and PPE be utilized that are appropriate for the method of disturbance (e.g., scraping versus grinding). The American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) for worker exposure to lead (expressed as a time-weighted average), is 0.05 mg/m³. This is considered to be the concentration of a substance to which most workers can be exposed without adverse effects.

Nova Scotia Environment's Landfill Disposal Guideline for lead is 1,000 mg/kg (ppm). Painted materials with a lead concentration of less than 1,000 mg/kg may be disposed of as C&D waste at an approved disposal site. If the paint has a lead concentration greater than 1,000 mg/kg, leachate analysis must be performed. If the lead leachate concentration is greater than 5 mg/L, the paint must be disposed of at a licensed hazardous waste disposal facility. As there are no hazardous waste disposal facilities in Nova

Scotia, these materials would have to be shipped out of province for disposal. If the lead leachate concentration is below 5 mg/L the paint can be disposed of at an approved disposal site in Nova Scotia.

The Nova Scotia Department of Environment and Labour have two guidance documents for working with lead. They are titled “*Working with Inorganic Lead – An Information Package*” and “*Code of Practice: Working with Inorganic Lead*”. The Code of Practice applies to any material containing greater than 0.1% (1,000 mg/kg) of lead, and discusses specific workplace requirements, including the necessity of conducting an assessment to determine if “an employee is likely to inhale, ingest or absorb lead to such an extent that the health of the employee may be adversely affected.” If the assessment determines that there is the likelihood, the employer must develop a Lead Control Program that outlines air sampling, health monitoring, PPE and personal hygiene related to working with lead.

3.2.2 Findings

Four (4) paint/coating samples were collected and submitted for laboratory analysis of acid extractable (available) lead. Laboratory analytical results indicate that no collected samples were identified as lead containing paints.

CBCL’s Survey findings are summarized as follows:

Painted surfaces within the subject building were largely similar in colour and were found to be in good overall condition (i.e., well adhered to its substrate). None of the sampled paint materials were found to exceed the referenced guidelines for lead content in paint.

CBCL’s Survey findings for lead containing paints/coatings are summarized on Figure 2, Appendix A and in Table 2, Appendix B. Laboratory certificates are located in Appendix C.

3.2.3 Recommendations

Appropriate precautions, such as outlined in the *Ontario Lead on Construction Projects* guideline, Type I precautions, must be implemented when managing metal containing paints. When removing metal containing paint, a hazard evaluation must be conducted to determine if the removal method could expose the workers to paint with elevated metals or dust. Workers must implement health and safety precautions that result from the hazard evaluation and that meet all appropriate legislation. Depending on the removal method, these precautions may include donning appropriate personal protective equipment (PPE) and use of appropriate health and safety measures suitable to mitigate exposure to these hazardous materials. General extents and recommendations for handling and removal of lead containing paints/coatings are presented in Table 3, Appendix B.

Sampled paint materials found to contain concentrations of lead below the regulatory disposal guidelines can be disposed of at a NS landfill disposal facility, with prior approval from the operator.

3.3 Vermiculite

Vermiculite may be present within concealed locations in a building such as within concrete block walls and in attic spaces. No vermiculite was observed during the Survey. Non-intrusive investigations of the exterior walls did not reveal any evidence of vermiculite.

3.4 Other Mercury Containing Materials

Potential sources of mercury (other than paint) that may exist within the subject building include fluorescent light bulbs and older style thermostats.

- Four foot linear fluorescent lamps, which contain mercury vapour, were observed throughout lighting fixtures within the subject building. Spare lamps were also observed in storage boxes in various rooms in the building; and,
- Older style thermostats which contain liquid mercury vials were observed throughout the building.

Management and disposal of equipment containing mercury must be completed in accordance with applicable provincial and federal guidelines. At the time of removal, bulbs containing mercury vapour must be removed and disposed of intact (unbroken) at an approved recycling or disposal facility.

3.5 Other Lead Containing Materials

Potential sources of lead at the subject building (other than paint/coatings) include emergency and exit lighting, pipe caulking and pipe solder.

- Bell house fittings associated with drainage pipes were observed in the subject building. Bell house fittings typically have lead caulking associated with the fitting; and,
- Lead piping or metal pipes with leaded joints or solder were observed in the subject building at the time of the Survey. Concealed piping with leaded joints or solder are also present.

Disposal of materials containing lead must be completed in accordance with applicable provincial and federal guidelines. When removed, lead containing materials must be managed by a qualified contractor and recycled/disposed of at an approved facility. Lead piping, pipe with lead solder and lead caulking associated with bell house fittings can be removed together with the pipe/fitting and sent for metal recycling at the time of removal.

3.6 Polychlorinated Biphenyls (PCBs)

PCBs are regulated by Environment Canada under the PCB Regulations. PCBs are also regulated by the province of Nova Scotia under the PCB Management Regulations which is part of the NSEA.

The building was visually assessed for the presence of electrical equipment that could contain PCBs.

Fluorescent light fixtures were observed and inspected in the subject building. Approximately 10% of the lighting ballasts were visually checked for the presence of PCB containing ballasts. All inspected ballasts were non-PCB containing.

All light ballasts must be checked for PCBs prior to removal and disposal. The manufacturer's code should be compared to Environment Canada's document entitled "Identification of Lamp Ballasts Containing PCBs" (EPS2/CC/2 August 1991) for PCB identification. In situations that a label is not legible, it must be assumed to contain PCBs and disposed of appropriately.

All PCB-containing materials must be removed in accordance with the provincial PCB Management Regulations and the federal PCB Regulations. Nova Scotia landfills do not accept PCB-containing materials. PCB-containing materials must be disposed of at an approved hazardous waste disposal facility (none currently present in Nova Scotia).

3.7 Mould

Areas within the subject building were visually assessed for signs of apparent fungal (mould) growth.

Water damaged building materials were not observed throughout the subject building, however previously leaking and repaired pipes were observed in various locations through the subject building. Evidence of an actively leaking, broken pipe was observed in the ceiling cavity of Hallway (SW) outside rooms 106 and 107. No visible mould growth was observed. No sampling of mould was conducted.

Mould affected materials identified during demolition activities must be removed by a qualified contractor in accordance with practices described in the Canadian Construction Association's Guidelines for Mould Remediation. Mould affected asbestos containing materials must be managed and disposed of using precautions that are appropriate for both mould and asbestos.

3.8 Halocarbons

The Ozone Layer Protection Regulations (Nova Scotia Regulation 54/95) made under *NSEA* deals with all aspects of halocarbons. Halocarbons are also regulated federally by the Federal Halocarbon Regulations (2003) and the Ozone Depleting Substances Regulation (1998). The regulations identify a list of halocarbons, as well as specific handling procedures. Halocarbons are generally found in refrigeration and fire suppression equipment.

A refrigeration unit suspected to contain halocarbons was noted in the subject building at the time of the Survey. Multiple air conditioning units suspected to contain halocarbons were also noted throughout the building. Halocarbons must be removed by a qualified contractor prior to disposal of any refrigeration or air conditioning units.

3.9 Urea-Formaldehyde Foam Insulation (UFFI)

No suspected UFFI or indicators of UFFI applications were observed in the subject building.

3.10 Radioactive Materials

3.10.1 Radon

No sampling for radon gas was conducted as part of this Survey.

3.11 Silica

The building has concrete slab foundation and concrete block walls. Construction disturbances such as cutting, breaking or pulverizing of silica-containing products may result in exposure to airborne silica. Appropriate hygiene and personal protection measures must be developed and employed to ensure that the exposure criteria for silica does not exceed the ACGIH TLV of (0.025 mg/m³) (used by Nova Scotia Occupational Health and Safety Regulations).

Clean concrete may be disposed of at a C&D Site.

Workers must implement appropriate health and safety precautions that meet all applicable legislation. These precautions may include donning appropriate PPE and use of appropriate health and safety measures suitable to mitigate silica dust exposure. The Ontario Guideline- *Silica on Construction Projects* may be referenced for appropriate procedures to implement during removal of concrete.

CHAPTER 4 **LIMITATIONS**

The results presented in this report are indicative of the observations recorded and samples collected at the time and places noted in this report. Every effort was made to collect samples which were representative of potential hazardous building materials. Intrusive sampling was completed in select locations during the Survey and while there is no evidence to suggest otherwise, it is possible that hidden hazardous materials may not have been observed or sampled during the Survey. It is possible that asbestos fibres are not evenly distributed in a material and therefore the results of this Survey are thought to be indicative of other similar materials but may not be entirely identical.

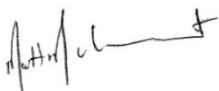
The opinions contained in this report are based upon accepted professional principals but should not be interpreted as legal or medical advice or as a guarantee or warranty regarding potential liability associated with conditions at this site.

Any use that a third party makes of this report, or any reliance on, or decisions made based upon it, are the responsibility of such third parties. CBCL Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made based upon this report.

Should additional information become available, CBCL Limited requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

Respectfully Submitted,

CBCL Limited



Prepared by:
Matt McClement
Environmental Technician

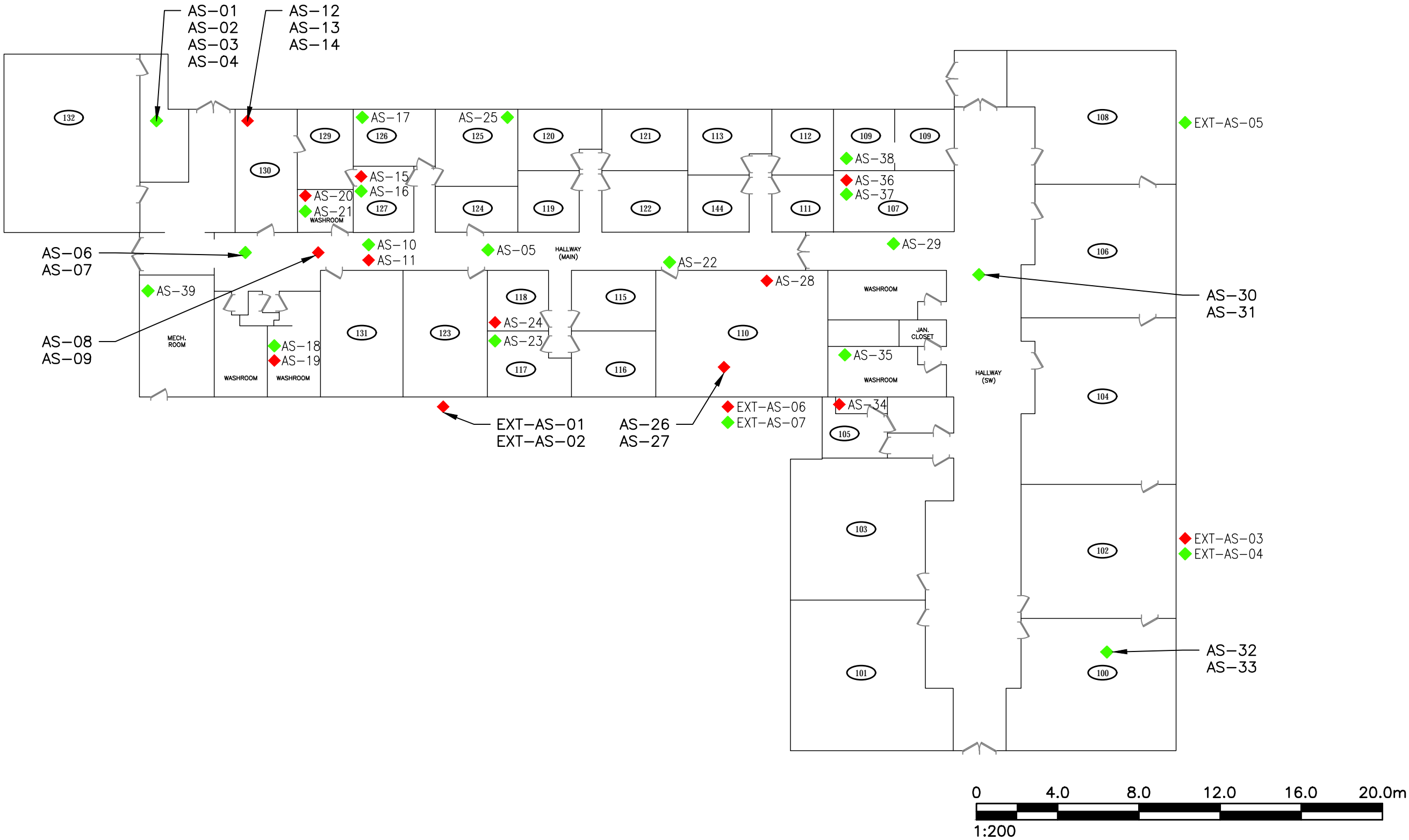


Reviewed by:
Stephanie Kilfoil, B.Sc., P.Eng.
Senior Environmental Engineer

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Figures of Sample Locations

DRAWING NAME: K:\PROJECTS\181255.00 HAZMAT SURVEY\ELMSDALE HIGH\20 CAD\07 ENVIRON\181255.00 - HAZMAT.DWG LAYOUT NAME: FIGURE 1 PLOT DATE: February-05-19 8:45:52 AM CAD OPERATOR: RMAYER



- ◆ ASBESTOS SAMPLE - NON ACM
- ◆ ASBESTOS SAMPLE - BELOW GUIDELINES
- ◆ ASBESTOS SAMPLE - ABOVE GUIDELINES

Date
JAN 2019

Scale
1:200

Designed
MM

Drawn
RM

Checked
MM

Approved
SK

CBCL No.
181255.00

Contract
-



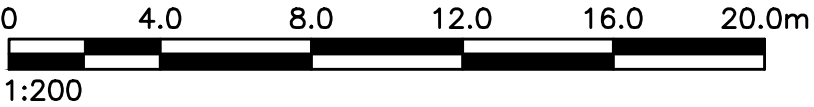
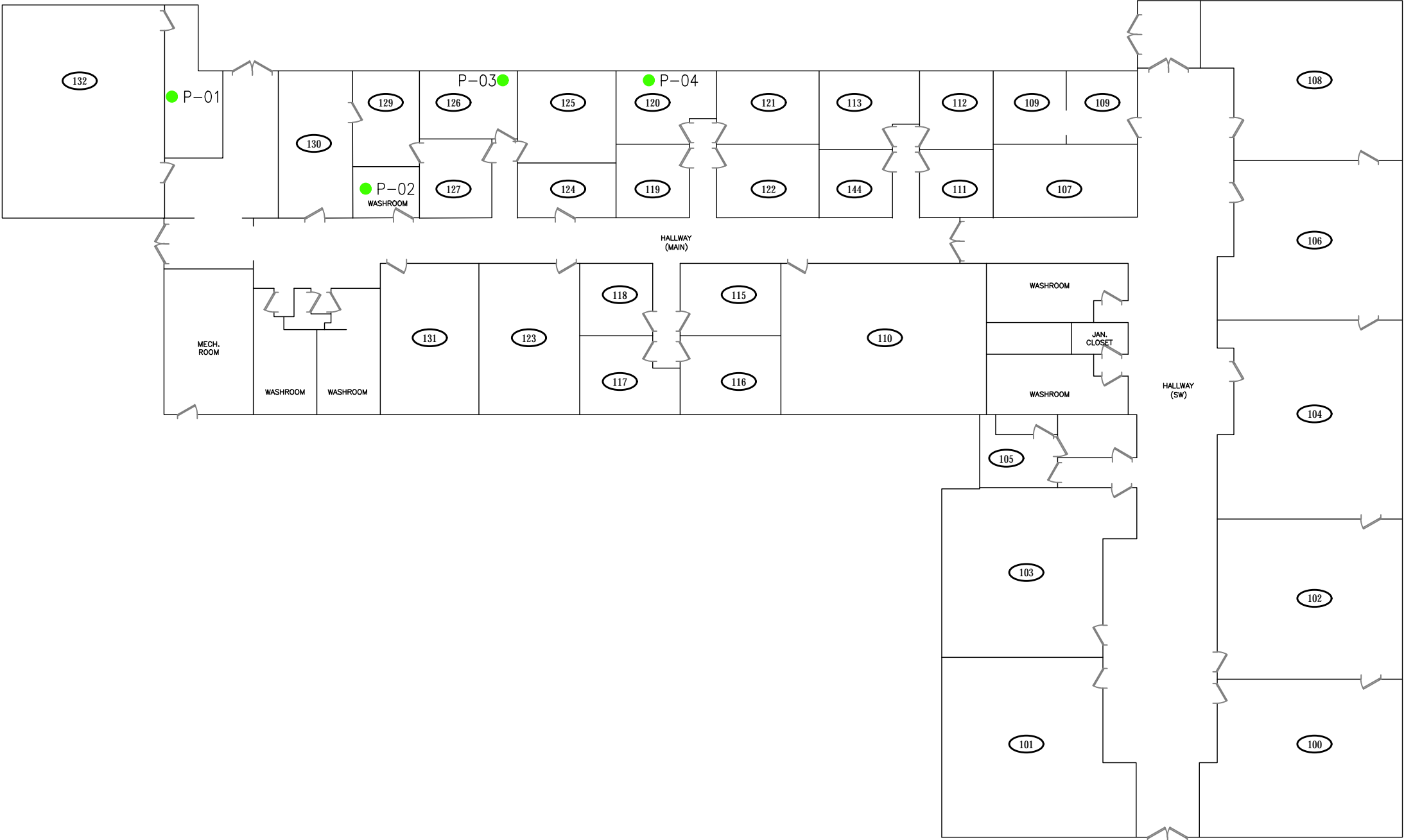
ELMSDALE HIGH HAZMAT SURVEY, ELMSDALE, NS

ASBESTOS SAMPLE LOCATIONS


Drawing

1

DRAWING NAME: K:\PROJECTS\181255.00 HAZMAT SURVEY\ELMSDALE HIGH\20 CAD\07 ENVIRON\181255.00 - HAZMAT.DWG LAYOUT NAME: FIGURE 2 PLOT DATE: January-16-19 11:29:18 AM CAD OPERATOR: RMAYER



● PAINT SAMPLE – BELOW GUIDELINES

Date JAN 2019	Scale 1:200	Designed MM	Drawn RM	Checked MM	Approved SK	CBCL No. 181255.00	Contract –
 CBCL LIMITED <u>Consulting Engineers</u>		ELMSDALE HIGH HAZMAT SURVEY, ELMSDALE, NS					Drawing 2
		PAINT SAMPLE LOCATIONS					

Hazardous Materials Summary Tables

TABLE 1:	ASBESTOS CONTAINING MATERIALS			
BUILDING:	CCAHS Elmsdale			
LOCATION:	224 Highway 214, Elmsdale, NS			
PROJECT NO.:	181255.00			
Sample #	Location	Description	Friable/Non-Friable	Asbestos Present, Total % Asbestos
				Guideline - 0.51
CBCL Limited Survey Findings (December 2018)				
AS-01	Closet off Room 132, Ceiling	Ceiling Tile - Pinhole with Fissure	Friable	NAD
AS-02	Closet off Room 132, Wall	Drywall Joint Compound	Potentially Friable	NAD
AS-03	Closet off Room 132, Floor	1x1 Floor Tile, Grey with Streak	Non-Friable	NAD
AS-03	Closet off Room 132, Floor	1x1 Floor Tile, Mastic	Non-Friable	NAD
AS-04	Closet off Room 132, Wall	Baseboard Mastic	Non-Friable	NAD
AS-05	Hallway (Main), Ceiling	Ceiling Tile - Small / Medium Hole Pattern	Friable	NAD
AS-06	Hallway (Main), Wall	Texture Coating on Concrete	Non-Friable	NAD
AS-07	Hallway (Main), Ceiling Cavity	Barrier Paper (Old F/G)	Non-Friable	NAD
AS-08	Hallway (Main), Piping	Piping Insulation, Fitting (EXP)	Friable	60% Chrysotile
AS-09	Hallway (Main), Piping	Piping Insulation, Fitting	Friable	65% Chrysotile
AS-10	Hallway (Main), Piping	Piping Insulation, Straight Run	Friable	NAD
AS-11	Hallway (Main), Piping	Piping Insulation, Straight Run	Friable	60% Chrysotile
AS-12	Room 130, Ceiling	Texture Coating	Potentially Friable	2% Chrysotile
AS-13	Room 130, Floor	Vinyl Sheet Flooring, Tan	Non-Friable	10.3% Chrysotile
AS-14	Room 130, Floor	Old Flooring Material below Tan VSF	Non-Friable	6.4% Chrysotile
AS-15	Room 127, Ceiling	Texture Coating	Potentially Friable	1% Chrysotile
AS-16	Room 127, Walls	Concrete Block Mortar	Non-Friable	NAD
AS-17	Room 126, Floor	1x1 Floor Tile, Lt. Blue with White Streak	Non-Friable	NAD
AS-18	Men's Washroom, Floor	1x1 Floor Tile, Beige with Brown Streak	Non-Friable	NAD
AS-19	Men's Washroom, Window	Caulking Material	Non-Friable	2.0% Chrysotile
AS-20	Staff Washroom, Ceiling	Texture Coating, Texture	Potentially Friable	2.0% Chrysotile
AS-20	Staff Washroom, Ceiling	Texture Coating, Skim Coat	Potentially Friable	NAD
AS-21	Staff Washroom, Wall	Drywall Joint Compound	Potentially Friable	NAD
AS-22	Hallway, Doorways	Floor Tile Material, Black	Non-Friable	NAD
AS-23	Room 117, Wall	Drywall Joint Compound	Potentially Friable	NAD
AS-24	Room 118, Piping	Wrap on Piping Insulation, Straight Run	Non-Friable	NAD
AS-24	Room 118, Piping	Tar Paper on Piping Insulation, Straight Run	Non-Friable	8% Chrysotile
AS-25	Room 120, Wall	Drywall Joint Compound	Potentially Friable	NAD
AS-26	Room 110, Piping	Piping Insulation, Fitting	Friable	55% Chrysotile
AS-27	Room 110, Piping	Piping Insulation, Straight Run Air-Cell	Friable	65% Chrysotile
AS-28	Room 110, Wall	Expansion Joint Compound, White	Non-Friable	0.27% Chrysotile
AS-28	Room 110, Wall	Expansion Joint Compound, Grey	Non-Friable	1.9% Chrysotile
AS-29	Hallway (SW), Floor	1x1 Floor Tile Beige with Brown Streak	Non-Friable	NAD
AS-30	Hallway (SW), Ceiling	Ceiling Tile, Pinhole Pattern	Friable	NAD
AS-31	Hallway (SW), Ceiling/Wall Cavity	Barrier Paper	Non-Friable	NAD
AS-32	Room 100, Ceiling Cavity	Barrier Paper on Structural Concrete	Non-Friable	NAD
AS-33	Room 100, Floor	1x1 Floor Tile, Lt Green	Non-Friable	NAD
AS-34	Room 105 (Bathroom), Ceiling	Heat Shield, Lighting Unit	Friable	45% Chrysotile
AS-35	Men's Washroom (SW), Ceiling	Ceiling Tile, Multi-Sized Pinhole Pattern	Friable	NAD
AS-36	Room 107, Floor	1x1 Floor Tile, Tan	Non-Friable	0.53% Chrysotile
AS-37	Room 107, Piping	Piping Insulation, Roof Drain Fitting	Friable	NAD

TABLE 1:	ASBESTOS CONTAINING MATERIALS			
BUILDING:	CCAHS Elmsdale			
LOCATION:	224 Highway 214, Elmsdale, NS			
PROJECT NO.:	181255.00			
Sample #	Location	Description	Friable/Non-Friable	Asbestos Present, Total % Asbestos
				Guideline - 0.5 ₁
CBCL Limited Survey Findings (December 2018)				
AS-38	Room 109, Wall	Drywall Joint Compound	Potentially Friable	NAD
AS-39	Mechanical Room, Chimney	Brick Mortar	Non-Friable	NAD
EXT-AS-01	Building Exterior, Wall	Transite Panel	Non-Friable	13.6% Chrysotile
EXT-AS-02	Building Exterior, Wall	Caulking Around Transite Panel	Non-Friable	2.2% Chrysotile
EXT-AS-03	Building Exterior, Wall	Expansion Joint Compound, White	Non-Friable	1.2% Chrysotile
EXT-AS-03	Building Exterior, Wall	Expansion Joint Compound, Black	Non-Friable	0.76% Chrysotile
EXT-AS-04	Building Exterior, Window	Window Glazing, Grey	Non-Friable	NAD
EXT-AS-05	Building Exterior, Wall	Brick Mortar	Non-Friable	NAD
EXT-AS-06	Building Exterior, Door	Caulking, Grey	Non-Friable	1.2% Chrysotile
EXT-AS-07	Building Exterior, Window	Caulking, Black	Non-Friable	NAD
Notes:				
¹ . Nova Scotia Department of Labour and Advanced Education's <i>Asbesetos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace</i> defines an asbestos-containing materials as one that contains 0.5% asbestos by weight.				
Bold and Shaded Result	Exceeds guideline and is therefore considered an asbestos containing material.			
Bold Results	Asbestos identified below regulatory guidelines			

TABLE 2:	METAL CONTAINING PAINTS/COATINGS
BUILDING:	CCAHS Elmsdale
LOCATION:	224 Highway 214, Elmsdale, NS
PROJECT NO.:	181255.00

Sample #	Location, Description, Condition	Metals	Lead	Mercury	Arsenic
		Units	mg/kg	mg/kg	mg/kg
		Disposal Guideline ¹	1000	10	50
CBCL Limited Survey Findings (March 2013)					
P-01	Closet off Room 132, Wall Paint, Tan		<5.0	<1.0	<10
P-01 Lab Dup	Closet off Room 132, Wall Paint, Tan		<5.0	<1.0	<10
P-02	Staff Washroom, Ceiling Paint, White		49	<1.0	<10
P-03	Room 126, Wall Paint, Medium Tan		<5.0	<1.0	<10
P-04	Room 120, Wall Paint, Cream		<5.0	<1.0	<10
P-04 Lab Dup	Room 120, Wall Paint, Cream		<5.0	<1.0	<10
Notes:					
¹ Surface Coating Material Regulations (SOR/2016-193)					
² CCME Soil Quality Guideline for the Protection of Human Health					
³ NSE Guidelines for Disposal of Contaminated Solids in Landfills					
N/A – Not applicable as samples not submitted for analysis					
Bold	Concentration of extractable metal exceeds referenced Surface Coating Materials Regulation				
<u>Bold and Underlined</u>	Concentration of extractable metal exceeds NS Landfill Disposal Criteria				
<u>Bold and Underlined</u>	Concentration of leachable metal exceeds NS Landfill Disposal Criteria (leachate hazardous)				

Table 3:	Hazardous Materials Requiring Special Handling				
Building:	CCAHS Elmsdale				
Location:	224 Highway 214, Elmsdale, NS				
Project No.	181255.00				
Building Materials	Hazardous Material	Description	Approximate Quantity	Regulatory Guideline (follow most stringent)	Comments
Texture Coatings and Associated Dust	Potentially Friable Asbestos	All texture coating material finishes throughout the building including associated dust/debris in locations where these materials are found in deteriorated condition.	Approximately 275 m² of ceilings are covered with texture coating finish.	<p>The Nova Scotia Department of Labour and Advanced Education, under the Occupational Health and Safety Act, have various Codes of Practice that must be followed while working with hazardous materials with regard to worker safety. When dealing with asbestos, the following apply: Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace; Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material, and the Nova Scotia Asbestos Waste Mangement Regulation 53/95.</p> <p>The Nova Scotia Asbestos Waste Management Regulations governs the management, maintenance, handling and removal of asbestos containing materials. This regulation is under the authority of the Environment Act and is administered by the Department of Environment. According to the regulations asbestos material is defined as a friable waste material containing asbestos fibres or asbestos dust in a concentration greater than 0.5% asbestos by weight.</p>	<p>Potentially friable asbestos containing texture coating and associated dust/debris indentified throughout the subject building must be removed and disposed of in accordance with the applicable NS guides and regulations.</p> <p>Workers must complete a job hazard analysis and implement appropriate health and safety precautions that meet all applicable legislation when working with materials that contain asbestos (at any concentration).</p> <p>Materials containing asbestos must be disposed of at an approved facility with prior approval from the facility operator, in accordance with the Nova Scotia Asbestos Waste Management Regulations.</p>
Vinyl Sheet Flooring	Non-friable Asbestos	Vinyl sheet flooring materials located in Room 130 within the subject building.	Approximately 25 m² of vinyl sheet flooring material was identified as being asbestos containing throughout the subject building.	<p>The Nova Scotia Department of Labour and Advanced Education, under the Occupational Health and Safety Act, have various Codes of Practice that must be followed while working with hazardous materials with regard to worker safety. When dealing with asbestos, the following apply: Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace; Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material, and the Nova Scotia Asbestos Waste Mangement Regulation 53/95.</p> <p>The Nova Scotia Asbestos Waste Management Regulations governs the management, maintenance, handling and removal of asbestos containing materials. This regulation is under the authority of the Environment Act and is administered by the Department of Environment. According to the regulations asbestos material is defined as a friable waste material containing asbestos fibres or asbestos dust in a concentration greater than 0.5% asbestos by weight.</p>	<p>Non-friable asbestos containing vinyl floor materials indentified throughout the subject building must be removed and disposed of in accordance with the applicable NS guides and regulations.</p> <p>Workers must complete a job hazard analysis and implement appropriate health and safety precautions that meet all applicable legislation when working with materials that contain asbestos (at any concentration).</p> <p>Materials containing asbestos must be disposed of at an approved facility with prior approval from the facility operator, in accordance with the Nova Scotia Asbestos Waste Management Regulations.</p>
Tan Vinyl Floor Tile (12"x12")	Non-friable Asbestos	Vinyl floor tile materials located in Room 107 within the subject building.	Approximately 22.5 m² of vinyl floor tile was identified as being asbestos containing throughout the subject building.	<p>The Nova Scotia Department of Labour and Advanced Education, under the Occupational Health and Safety Act, have various Codes of Practice that must be followed while working with hazardous materials with regard to worker safety. When dealing with asbestos, the following apply: Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace; Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material, and the Nova Scotia Asbestos Waste Mangement Regulation 53/95.</p> <p>The Nova Scotia Asbestos Waste Management Regulations governs the management, maintenance, handling and removal of asbestos containing materials. This regulation is under the authority of the Environment Act and is administered by the Department of Environment. According to the regulations asbestos material is defined as a friable waste material containing asbestos fibres or asbestos dust in a concentration greater than 0.5% asbestos by weight.</p>	<p>Non-friable asbestos containing vinyl floor indentified throughout the subject building must be removed and disposed of in accordance with the applicable NS guides and regulations.</p> <p>Workers must complete a job hazard analysis and implement appropriate health and safety precautions that meet all applicable legislation when working with materials that contain asbestos (at any concentration).</p> <p>Materials containing asbestos must be disposed of at an approved facility with prior approval from the facility operator, in accordance with the Nova Scotia Asbestos Waste Management Regulations.</p>
Piping and Mechanical Insulations	Friable Asbestos	Straight run pipe insulation and parging cement associated with elbows/tees/joints, etc. on mechanical piping throughout the building interior.	<p>Approximately 170 linear meters of asbestos containing straight run pipe insulation was noted through the building interior.</p> <p>Approximately 110 readily visible pipe elbows with parging cement were noted. The majority of the elbows with parging cement identified were elbows found to be in fair to poor condition (unwrapped and deteriorating).</p> <p>Piping is not readily visible in a number of locations throughout the building (i.e., solid ceiling and wall cavities) and as such, additional asbestos containing materials associated with this mechanical piping system may be present.</p>	<p>The Nova Scotia Department of Labour and Advanced Education, under the Occupational Health and Safety Act, have various Codes of Practice that must be followed while working with hazardous materials with regard to worker safety. When dealing with asbestos, the following apply: Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace; Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material, and the Nova Scotia Asbestos Waste Mangement Regulation 53/95.</p> <p>The Nova Scotia Asbestos Waste Management Regulations governs the management, maintenance, handling and removal of asbestos containing materials. This regulation is under the authority of the Environment Act and is administered by the Department of Environment. According to the regulations asbestos material is defined as a friable waste material containing asbestos fibres or asbestos dust in a concentration greater than 0.5% asbestos by weight.</p>	<p>Friable asbestos containing mechanical insulations indentified throughout the subject building must be removed and disposed of in accordance with the applicable NS guides and regulations.</p> <p>Workers must complete a job hazard analysis and implement appropriate health and safety precautions that meet all applicable legislation when working with materials that contain asbestos (at any concentration).</p> <p>Materials containing asbestos must be disposed of at an approved facility with prior approval from the facility operator, in accordance with the Nova Scotia Asbestos Waste Management Regulations.</p>
Lighting Heat Shield	Friable Asbestos	Heat shield identified on the light unit within the small bathroom in Room 105.	One (1) light unit was observed during the building assessment. Any units matching the light found in this location should also be considered as asbestos containing.	<p>The Nova Scotia Department of Labour and Advanced Education, under the Occupational Health and Safety Act, have various Codes of Practice that must be followed while working with hazardous materials with regard to worker safety. When dealing with asbestos, the following apply: Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace; Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material, and the Nova Scotia Asbestos Waste Mangement Regulation 53/95.</p> <p>The Nova Scotia Asbestos Waste Management Regulations governs the management, maintenance, handling and removal of asbestos containing materials. This regulation is under the authority of the Environment Act and is administered by the Department of Environment. According to the regulations asbestos material is defined as a friable waste material containing asbestos fibres or asbestos dust in a concentration greater than 0.5% asbestos by weight.</p>	<p>Friable asbestos containing heat shields indentified throughout the subject building must be removed and disposed of in accordance with the applicable NS guides and regulations.</p> <p>Workers must complete a job hazard analysis and implement appropriate health and safety precautions that meet all applicable legislation when working with materials that contain asbestos (at any concentration).</p> <p>Materials containing asbestos must be disposed of at an approved facility with prior approval from the facility operator, in accordance with the Nova Scotia Asbestos Waste Management Regulations.</p>

Table 3:	Hazardous Materials Requiring Special Handling				
Building:	CCAHS Elmsdale				
Location:	224 Highway 214, Elmsdale, NS				
Project No.	181255.00				
Building Materials	Hazardous Material	Description	Approximate Quantity	Regulatory Guideline (follow most stringent)	Comments
Transite Material	Non-friable Asbestos	Transite panels observed in ceiling cavity of south wing Hallway and observed on the building exterior between windows and above doors.	Approximately 12-15 m ² of asbestos containing transite panels were noted on the building exterior. The material was observed between windows and used as soffits above doorways. Approximately 2-5 m ² of asbestos containing transite panels were noted within the building interior. The material was observed within the ceiling cavity of the south wing hallway. Transite materials may be present in concealed locations within the building interior which were inaccessible during the assessment (i.e. behind solid walls and ceilings).	The Nova Scotia Department of Labour and Advanced Education, under the Occupational Health and Safety Act, have various Codes of Practice that must be followed while working with hazardous materials with regard to worker safety. When dealing with asbestos, the following apply: Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace; Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material, and the Nova Scotia Asbestos Waste Mangement Regulation 53/95. The Nova Scotia Asbestos Waste Management Regulations governs the management, maintenance, handling and removal of asbestos containing materials. This regulation is under the authority of the Environment Act and is administered by the Department of Environment. According to the regulations asbestos material is defined as a friable waste material containing asbestos fibres or asbestos dust in a concentration greater than 0.5% asbestos by weight.	Non-friable asbestos containing transite panel materials indentified throughout the subject building must be removed and disposed of in accordance with the applicable NS guides and regulations. Workers must complete a job hazard analysis and implement appropriate health and safety precautions that meet all applicable legislation when working with materials that contain asbestos (at any concentration). Materials containing asbestos must be disposed of at an approved facility with prior approval from the facility operator, in accordance with the Nova Scotia Asbestos Waste Management Regulations.
Caulkings / Expansion Joint Compound	Non-friable Asbestos	Expansion joint materials found in Room 110 and on the building exterior. Any material resembling the description or function of the sampled expansion joint compound should be considered as an asbestos containing material. Caulking materials found on windows and doors on the building interior and exterior.	Not Quantified.	The Nova Scotia Department of Labour and Advanced Education, under the Occupational Health and Safety Act, have various Codes of Practice that must be followed while working with hazardous materials with regard to worker safety. When dealing with asbestos, the following apply: Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace; Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material, and the Nova Scotia Asbestos Waste Mangement Regulation 53/95. The Nova Scotia Asbestos Waste Management Regulations governs the management, maintenance, handling and removal of asbestos containing materials. This regulation is under the authority of the Environment Act and is administered by the Department of Environment. According to the regulations asbestos material is defined as a friable waste material containing asbestos fibres or asbestos dust in a concentration greater than 0.5% asbestos by weight.	Non-friable asbestos containing caulking and expansion joint compound materials indentified throughout the ointerior and exterior of the subject building must be removed and disposed of in accordance with the applicable NS guides and regulations. Workers must complete a job hazard analysis and implement appropriate health and safety precautions that meet all applicable legislation when working with materials that contain asbestos (at any concentration). Materials containing asbestos must be disposed of at an approved facility with prior approval from the facility operator, in accordance with the Nova Scotia Asbestos Waste Management Regulations.
Mercury Thermostats and Fluorescent Light Tubes	Mercury	Thermostats containing mercury vials and fluorescent light bulbs throughout building	Not Quantified.	Nova Scotia Guidelines for the Disposal of Contaminated Solids in Landfills (2016).	Management and disposal of equipment containing mercury must be completed in accordance with applicable provincial and federal guidelines. Mercury containing equipment must be removed by a qualified contractor, appropriately packaged and sent for recycling/disposal at a facility that accepts mercury containing materials. It
Fluorescent light ballasts	These ballasts if manufactured prior to 1978 may contain PCBs	Fluorescent light ballasts in the building interior.	Not Quantified.	Nova Scotia Guidelines for the Disposal of Contaminated Solids in Landfills (2016).	Light ballasts should be checked to confirm the presence/absence of PCBs at the time of removal. Qualified contractor to remove/handle/store/transport any PCB containing light ballasts as per the TDG Regulations, as to not break or damage them. Ballasts containing PCBs to be disposed of at a licensed facility.
Poured concrete, concrete products, cement mortars used in the building construction	Silica Dust	Poured slabs, foundations, mortar.	Not Quantified.	Nova Scotia Occupational Exposure Limits. Ontario Ministry of Labour- Occupational Health and Safety Branch. April 2011. Guideline- Silica on Construction Projects	Construction disturbances such as cutting, breaking or pulverizing of silica-containing products may result in exposure to airborne silica. Appropriate hygiene and personal protection measures must be developed and employed to ensure that the exposure criteria for silica does not exceeded the ACGIH TLV of (0.025 mg/m ³) (used by Nova Scotia Occupational Health and Safety Regulations).
Refrigeration and Air Conditioning units	Halocarbons	Refrigeration and Air Conditioning units	Not Quantified.	The Ozone Layer Protection Regulations (Nova Scotia Regulation 54/95) made under <i>NSEA</i> deals with all aspects of halocarbons. Halocarbons are also regulated federally by the Federal Halocarbon Regulations (2003) and the Ozone Depleting Substances Regulation (1998). The regulations identify a list of halocarbons, as well as specific handling procedures. Halocarbons are generally found in refrigeration and fire suppression equipment.	A refrigeration unit suspected to contain halocarbons was noted in the subject building at the time of the Survey. Multiple air conditioning units suspected to contain halocarbons were also noted throughout the building. Halocarbons must be removed by a qualified contractor prior to disposal of any refrigeration or air conditioning units.
Notes:					
Non-issue items (not identified above) may be taken to a C&D site or be recycled at contractors' discretion.					
Should a material suspected to contain asbestos fibres become uncovered during demolition activities, all work in the areas that may disturb the material must be stopped. Samples of the suspected material shall be submitted for laboratory analysis to determine if asbestos fibres are present. Confirmed asbestos-containing materials must be handled in accordance with the procedures outlined in the Nova Scotia Code of Practice/Guidelines.					

Laboratory Certificates



EMSL Canada Inc.

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

EMSL Canada Order 551815077
Customer ID: 55CBCH34
Customer PO: 181255.00
Project ID:

Attn: Kelly MacDougall
CBCL, LTD.
1489 Hollis street
P.O. Box 606
Halifax, NS B3L 2R7
Proj: 181255.00

Phone: (902) 421-7241
Fax: (902) 423-3938
Collected: 12/17/2018
Received: 12/20/2018
Analyzed: 12/27/2018

Test Report: Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace via EPA600/R-93/116 Method

Client Sample ID: AS-01 **Lab Sample ID:** 551815077-0001

Sample Description: Ceiling Tile - Pinhole w/ Fissure Closet Off Room 132

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	75.0%	25.0%	None Detected	

Client Sample ID: AS-02 **Lab Sample ID:** 551815077-0002

Sample Description: Drywall Joint Compound - Wall Closet Off Room 132

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Beige	0.0%	100.0%	None Detected	

Client Sample ID: AS-03-Floor Tile **Lab Sample ID:** 551815077-0003

Sample Description: 1x1 Floor Tile - Grey w/ Streak - Closet Off Room 132

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	100%	None Detected	

Client Sample ID: AS-03-Mastic **Lab Sample ID:** 551815077-0003A

Sample Description: 1x1 Floor Tile - Grey w/ Streak - Closet Off Room 132

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Black	0.0%	100%	None Detected	

Client Sample ID: AS-04 **Lab Sample ID:** 551815077-0004

Sample Description: Baseboard Mastic - Wall Closet Off Room 132

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: AS-05 **Lab Sample ID:** 551815077-0005

Sample Description: Ceiling Tile - Sm Hole w/ Med Hole - Hallway (Main)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	75.0%	25.0%	None Detected	

Client Sample ID: AS-06 **Lab Sample ID:** 551815077-0006

Sample Description: Texture Coating - Walls Hallway (Main)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	White	0.0%	100.0%	None Detected	



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Test Report: Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace via EPA600/R-93/116 Method

Client Sample ID: AS-07 **Lab Sample ID:** 551815077-0007

Sample Description: Barrier Paper (old F/G) - Ceiling Cavity Hallway (Main)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Brown/Black	80.0%	20.0%	None Detected	

Client Sample ID: AS-08 **Lab Sample ID:** 551815077-0008

Sample Description: Piping Insulation - Fitting (Exp) Hallway (Main)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	0.0%	40.0%	60% Chrysotile	

Client Sample ID: AS-09 **Lab Sample ID:** 551815077-0009

Sample Description: Piping Insulation - Fitting Hallway (Main)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	0.0%	35.0%	65% Chrysotile	

Client Sample ID: AS-10 **Lab Sample ID:** 551815077-0010

Sample Description: Piping Insulation - Straight Run Hallway (Main)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Brown	90.0%	10.0%	None Detected	

Client Sample ID: AS-11 **Lab Sample ID:** 551815077-0011

Sample Description: Piping Insulation - Straight Run (AC) Hallway (Main)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	0.0%	40.0%	60% Chrysotile	

Client Sample ID: AS-12 **Lab Sample ID:** 551815077-0012

Sample Description: Texture Coating - Ceiling Room 130

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Brown/White	0.0%	98.0%	2% Chrysotile	

Client Sample ID: AS-13 **Lab Sample ID:** 551815077-0013

Sample Description: Vinyl Sheet Flooring - Tan Room 130

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Tan	0.0%	89.7%	10.3% Chrysotile	

Client Sample ID: AS-14 **Lab Sample ID:** 551815077-0014

Sample Description: Old Flooring Below VSF - Red Room 130

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Red	0.0%	93.6%	6.4% Chrysotile	



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Test Report: Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace via EPA600/R-93/116 Method

Client Sample ID: AS-15 **Lab Sample ID:** 551815077-0015

Sample Description: Texture Coating - Ceiling Room 127

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	White	0.0%	99.0%	1% Chrysotile	

Client Sample ID: AS-16 **Lab Sample ID:** 551815077-0016

Sample Description: Concrete Block Mortar - Walls Room 127

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	100%	None Detected	

Client Sample ID: AS-17 **Lab Sample ID:** 551815077-0017

Sample Description: 1x1 Floor Tile - Lt. Blue w/ White Streak Room 126

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Blue	0.0%	100%	None Detected	

Client Sample ID: AS-18 **Lab Sample ID:** 551815077-0018

Sample Description: 1x1 Floor Tile - Beige w/ Brown Speck Men's Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Beige	0.0%	100%	None Detected	

Client Sample ID: AS-19 **Lab Sample ID:** 551815077-0019

Sample Description: Old Caulking - Window Men's Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	98.0%	2.0% Chrysotile	

Client Sample ID: AS-20-Texture **Lab Sample ID:** 551815077-0020

Sample Description: Texture Coating - Ceiling Staff Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	White	0.0%	98.0%	2% Chrysotile	

Client Sample ID: AS-20-Skim Coat **Lab Sample ID:** 551815077-0020A

Sample Description: Texture Coating - Ceiling Staff Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	White	0.0%	100.0%	None Detected	

Client Sample ID: AS-21 **Lab Sample ID:** 551815077-0021

Sample Description: Drywall Joint Compound - Wall Staff Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	White	0.0%	100.0%	None Detected	



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<http://www.EMSL.com> / torontolab@emsl.com

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Test Report: Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace via EPA600/R-93/116 Method

Client Sample ID: AS-22 **Lab Sample ID:** 551815077-0022
Sample Description: Black Floor Tile - Hallway to Most Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Black	0.0%	100%	None Detected	

Client Sample ID: AS-23 **Lab Sample ID:** 551815077-0023
Sample Description: Drywall Joint Compound - Wall Room 117

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	White	0.0%	100.0%	None Detected	

Client Sample ID: AS-24-Wrap **Lab Sample ID:** 551815077-0024
Sample Description: Piping Insulation - Straight Run Room 118

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Brown	90.0%	10.0%	None Detected	

Client Sample ID: AS-24-Tar Paper **Lab Sample ID:** 551815077-0024A
Sample Description: Piping Insulation - Straight Run Room 118

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Black	40.0%	52.0%	8% Chrysotile	

Client Sample ID: AS-25 **Lab Sample ID:** 551815077-0025
Sample Description: Drywall Joint Compound - Wall Room 120

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	White	0.0%	100.0%	None Detected	

Client Sample ID: AS-26 **Lab Sample ID:** 551815077-0026
Sample Description: Piping Insulation - Fitting Room 110

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	0.0%	45.0%	55% Chrysotile	

Client Sample ID: AS-27 **Lab Sample ID:** 551815077-0027
Sample Description: Piping Insulation - Straight Run (AC) Room 110

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	0.0%	35.0%	65% Chrysotile	

Client Sample ID: AS-28-White Expansion **Lab Sample ID:** 551815077-0028
Sample Description: Fill Compound - Expansion Joint Room 110

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	White	0.0%	99.7%	0.27% Chrysotile	



EMSL Canada Inc.

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

EMSL Canada Order 551815077
 Customer ID: 55CBCH34
 Customer PO: 181255.00
 Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace via EPA600/R-93/116 Method

Client Sample ID: AS-28-Grey Expansion **Lab Sample ID:** 551815077-0028A
Sample Description: Fill Compound - Expansion Joint Room 110

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	98.1%	1.9% Chrysotile	

Client Sample ID: AS-29 **Lab Sample ID:** 551815077-0029
Sample Description: 1x1 Floor Tile - Beige w/ Brown Streak Hallway (SW)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Beige	0.0%	100%	None Detected	

Client Sample ID: AS-30 **Lab Sample ID:** 551815077-0030
Sample Description: Ceiling Tile - Pinhole Hallway (SW)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	75.0%	25.0%	None Detected	

Client Sample ID: AS-31 **Lab Sample ID:** 551815077-0031
Sample Description: Barrier Paper - Wall Cavity Hallway (SW)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Black	40.0%	60.0%	None Detected	

Client Sample ID: AS-32 **Lab Sample ID:** 551815077-0032
Sample Description: Barrier Paper on Structural Concrete Ceiling Cavity - Room 100

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Brown/Black	75.0%	25.0%	None Detected	

Client Sample ID: AS-33 **Lab Sample ID:** 551815077-0033
Sample Description: 1x1 Floor Tile - Lt. Green Room 100

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Green	0.0%	100%	None Detected	

Client Sample ID: AS-34 **Lab Sample ID:** 551815077-0034
Sample Description: Light Heat Shield - Light Unit Room 105 (Bathroom)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	0.0%	55.0%	45% Chrysotile	

Client Sample ID: AS-35 **Lab Sample ID:** 551815077-0035
Sample Description: Ceiling Tile - Multi-sized Pinhole Men's Washroom (SW)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Gray	75.0%	25.0%	None Detected	



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EMSL Canada Order 551815077
Customer ID: 55CBCH34
Customer PO: 181255.00
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace via EPA600/R-93/116 Method

Client Sample ID: AS-36 **Lab Sample ID:** 551815077-0036
Sample Description: 1x1 Floor Tile - Tan Room 107

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Tan	0.0%	99.5%	0.53% Chrysotile	

Client Sample ID: AS-37 **Lab Sample ID:** 551815077-0037
Sample Description: Piping Insulation - Roof Drain Room 107

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	Brown	80.0%	20.0%	None Detected	

Client Sample ID: AS-38 **Lab Sample ID:** 551815077-0038
Sample Description: Drywall Joint Compound - Walls Room 109

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	12/27/2018	White	0.0%	100.0%	None Detected	

Client Sample ID: AS-39 **Lab Sample ID:** 551815077-0039
Sample Description: Chimney Brick Mortar - Mechanical Room

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	100%	None Detected	

Client Sample ID: EXT-AS-01 **Lab Sample ID:** 551815077-0040
Sample Description: Transite Panel - Building Exterior

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	86.4%	13.6% Chrysotile	

Client Sample ID: EXT-AS-02 **Lab Sample ID:** 551815077-0041
Sample Description: Caulking Around Transite - Grey Building Exterior

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	97.8%	2.2% Chrysotile	

Client Sample ID: EXT-AS-03-White Expansion **Lab Sample ID:** 551815077-0042
Sample Description: Expansion Joint Compound - Black Building Exterior

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	White	0.0%	98.8%	1.2% Chrysotile	

Client Sample ID: EXT-AS-03-Black Expansion **Lab Sample ID:** 551815077-0042A
Sample Description: Expansion Joint Compound - Black Building Exterior

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Black	0.0%	99.2%	0.76% Chrysotile	



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EMSL Canada Order 551815077
Customer ID: 55CBCH34
Customer PO: 181255.00
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace via EPA600/R-93/116 Method

Client Sample ID: EXT-AS-04 **Lab Sample ID:** 551815077-0043

Sample Description: Window Glaring - Grey Building Exterior

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	100%	None Detected	

Client Sample ID: EXT-AS-05 **Lab Sample ID:** 551815077-0044

Sample Description: Brick Mortar - Building Exterior

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Gray	0.0%	100%	None Detected	

Client Sample ID: EXT-AS-06 **Lab Sample ID:** 551815077-0045

Sample Description: Caulking Around Door - Grey Building Exterior

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	White	0.0%	98.8%	1.2% Chrysotile	

Client Sample ID: EXT-AS-07 **Lab Sample ID:** 551815077-0046

Sample Description: Caulking Around Window - Black Building Exterior

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	12/27/2018	Black	0.0%	100%	None Detected	

Analyst(s):

Anne Balayboa PLM Grav. Reduction (23)
Natalie D'Amico PLM (28)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

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

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

(Initial report from: 12/27/2018 14:53:31)

Your Project #: 181255.00
Site Location: ELMSDALE ADULT HIGH
Your C.O.C. #: B 136112

Attention: Kelly MacDougall

CBCL Limited
Halifax - Standing offer
1489 Hollis St
PO Box 606
Halifax, NS
CANADA B3J 2R7

Report Date: 2018/12/27
Report #: R5540628
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8Y0684

Received: 2018/12/19, 16:29

Sample Matrix: Paint
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals Paint Acid Extr. ICPMS	2	2018/12/22	2018/12/22	ATL SOP 00058	EPA 6020A R1 m

Sample Matrix: Solid
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals Bulk Acid Extr. ICPMS	2	2018/12/22	2018/12/22	ATL SOP 00058	EPA 6020A R1 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Your Project #: 181255.00
Site Location: ELMSDALE ADULT HIGH
Your C.O.C. #: B 136112

Attention: Kelly MacDougall

CBCL Limited
Halifax - Standing offer
1489 Hollis St
PO Box 606
Halifax, NS
CANADA B3J 2R7

Report Date: 2018/12/27
Report #: R5540628
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8Y0684

Received: 2018/12/19, 16:29

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Keri Mackay, Senior Project Manager

Email: kmackay@maxxam.ca

Phone# (902)420-0203 Ext:294

=====

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ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		IPG887	IPG887	IPG889		
Sampling Date		2018/12/07	2018/12/07	2018/12/07		
COC Number		B 136112	B 136112	B 136112		
	UNITS	PS-01 - TAN PAINT WALLS - CLOSET OFF 132	PS-01 - TAN PAINT WALLS - CLOSET OFF 132 Lab-Dup	PS-03 - MED TAN PAINT WALL - ROOM 126	RDL	QC Batch
Metals						
Acid Extractable Arsenic (As)	mg/kg	<10	<10	<10	10	5902812
Acid Extractable Lead (Pb)	mg/kg	<5.0	<5.0	<5.0	5.0	5902812
Acid Extractable Mercury (Hg)	mg/kg	<1.0	<1.0	<1.0	1.0	5902812
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate						

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		IPG888	IPG890	IPG890		
Sampling Date		2018/12/07	2018/12/07	2018/12/07		
COC Number		B 136112	B 136112	B 136112		
	UNITS	PS-02 - WHITE PAINT CEILING - STAFF WASH RM	PS-04 - CREAM PAINT WALL - ROOM 120	PS-04 - CREAM PAINT WALL - ROOM 120 Lab-Dup	RDL	QC Batch
Metals						
Acid Extractable Arsenic (As)	mg/kg	<10	<10	<10	10	5902813
Acid Extractable Lead (Pb)	mg/kg	49	<5.0	<5.0	5.0	5902813
Acid Extractable Mercury (Hg)	mg/kg	<1.0	<1.0	<1.0	1.0	5902813
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate						

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	13.3°C
-----------	--------

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5902812	BAN	Matrix Spike [IPG887-01]	Acid Extractable Arsenic (As)	2018/12/22		94	%	75 - 125
			Acid Extractable Lead (Pb)	2018/12/22		102	%	75 - 125
			Acid Extractable Mercury (Hg)	2018/12/22		105	%	75 - 125
5902812	BAN	Spiked Blank	Acid Extractable Arsenic (As)	2018/12/22		100	%	75 - 125
			Acid Extractable Lead (Pb)	2018/12/22		98	%	75 - 125
			Acid Extractable Mercury (Hg)	2018/12/22		103	%	75 - 125
5902812	BAN	Method Blank	Acid Extractable Arsenic (As)	2018/12/22	<10		mg/kg	
			Acid Extractable Lead (Pb)	2018/12/22	<5.0		mg/kg	
			Acid Extractable Mercury (Hg)	2018/12/22	<1.0		mg/kg	
5902812	BAN	RPD [IPG887-01]	Acid Extractable Arsenic (As)	2018/12/22	NC		%	35
			Acid Extractable Lead (Pb)	2018/12/22	NC		%	35
			Acid Extractable Mercury (Hg)	2018/12/22	NC		%	35
5902813	BAN	Matrix Spike [IPG890-01]	Acid Extractable Arsenic (As)	2018/12/22		76	%	75 - 125
			Acid Extractable Lead (Pb)	2018/12/22		82	%	75 - 125
			Acid Extractable Mercury (Hg)	2018/12/22		81	%	75 - 125
5902813	BAN	Spiked Blank	Acid Extractable Arsenic (As)	2018/12/22		100	%	75 - 125
			Acid Extractable Lead (Pb)	2018/12/22		98	%	75 - 125
			Acid Extractable Mercury (Hg)	2018/12/22		103	%	75 - 125
5902813	BAN	Method Blank	Acid Extractable Arsenic (As)	2018/12/22	<10		mg/kg	
			Acid Extractable Lead (Pb)	2018/12/22	<5.0		mg/kg	
			Acid Extractable Mercury (Hg)	2018/12/22	<1.0		mg/kg	
5902813	BAN	RPD [IPG890-01]	Acid Extractable Arsenic (As)	2018/12/22	NC		%	35
			Acid Extractable Lead (Pb)	2018/12/22	NC		%	35
			Acid Extractable Mercury (Hg)	2018/12/22	NC		%	35

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

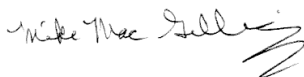
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your Project #: 181255.00
Site Location: ELMSDALE ADULT HIGH
Your C.O.C. #: B 136112

Attention: Kelly MacDougall

CBCL Limited
Halifax - Standing offer
1489 Hollis St
PO Box 606
Halifax, NS
CANADA B3J 2R7

Report Date: 2018/12/27
Report #: R5540628
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8Y0684

Received: 2018/12/19, 16:29

Sample Matrix: Paint
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals Paint Acid Extr. ICPMS	2	2018/12/22	2018/12/22	ATL SOP 00058	EPA 6020A R1 m

Sample Matrix: Solid
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals Bulk Acid Extr. ICPMS	2	2018/12/22	2018/12/22	ATL SOP 00058	EPA 6020A R1 m

Remarks:

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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key



Maxxam
27 Dec 2018 13:25:08

Your Project #: 181255.00
Site Location: ELMSDALE ADULT HIGH
Your C.O.C. #: B 136112

Attention: Kelly MacDougall

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CANADA B3J 2R7

Report Date: 2018/12/27
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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8Y0684
Received: 2018/12/19, 16:29

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Keri Mackay, Senior Project Manager
Email: kmackay@maxxam.ca
Phone# (902)420-0203 Ext:294

=====

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ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		IPG887	IPG887	IPG889		
Sampling Date		2018/12/07	2018/12/07	2018/12/07		
COC Number		B 136112	B 136112	B 136112		
	UNITS	PS-01 - TAN PAINT WALLS - CLOSET OFF 132	PS-01 - TAN PAINT WALLS - CLOSET OFF 132 Lab-Dup	PS-03 - MED TAN PAINT WALL - ROOM 126	RDL	QC Batch
Metals						
Acid Extractable Arsenic (As)	mg/kg	<10	<10	<10	10	5902812
Acid Extractable Lead (Pb)	mg/kg	<5.0	<5.0	<5.0	5.0	5902812
Acid Extractable Mercury (Hg)	mg/kg	<1.0	<1.0	<1.0	1.0	5902812
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Lab-Dup = Laboratory Initiated Duplicate						

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		IPG888	IPG890	IPG890		
Sampling Date		2018/12/07	2018/12/07	2018/12/07		
COC Number		B 136112	B 136112	B 136112		
	UNITS	PS-02 - WHITE PAINT CEILING - STAFF WASH RM	PS-04 - CREAM PAINT WALL - ROOM 120	PS-04 - CREAM PAINT WALL - ROOM 120 Lab-Dup	RDL	QC Batch
Metals						
Acid Extractable Arsenic (As)	mg/kg	<10	<10	<10	10	5902813
Acid Extractable Lead (Pb)	mg/kg	49	<5.0	<5.0	5.0	5902813
Acid Extractable Mercury (Hg)	mg/kg	<1.0	<1.0	<1.0	1.0	5902813
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Lab-Dup = Laboratory Initiated Duplicate						

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	13.3°C
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Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5902812	BAN	Matrix Spike [IPG887-01]	Acid Extractable Arsenic (As)	2018/12/22		94	%	75 - 125
			Acid Extractable Lead (Pb)	2018/12/22		102	%	75 - 125
			Acid Extractable Mercury (Hg)	2018/12/22		105	%	75 - 125
5902812	BAN	Spiked Blank	Acid Extractable Arsenic (As)	2018/12/22		100	%	75 - 125
			Acid Extractable Lead (Pb)	2018/12/22		98	%	75 - 125
			Acid Extractable Mercury (Hg)	2018/12/22		103	%	75 - 125
5902812	BAN	Method Blank	Acid Extractable Arsenic (As)	2018/12/22	<10		mg/kg	
			Acid Extractable Lead (Pb)	2018/12/22	<5.0		mg/kg	
			Acid Extractable Mercury (Hg)	2018/12/22	<1.0		mg/kg	
5902812	BAN	RPD [IPG887-01]	Acid Extractable Arsenic (As)	2018/12/22	NC		%	35
			Acid Extractable Lead (Pb)	2018/12/22	NC		%	35
			Acid Extractable Mercury (Hg)	2018/12/22	NC		%	35
5902813	BAN	Matrix Spike [IPG890-01]	Acid Extractable Arsenic (As)	2018/12/22		76	%	75 - 125
			Acid Extractable Lead (Pb)	2018/12/22		82	%	75 - 125
			Acid Extractable Mercury (Hg)	2018/12/22		81	%	75 - 125
5902813	BAN	Spiked Blank	Acid Extractable Arsenic (As)	2018/12/22		100	%	75 - 125
			Acid Extractable Lead (Pb)	2018/12/22		98	%	75 - 125
			Acid Extractable Mercury (Hg)	2018/12/22		103	%	75 - 125
5902813	BAN	Method Blank	Acid Extractable Arsenic (As)	2018/12/22	<10		mg/kg	
			Acid Extractable Lead (Pb)	2018/12/22	<5.0		mg/kg	
			Acid Extractable Mercury (Hg)	2018/12/22	<1.0		mg/kg	
5902813	BAN	RPD [IPG890-01]	Acid Extractable Arsenic (As)	2018/12/22	NC		%	35
			Acid Extractable Lead (Pb)	2018/12/22	NC		%	35
			Acid Extractable Mercury (Hg)	2018/12/22	NC		%	35

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

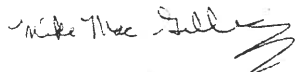
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Photographs

Photo Log – CCAHS Elmsdale, 224 Highway 214, Elmsdale, Nova Scotia



Photo 1: Subject building, Chignecto-Central Adult High School (CCAHS Elmsdale).



Photo 2: Photo of sample AS-08, Hallway (Main) – Piping Insulation, Fitting, 60% Chrysotile Asbestos.

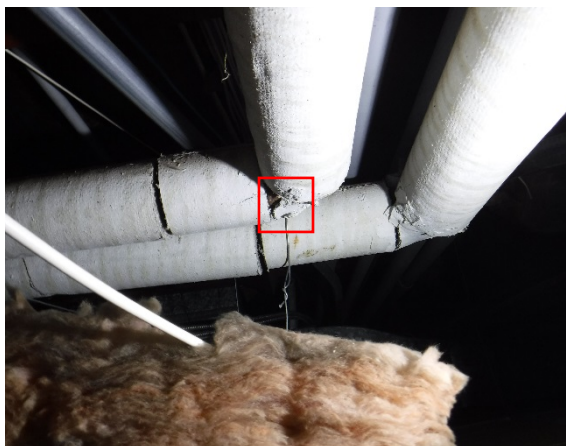


Photo 3: Photo of sample AS-09, Hallway (Main) – Piping Insulation, Fitting, 65% Chrysotile Asbestos.



Photo 4: Photo of sample AS-11, Hallway (Main) – Piping Insulation, Straight Run, 60% Chrysotile Asbestos.

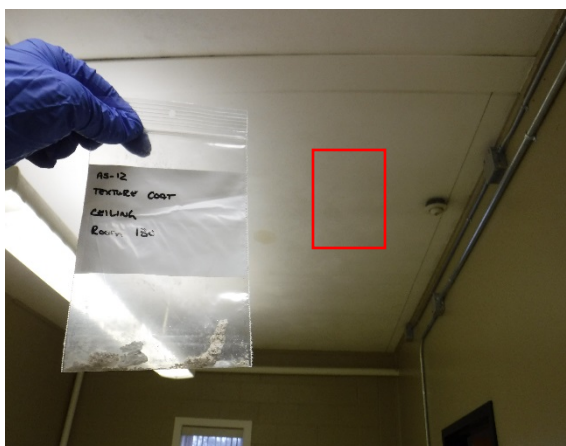


Photo 5: Photo of sample AS-12, Room 130, Ceiling – Texture Coating, 2% Chrysotile Asbestos.



Photo 6: Photo of sample AS-13, Room 130, Floor – Tan Color Vinyl Sheet Flooring, 10.3% Chrysotile Asbestos.

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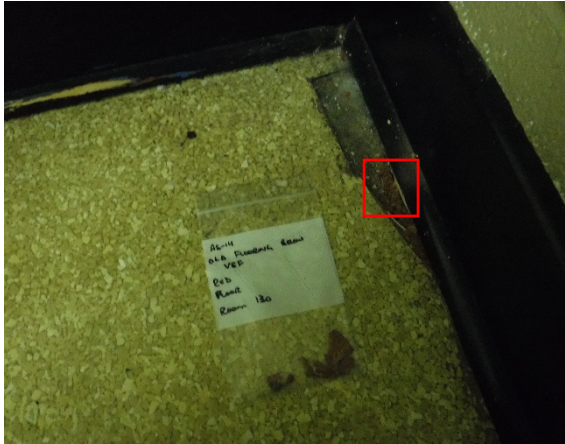


Photo 7: Photo of sample AS-14, Room 130, Floor – Flooring Material below VSF, 6.4% Chrysotile Asbestos.



Photo 8: Photo of sample AS-15, Room 127, Ceiling – Texture Coating, 1% Chrysotile Asbestos.



Photo 9: Photo of sample AS-19, Men's Washroom, Window – Caulking Material, 2% Chrysotile Asbestos.

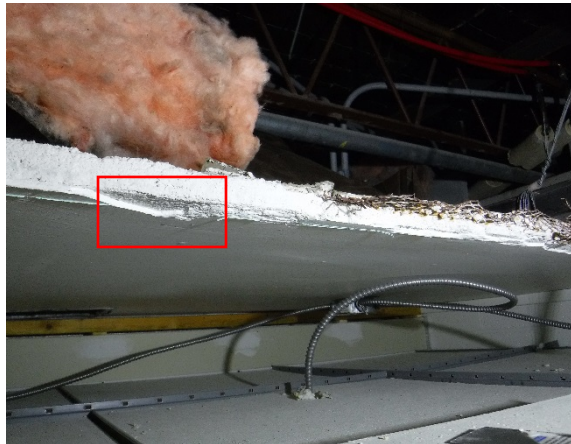


Photo 20: Photo of sample AS-20, Staff Washroom, Ceiling – Texture Coating, 2% Chrysotile Asbestos.

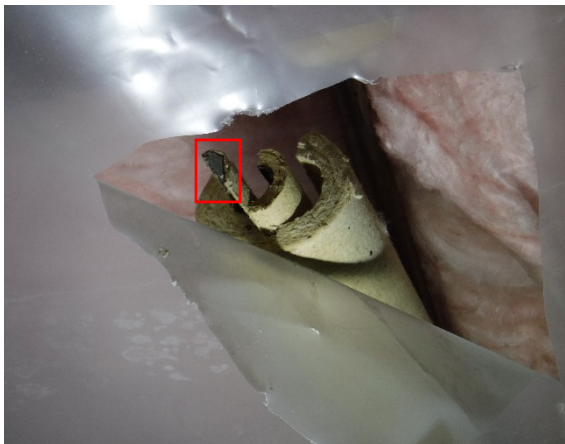


Photo 31: Photo of sample AS-24, Room 118, Ceiling – Piping Insulation, Tar Paper on Straight Run, 8% Chrysotile Asbestos.



Photo 42: Photo of sample AS-26, Room 110 – Piping Insulation, Fitting, 55% Chrysotile Asbestos.

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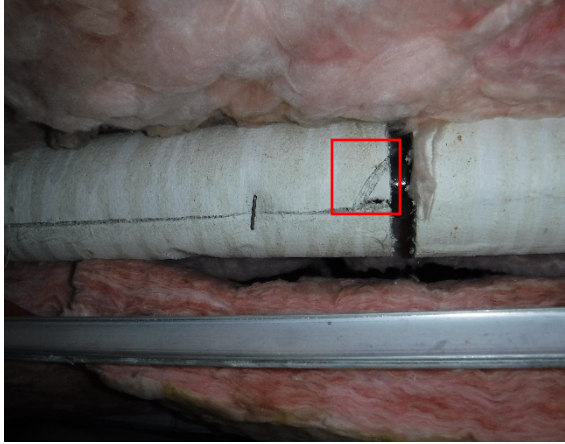


Photo 53: Photo of sample AS-27, Room 110 – Piping Insulation, Straight Run Air-Cell, 65% Chrysotile Asbestos.

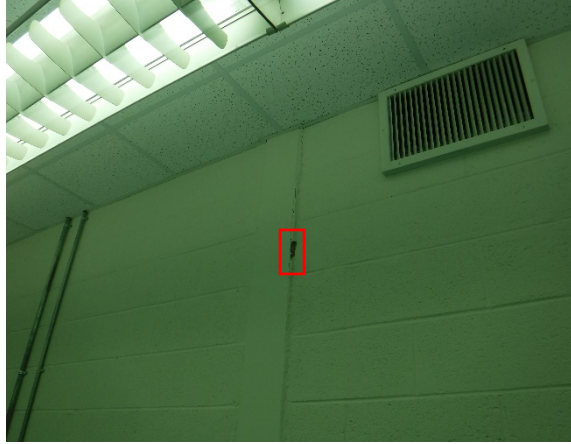


Photo 64: Photo of sample AS-28, Room 110, Wall – Expansion Joint Compound, White/Grey, 0.27% - 1.9% Chrysotile Asbestos.



Photo 75: Photo of sample AS-34, Room 105, Bathroom – Lighting Unit Heat Shield, 45% Chrysotile Asbestos.



Photo 86: Photo of sample EXT-AS-01, Building Exterior – Transite Panel, 13.6% Chrysotile Asbestos.



Photo 97: Photo of sample EXT-AS-02, Building Exterior – Caulking around Transite Panel, 2.2% Chrysotile Asbestos.



Photo 108: Photo of sample EXT-AS-03, Building Exterior, Wall – Expansion Joint Compound, Black/White, 0.76% - 1.2% Chrysotile Asbestos.

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Photo 119: Photo of sample EXT-AS-06, Building Exterior, Wall – Caulking Around Door, 1.2% Chrysotile Asbestos.



Photo 20: Photo of transite panel found in Hallway (SW), Ceiling Cavity – Visually similar to EXT-AS-01, 13.6% Chrysotile Asbestos.



Photo 21: Example Photo of Poor Condition, Unwrapped ACM Piping Insulation, Fitting – Hallway (Main), Ceiling Cavity.



Photo 22: Example Photo of Poor Condition, Unwrapped ACM Piping Insulation, Fitting – Hallway (Main), Ceiling Cavity.



Photo 23: Example Photo of Poor Condition, Damaged ACM Piping Insulation, Straight Run – Room 118, Ceiling Cavity.

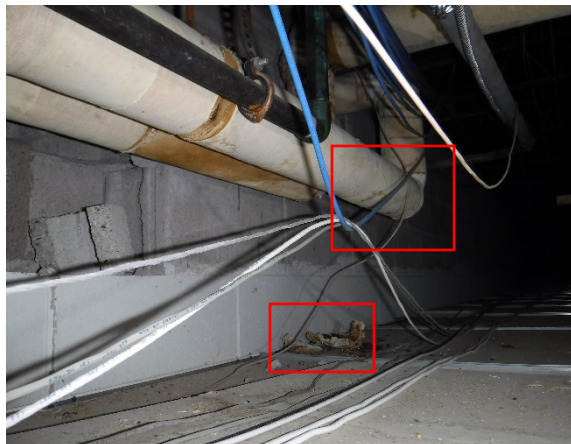


Photo 24: Example Photo of Poor Condition, Damaged ACM Piping Insulation with Debris on Ceiling Tile, Fitting – Hallway (SW), Ceiling Cavity.

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Photo 25: Example Photo of Poor Condition, Damaged ACM Piping Insulation, Fitting – Hallway (SW), Ceiling Cavity.



Photo 26: Example Photo of Poor Condition, ACM Piping Insulation damaged from Actively Leaking Pipe, Straight Run – Hallway (SW), Ceiling Cavity.



Photo 27: Example Photo of Poor Condition, Unwrapped ACM Piping Insulation, Fitting – Room 106, Ceiling Cavity.



Photo 28: Example Photo of Poor Condition, Unwrapped ACM Piping Insulation, Fitting – Room 106, Ceiling Cavity.

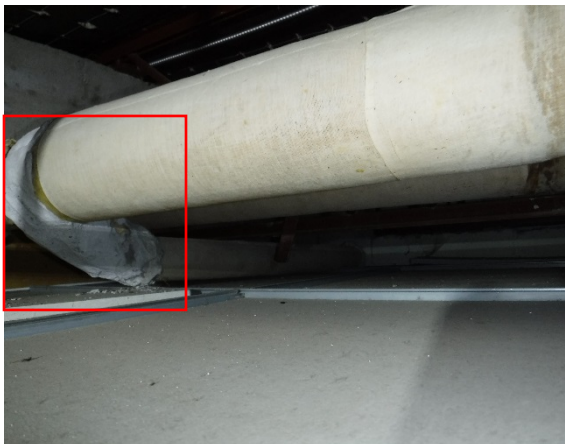


Photo 29: Example Photo of Poor Condition, Unwrapped ACM Piping Insulation, Fitting – Room 104, Ceiling Cavity.



Photo 30: Example Photo of Poor Condition, Unwrapped ACM Piping Insulation, Fitting – Room 104, Ceiling Cavity.

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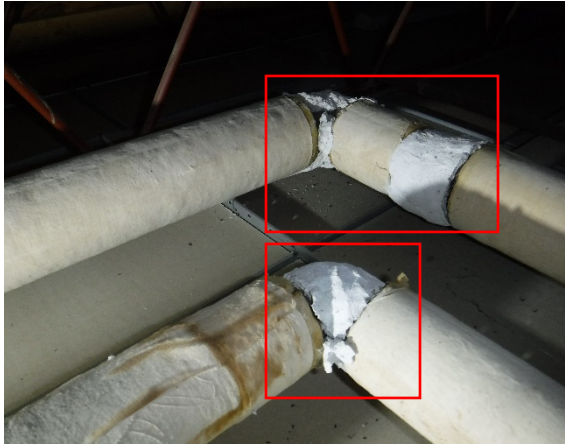


Photo 31: Example Photo of Poor Condition, Unwrapped ACM Piping Insulation, Fitting – Room 100, Ceiling Cavity.



Photo 32: Example Photo of Remaining ACM Piping Insulation – Mechanical Room.



Photo 33: Example Photo of Remaining ACM Piping Insulation – Mechanical Room.



Photo 34: Example Photo of Remaining ACM Piping Insulation – Mechanical Room.

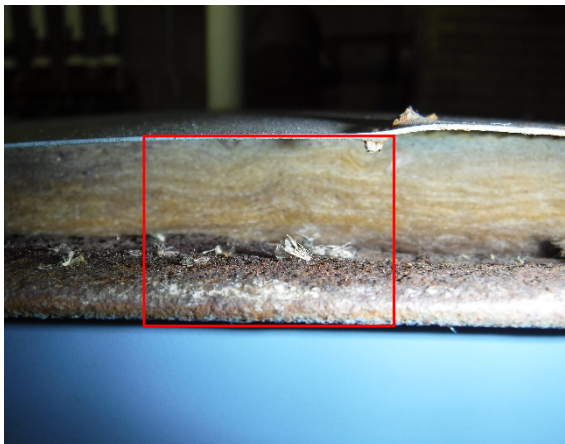


Photo 35: Example Photo of Non-Hazardous Fiberglass Insulation in Boilers – Mechanical Room.



Photo 36: Example Photo of Non-Hazardous Fiberglass Insulation in Boilers – Mechanical Room.

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Photo 37: Example Photo of Wall Profile Investigation – Room 106, Ceiling Cavity.



Photo 38: Example Photo of Wall Profile Investigation – Room 106, Ceiling Cavity.



Photo 39: Example Photo of Wall Profile Investigation – Room 106, Ceiling Cavity.



Photo 40: Example Photo of Wall Profile Investigation – Room 106, Ceiling Cavity.



Photo 41: Example Photo of Wall Profile Investigation – Room 106, Ceiling Cavity.



Photo 42: Example Photo of Wall Profile Investigation – Room 100, Ceiling Cavity.

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Photo 43: Example Photo of Inspected Lighting Ballasts – Hallway (Main), “Non-PCB”.



Photo 44: Example Photo of Inspected Lighting Ballasts – Men’s Washroom (SW), “Non-PCB”.



Photo 45: Example Photo of Mercury Thermostats observed throughout building.



Photo 46: Example Photo of Mercury vial in older style thermostats observed throughout building.

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