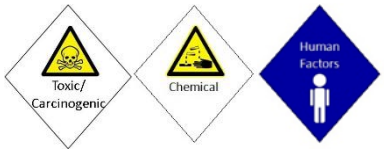

1.0 Introduction

Asbestos is a generic name given to several naturally occurring hydrated mineral silicates. Asbestos is a naturally occurring mineral. The most used types of asbestos are named chrysotile, amosite, and crocidolite. Asbestos has been and continues to be used in a variety of materials due to its strength and unique fire and chemical resistance properties.

The use of asbestos-containing spray products was widespread until approximately 1972. When working on buildings or pipelines built before this date, follow up with the site owner regarding site testing records or site labeling conventions for asbestos-containing material. If there are no testing records and there is the potential for asbestos, testing or abatement must be completed before work commences.

When working in areas where asbestos-containing materials may be disturbed or where asbestos abatement projects are underway, the following precautions must be adhered to:

- Do not disturb any materials that you may believe contain asbestos.
- Do not enter the immediate area where abatement activities are taking place.
- Observe and obey all warning signs set out by the abatement contractor.

Asbestos must be inhaled to cause disease. Intact and undisturbed asbestos presents no direct health hazard but does present a potential exposure hazard should fibres be released and inhaled.

Asbestos-related lung diseases are caused by asbestos fibres that are inhaled and settle in the lungs. Conditions associated with asbestos include:

Asbestosis: The lungs build up scar tissue because the body recognizes asbestos fibres as foreign, and this triggers an immune response. This causes lung tissues to stiffen and leads to symptoms of coughing and breathing difficulty.

Lung Cancer: Inhalation of asbestos fibres has been linked to an increased risk of lung cancer in many studies of asbestos-exposed workers.

Malignant Mesothelioma: A rare type of cancer. Exposure to asbestos increases the risk of mesothelioma of the pleura, the membranes that line the lungs, and of the peritoneum, a membrane which lines the abdomen.

1.1 Purpose

Strike does not perform moderate/high-risk asbestos abatement, but workers may perform limited low-risk work involving non-friable Asbestos-Containing Material (ACM), such as pipeline coatings or gaskets. Work activities that involve demolition, disturbance, and/or removal of asbestos-containing materials will be contracted to a company with expertise in asbestos abatement. Information related to high/medium risk within this document, such as decontamination units, containment systems, and final clearance air testing, is included for awareness and contractor oversight only.

However, Strike's work does occasionally require the removal of pipeline coating or gaskets, which may contain asbestos. Exposure to asbestos-containing coating must be kept as low as reasonably practicable. All removal of pipeline coating which contains (or may contain) asbestos is to be completed in accordance with SJP-42 Removal of Pipeline Coating Potentially Containing Asbestos.

Workers affected by this code of practice should be familiar with it before any work begins. This COP applies to all Strike workers, contractors, and job site visitors.

1.2 Physical Properties

Asbestos is found naturally in veins in the host rock and is produced in a commercially useful form by open-pit mining. The main properties that make asbestos useful are its incombustibility, strength, and flexibility when separated into fibres. It is also effective as a reinforcing or binding agent when combined with cement or plastic. The construction industry was historically the main user of asbestos products.

1.3 Friability

The more easily the material can crumble, the more friable the material and the greater the potential for asbestos fibre release and contamination. Sprayed asbestos material is generally more friable than most troweled materials or mechanically installed.

Friable material can be crumbled, pulverized, or powdered by hand pressure. If a friable asbestos-containing material is damaged or disturbed, it presents an inhalation risk because asbestos fibres are more easily released into the air. Examples of friable materials include sprayed fireproofing on structural steelwork or thermal insulation on pipes.

Non-friable asbestos product is one in which the asbestos fibres are bound or locked into the product matrix, so that the fibres are not readily released. Such a product would present a risk for fibre release only when it is subject to significant abrasion through activities such as sanding or cutting with electric power tools. Examples of non-friable asbestos products include vinyl asbestos floor tiles, acoustic ceiling tiles, and asbestos cement products. Where asbestos is used in pipeline coating, it is generally considered non-friable, unless the coating has degraded due to age.

2.0 Responsibilities

2.1 Management

Management is to support the health and safety of its workers at all stages of work. The Manager is responsible to:

- Develop policies and procedures to ensure workers are not exposed to asbestos above the occupational exposure level (OEL).
- Oversee the implementation of this COP to ensure it is effective.
- Not assign tasks to a worker for which they are not competent.
- Provide the necessary equipment and PPE.
- Engage with the client/owner at the pre-job planning stage to identify and assess if and where asbestos hazards are expected to be encountered, and their concentrations.
- Ensure that this code of practice is utilized and adhered to by supervisors and workers.
- Maintain detailed records of all testing, clean-up, and medical follow-up testing.

2.3 Supervisor

Strike Supervisors are responsible to:

- Minimize the release of asbestos into the air, keeping work exposure as low as reasonably achievable/practicable, and never exceeding the OEL.
- Keep the work site clear of unnecessary accumulations of asbestos waste and materials containing asbestos.
- Ensure decontamination of workers and materials does not result in the release of airborne fibres.
- Ensure containers used to dispose of asbestos are sealed and impervious to asbestos.
- Ensure that asbestos waste is labeled as “Carcinogenic – Do not inhale dust”.
- Provide a means to prevent workers’ street clothes from being contaminated with asbestos fibres or other workplace contaminants.
- Ensure that this Code of Practice is utilized and adhered to by supervisors and workers.

2.4 Worker

All Strike workers must:

- Stop task work if the risk of exposure to asbestos is suspected.
- Inspect any required PPE before use.
- Participate in any assigned training and raise any questions or concerns that may arise.

3.0 Hazard Identification, Assessment, and Control (HIAC)

3.1 Common Locations of Asbestos

Building and facility owners are responsible for determining the presence, location, and quantity of Asbestos-Containing Material (ACM) and/or Previously Asbestos-Containing Material (PACM) at the work site. Building and facility owners are required to maintain records for the duration of ownership and shall be transferred to successive owners.

In buildings and facilities constructed prior to 1972, spray asbestos was common in the following locations. Prior to starting work, confirm with the owner whether asbestos-containing materials are present.

Note: Asbestos-containing materials continued to be used in many products for years after 1972, always verify with the site owner if asbestos is present.

Building Exteriors	Flooring & Ceilings	Walls	Pipes
• Asbestos cement siding panels • Asbestos cement soffits • Stucco • Asbestos cement roof panels – corrugated • Brick and block mortar • Roofing felts and mastics • Loose fill insulation in exterior wall cavities (vermiculite)	• Vinyl asbestos tiles • Floor leveling compound • Sheet vinyl flooring (asbestos paper backing) • T-bar ceiling tile • Acoustic and stippled finishes • Asbestos cement ceiling tile	• Plaster or drywall jointing materials • Thermal spray • Stippled finishes • Asbestos cement panels • Pipe and duct chases, pipes, duct	• Steam and hot water heating supply and return lines • Rainwater and sanitary lines – asbestos cement or bell and spigot cast iron • Domestic water supply and drain lines • Insulated or bare pipe • Chilled water lines • Gaskets in flanged pipe joints • Pipeline coatings

3.2 Monitoring for Asbestos Exposure

Air monitoring is important in evaluating how well workers are being protected, the selection of respiratory protective equipment, the effectiveness of decontamination, and the integrity of the containment during abatement activities. Collection of reliable data requires a thorough knowledge of air sampling, analytical techniques, and when a particular technique should be used. Air monitoring must only be performed by competent personnel such as a qualified occupational hygienist, competent consultant, or trained asbestos assessor depending on jurisdiction.

During asbestos abatement activities, monitoring will be conducted to ensure that no employee is exposed to an airborne concentration of asbestos exceeding 0.1 fibres per cubic centimetre of air as an 8-hour time-weighted average (TWA).

Air sampling and sample analysis must be conducted according to the most current edition of the NIOSH Manual of Analytical Methods (NMAM).

Two types of sampling can be used to determine airborne fibre concentrations:

3.3 Personal/breathing zone/occupational sampling

Personal, breathing zone or occupational samples are collected using a portable battery-powered pump worn by the worker during specific abatement activities. The sampling cassette is positioned facing downward in the worker's "breathing zone" (as close to the mouth as possible), and the pump is attached to a belt worn around the worker's waist. Typically, phase contrast microscopy is used to analyze the samples. Personal sampling should be done during a repair, renovation or abatement project to determine the worker's exposure to asbestos fibres. Representative samples should be taken to confirm proper selection of respiratory protective equipment and the effectiveness of removal or control techniques in reducing worker exposure to airborne asbestos fibres.

3.4 Area Sampling should be used in the following situations during abatement projects:

a. *Before abatement activities begin* — air monitoring conducted prior to abatement work commencing is called "background sampling". Background samples provide valuable information for documentation purposes. Generally, one background sample should be taken for each 450 m^2 of space (3000 to 10,000 litres of air volume in the workspace).

b. *Area air samples outside the work area but inside the building* — samples are collected throughout the duration of the asbestos abatement project to determine how well asbestos fibres are being contained in the work area. These samples are very important when abatement activities are performed in an occupied building. Samples should be collected from:

   I. the clean room;
   II. the clean side of the containment barrier;
   III. in multi-story buildings, one floor above and one floor below (if these areas are occupied) and the floor on which abatement activities are occurring; and
   IV. at any other locations representative of those that could be contaminated due to fibre migration should there be a loss of containment.

c. Area sampling outside the building — area sampling can be conducted outside the building during abatement activities to determine if any asbestos fibres are leaking from the work area. Suggested sampling locations include windows, doors, the exhaust from negative air units, waste load-out areas and areas downwind of abatement activities.

d. Area air sampling after final clean-up of the work area — after a thorough final visual inspection has been completed and the clean-up is considered acceptable, the abatement contractor encapsulates all surfaces inside the containment with a glue spray. The spray is allowed to settle and dry for a minimum of 4 hours (ideally 8 to 12 hours) and then final air tests can be conducted. Negative air units should remain running until the final air test is completed and analyzed as acceptable unless dust from construction or other activities would be drawn into the containment. Care must be taken to collect a sufficient volume of air to achieve quantifiable loadings on the filter.

4.0 Worker Training

All workers who work with asbestos will receive training necessary for them to perform their work safely. Workers who may enter a "restricted area" must successfully complete an asbestos abatement course of at least two days duration. Only competent workers will be allowed to conduct asbestos abatement activities. The supervisor will determine worker competence. Supervisors will use both formal training and on-the-job training to assess competence.

Workers must have their valid certification cards available at the work site when they are working. Occupational Health and Safety Officers may ask a worker to produce their original card plus appropriate identification.

In Alberta, Strike workers involved in low-risk abatement projects (removal non-friable pipe coating with hand tools) are not required to complete a two-day asbestos abatement course and need not possess an Asbestos Worker Card. Workers will complete the Asbestos Awareness Training that is appropriate to the level of worker involvement in the project. The training will, at a minimum, contain the following elements:

a. health hazards associated with exposure to asbestos;
b. responsibility of workers, employers, contractors and suppliers under the OHS Act;
c. asbestos requirements in Part 4 of the OHS Code;
d. safe work procedures related to the work, must meet sections 5.2 and 5.3 of the Alberta Asbestos Manual, as appropriate;
e. how to properly wear, use, and maintain personal protective equipment that will be used at the work site.

This training may be provided by a training agency or in-house by persons who are knowledgeable in the procedures and hazards associated with asbestos abatement.

Note: This applies to Alberta regulated sites only; check jurisdiction, site owner, or client requirements.

Jurisdiction	Asbestos Training Requirements
Federal	Meeting the training requirements detailed in Technical guideline to asbestos exposure management programs
BC	Asbestos Training, Certification & Licensing
AB	Asbestos Worker Training
SK	Meeting the competencies outlined in Saskatchewan Asbestos Abatement Manual
MB	Meet the training requirements detailed in Guide for Asbestos Management

5.0 Decontamination

For high-risk removal jobs, the only satisfactory method of providing an appropriate decontamination facility is with a mobile or specially constructed on-site unit. The decontamination facility is located immediately adjacent to, and joined to, the enclosed asbestos removal area. The facility is divided into three distinct rooms: Dirty Room, Shower Room, and Clean Room.

The decontamination facility's three rooms are separated from one another by means of a suitable airlock or buffer zone. This airlock defines the boundary between each segment of the decontamination facility. The airlock allows personnel to access the removal area and restricts the flow of air between areas. Partitions between rooms in the decontamination facility must be self-closing so that each room functions as an airlock. These partitions are normally constructed of overlapping sheets of heavy-weight plastic suspended to form a curtain.

Generally, no more than 10 persons should use one decontamination facility so that adequate access to shower and cleaning facilities is provided and line ups are avoided.

The Dirty Room should have provision for:

a. hosing down contaminated clothing and footwear or cleaning it with a vacuum cleaner fitted with a HEPA filter;
b. storage of contaminated clothing and footwear;
c. bins for waste materials; and
d. airflow towards the removal area.

The Shower Room should have provision for:

a. a shower area with an adequate supply of soap, shampoo and hot and cold water;
b. airflow towards the dirty decontamination area.

The Clean Room should have provision for:

a. storage of individual respirators in containers or lockers;
b. a mirror to assist in donning respiratory protective equipment;
c. storage of clean clothing;
d. separate storage of clean and dirty towels; and
e. airflow towards the shower and dirty area.

All water from the decontamination facility should pass through a 10 micrometre filter before it passes into the sewer mains.

6.0 Waste Handling

Waste material from within the enclosed asbestos work area must be placed in impervious containers (doubled polyethylene bags at least 6 mm thick are acceptable), sealed and clearly labeled to indicate that:

a. they contain asbestos;
b. asbestos is carcinogenic; and
c. asbestos fibres should not be inhaled.

If the waste materials are likely to puncture the polyethylene bags, suitable rigid containers must be used.

Clean the external surfaces of sealed containers of asbestos waste by wiping with a damp cloth that is also to be disposed of as asbestos waste, or by using a vacuum cleaner fitted with a HEPA filter, before the containers leave the contaminant area/transfer room.

In the equipment transfer room, sealed containers must be packaged to withstand handling and transportation to the disposal site without being punctured or otherwise damaged.

A continuous clean-up and disposal program must be in place to prevent unnecessary accumulation of asbestos-containing waste materials at the work site.

At the end of each work shift, all asbestos waste material must be properly contained. Prior arrangement must be made with appropriate authorities to deliver asbestos-containing waste to assigned dump sites. Transport drivers must be informed of the precautions that must be taken. Transport vehicles may be required to carry signs or placards specifying the nature of the cargo (see Section 3 and the *Transportation of Dangerous Goods Act*).

Disposal sites must conform to provincial and municipal requirements (refer to Section 3 on legislation and contact the Waste Management Branch of Alberta Environment for more information).

7.0 Protective Clothing

Protective clothing for asbestos abatement work usually consists of disposable, impermeable coveralls, foot coverings, gloves and head coverings. Protective clothing reduces contamination of the worker's body and hair and makes decontamination when leaving the work area much easier.

Protective clothing with an attached hood and foot coverings provides the most complete protection. Alternatively, rubber boots can be worn as long as they are properly decontaminated prior to removal from the work site. Disposable types of protective clothing are made of products such as Tyvek™. Permeable outer clothing is not recommended for asbestos abatement work as fibres can penetrate the clothing, contaminating clothing worn beneath it and contaminating the skin.

Reusable clothing and towels must be collected at the work site and sent to a laundry that specializes in cleaning clothing contaminated with asbestos.

Appropriate footwear must also be worn to provide protection from sharp or heavy objects and wet or slippery conditions. Other safety equipment such as head, eye and hearing protection should be worn if hazardous conditions requiring their use are encountered.

8.0 Respiratory Protective Equipment

Air-purifying respirators to be used if the environment in the work area is not immediately dangerous to life or health and the oxygen content is 19.5 per cent or more and will continue to be, provided the equipment is designed to protect against the specific airborne contaminants present.

A NIOSH-approved half-mask air-purifying respirator equipped with a P100 (oil-proof), R100 (oil-resistant), or N100 (not oil-resistant) filter. Disposable single-use respirators must not be used.

Where air-purifying respirators are used, the airborne contaminant level must not exceed the product of the protection factor assigned to the respirator multiplied by the OEL for asbestos.

9.0 Health Assessment Records

If a worker is designated as an exposed worker under applicable legislation, the worker must undergo a health assessment within 30 days of being designated an exposed worker, and every two years thereafter. The worker may refuse the test by submitting a written refusal to the employer.

At the time the worker becomes an exposed worker, the employer will ensure that the health assessment is done. The assessment will be conducted by a qualified physician and consist of a chest x-ray, including radiologist's report, a pulmonary function test and worker's work history.

The cost of medical testing and the time taken to undergo the tests will be borne by the employer.

Test records will be kept confidential unless the worker has given written permission for access by another person or the records do not identify the worker. Only the worker or health professional who conducts the health assessment will have access to the exposed worker's health assessment.

10.0 Notification of project start-up – Alberta

Notification must be given to Alberta Occupational Health and Safety at least 72 hours before beginning activities that may release asbestos fibres. This includes set-up operations that may release fibres, for example, the removal of barriers or partitions such as false ceilings behind or on which asbestos-containing materials may have accumulated. The 72-hour period starts once the work site party receives acknowledgement of receipt of the notice of project.

Note: These requirements are current at the time of release of this document; verify the current requirements at the start of the project.

This notification must include the location of the work site, the start and completion dates, and a description of the work to be performed. The notification can be submitted online at www.alberta.ca/submit-asbestos-project-notification.aspx. Once the notification is submitted, receipt of the notification will be acknowledged via email. Notification is required for all high-, moderate-, and low-risk projects, except as noted below.

Sampling of asbestos-containing materials or potential asbestos-containing materials as part of an asbestos assessment project – sampling must be performed by competent personnel in a manner that minimizes disturbance and damage to the asbestos-containing materials.

- Removal and replacement of one small (less than 30-centimetre diameter) manufactured asbestos product such as a gasket or valve packing.
- Short-term work in areas containing non-friable asbestos-containing materials that does not involve disturbing the asbestos-containing materials.

REFERENCES / ADDITIONAL INFORMATION

- Client/Owner must provide list of products and/or fugitive emissions on site and in particular, in and/or around the Confined Space area.
- Government of Canada Technical guideline to asbestos exposure management programs.
- Alberta Asbestos Abatement Manual.
- British Columbia Managing waste asbestos.
- Saskatchewan Understanding, Identifying and Handling Asbestos.
- Manitoba FAQs: Asbestos-Containing Material.

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