



# **Exposure Control Plan (Asbestos Cement Pipe)**

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## 1 PURPOSE

This exposure control plan (ECP) establishes City of Surrey's (City's) approach to minimizing asbestos exposure risks of City workers and the exposure risks of others while working on asbestos containing cement pipes.

## 2 RESPONSIBILITIES

Due to the significant risk posed by asbestos-containing materials (ACMs), all personnel involved in operations that could potentially be exposed to asbestos are to take specific action to ensure that a hazard is not created. The following departments, divisions and sections may encounter asbestos cement (AC) pipe:

<b>Department</b>	<b>Division/Section</b>
Engineering	Operations Construction & Sanitary Sewer Manager Pumps and Control Manager Solid Waste Manager Water Operations Manager
Parks, Recreation and Culture	Parks Landscape Operations & Park Partnerships Urban Forestry & Environmental Programs Park Development Services Park Facility Operations Landscape Operations & Park Partnerships

### 2.1 Administrator

The administrator of our asbestos cement (AC) pipe exposure control plan, Scott McMillan, is responsible for:

- Administering the overall program, including the maintenance of records
- Reviewing the program on an annual basis with input from the joint health and safety committee, other managers, workers, and whenever necessary with consultants.

Scott McMillan, CRSP, BSc is an Occupational Health and Safety Specialist who is registered with the Canadian Registered Safety Professionals and has sufficient training and experience to fulfill his responsibilities.

## **2.2 Employer (City of Surrey)**

The City of Surrey is responsible for the following:

- Ensuring that the materials (e.g. tools, equipment, PPE) and other resources (i.e. worker training materials) required to fully implement and maintain this exposure control plan (ECP) are readily available where and when they are required.
- Conducting a periodic review of the effectiveness of the ECP. This would include a review of the available abatement technologies to ensure these are selected and used when practical.
- Ensuring that all required tools, equipment, and PPE are readily available and used as required by the ECP
- Ensuring managers and workers are educated and trained to an acceptable level of competency.
- Providing adequate instruction to workers on the hazards of working with asbestos-containing materials and on the precautions specified in the job specific plan covering hazards at the location.
- Maintaining records of training, fit testing, crew talks, and inspections.
- Engineering Ops & OHS applies for a Standing Notice of Project Asbestos for AC pipe works with WorkSafeBC and if successful maintains the Standing Notice of Project Asbestos (SNOA) Log reports.
- Communicate asbestos risks to hired Prime/Contractors to ensure a safe work environment. Review and update the contract language for Operations, Capital and Land Development projects.

## **2.3 Section Manager**

The Section Managers are responsible for the following:

- Maintaining this ECP by reviewing it annually with the health and safety committee and keeping updated copies available in vehicles that crews use for and who are engaged in AC Pipe removal activities.
- Consult the Manager, Occupational Health and Safety on any changes to the ECP
- Selecting, implementing and documenting the appropriate site-specific control measures.
- Ensuring that the workers are using the proper respirators and have been fit tested and that the results are recorded.
- Directing the work in a manner that ensures the risk to workers is minimized and adequately controlled.
- Ensure that a “Notice of Project Asbestos” (NOPA) is sent to the Workers’ Compensation Board of British Columbia prior to performing any work activities involving asbestos containing materials. Detailed site specific work procedures must be submitted; OR

- **STANDING NOPA** - The following information must be supplied to Occupational Health & Safety (OHS) when logging work under the SNOPA:
  - 1) Date;
  - 2) Location;
  - 3) Department or crew responsible;
  - 4) Names of the supervisor, workers involved; and
  - 5) Confirming AC Pipe Cutting and Handling procedure will be or was (emergency work) followed.

## **2.4 Supervisor**

The Supervisors are responsible for the following:

- Providing adequate instruction to workers on the hazards associated with the cutting of asbestos-containing pipe.
- Selecting and implementing the appropriate control measures.
- Ensuring that workers using respirators have been properly fit-tested and that the results are recorded.
- Directing the work in a manner that ensures the risk to workers is minimized and adequately controlled.
- Liaising with other employers to ensure a safe work environment.
- Submitting an NOPA for all planned work 24 hours before starting a construction project and submitting an NOPA as soon as reasonable possible when responding to emergency work, unless a SNOPA is in place.

## **2.5 Worker**

The worker is responsible for the following:

- Using the assigned protective equipment in an effective and safe manner.
- Following established work procedures as directed by the manager.
- Reporting any unsafe conditions or acts to the project manager.
- Knowing how and when to report exposure incidents.

## **2.6 Qualified Person**

The Occupational Health and Safety Regulation defines a qualified person for the purposes of asbestos as a person who:

- Has knowledge of the management and control of asbestos hazards through education and training, and
- Has experience in the management and control of asbestos hazards.

When asbestos-containing materials may be present, a qualified person should be an occupational health and safety professional with occupational hygiene experience related to asbestos. These persons would include:

- Certified Industrial Hygienist (CIH), Registered Occupational Hygienist (ROH), Certified Safety Professional (CSP), Canadian Registered Safety Professional (CRSP), or Professional Engineer (P. Eng.), provided that the holders of these qualifications have experience in the recognition, evaluation, and control of lead hazards, or
- Persons with extensive occupational health and safety experience within the asbestos abatement industry and knowledge obtained through completion of recognized education and training courses in asbestos consultation and abatement such as the following:
  - "Building Inspection and Management Planning for Asbestos" course offered by the Continuing Education section of the University of California (Berkeley) Center for Occupational & Environmental Health, and conducting workplace inspections, or
  - AHERA Building Inspector course offered under the EPA Asbestos Hazard Emergency Response Act (AHERA).

The following activities may require of the qualified person:

- Risk assessments and work classifications (e.g., low, moderate or high risk)
- Preparation of asbestos work procedures

At the time of revising this ECP, Evan Alvernaz, CIH, ROH, CSP of Arcose Consulting Ltd. (Arcose) was retained by the City of Surrey as a qualified person to conduct risk assessments on AC pipe removal and preparing safe work procedures. Other qualified persons may be involved in future work.

### **3 RISK IDENTIFICATION AND ASSESSMENT**

#### **3.1 What is Asbestos?**

Asbestos is a group of naturally occurring minerals used in many products to add strength, heat-resistance, and chemical resistance. Despite its many uses, asbestos is a hazardous material. If employers and workers do not take proper precautions when working around asbestos, workers may develop serious chronic health problems or even die of an asbestos-related disease.

Some common materials that contain asbestos include:

- Pipe/mechanical insulation
- Sprayed fireproofing/thermal insulation
- Textured finishes
- Acoustical ceiling tiles
- Loose fill vermiculite
- Plaster
- Vinyl sheet flooring
- Drywall mud
- Cement pipes
- Caulking and mastics
- Roofing material

The presence of any asbestos in a material will result in the need for a qualified person – as identified by this ECP – to complete a risk assessment and develop appropriate work procedures to minimize the risk.

The British Columbia Occupational Health and Safety Regulation defines asbestos-containing material as containing 0.5% or more asbestos as determined by polarized light microscopy, electron microscopy, and/or gravimetric analysis. An exception is made for vermiculite-containing insulation materials (e.g., more than 25% vermiculite), which are considered asbestos-containing if *any* asbestos (even less than 0.5%) is present.

The Occupational Health and Safety Regulation also establishes occupational exposure limits (OELs) for all forms of asbestos. The 8-hour occupational exposure limit (EL) for asbestos (all forms) is 0.1 fibres per millilitre (fibres/cc).

#### **3.2 Health Hazards**

Asbestos is a hazardous material. Its fibres are extremely fine and can remain suspended in the air for hours. Workers exposed to asbestos contaminated air can inhale the fibres. If handled improperly asbestos may cause serious chronic health problems and even death.

Asbestos related disease does not typically affect individuals in the short term. Often, there is a long latency period of 10 to 20 years, or more, before asbestos related disease develops. But once diagnosed, it is often too late for corrective treatment. There is a need for workers to protect themselves now.

Asbestosis is a chronic lung disease resulting from prolonged exposure to asbestos dust. The fibres gradually cause the lung to become scarred and stiff, making breathing difficult.

Lung cancer may be caused by asbestos fibres in the lung. No one knows exactly how asbestos causes lung cancer. Researchers have shown, however, that the combination of smoking tobacco and inhaling asbestos fibres greatly increases the risk of lung cancer.

Mesothelioma is a cancer which affects the lining of the lungs (pleura) and the lining surrounding the lower digestive tract (peritoneum). It is almost exclusively related to asbestos exposure and by the time it is diagnosed, it is almost always fatal.

Pleural thickening is generally a problem that happens after heavy asbestos exposure. The lining of the lung (pleura) thickens and swells. If this gets worse, the lung itself can be squeezed, and can cause shortness of breath and discomfort in the chest.

Initially, workers exposed to asbestos may have no symptoms; however, as the disease progresses, a worker may experience:

- Shortness of breath
- Severe cough
- Weakness

### 3.3 Additional Hazards

Due to the locations of the AC pipe on City’s property, workers may be exposed to other hazards in the surrounding setting. Below is list of potential hazards that workers may encounter during the removal of AC pipe.

• Buried utilities	• Slip/trip hazards	• Noise	• Traffic
• Overhead hazards	• Eye hazards	• Heat stress	• Biohazards
• Mobile equipment	• Shoring/excavation		



## **4 RISK ASSESSMENT**

Generally, the work activities completed by City of Surrey workers will be limited to Low Risk and Moderate Risk asbestos work activities.

### **4.1 Low Risk Activities**

Low risk activities are those that involve working with or in proximity to asbestos-containing material if the material is not being cut, sanded, drilled, broke, ground down, or otherwise fragmented. Low risk activities include asbestos work that is NOT being disturbed such that asbestos fibres may be released.

The following risk activity is deemed to be a low risk activity:

- Moving asbestos-containing waste material that is contained within a cleaned labelled bag and double wrapped in 6 mil polyethylene.

It would not be necessary to use PPE or engineering controls to prevent worker exposure to airborne asbestos fibres.

### **4.2 Moderate Risk Activities**

Moderate risk activities are those other than high-risk work activities that involve working with or in proximity to asbestos-containing material that is being cut, sanded, drilled, broken, ground down, fragmented, or otherwise disturbed. It is necessary to use PPE or engineering controls to prevent worker exposure to airborne asbestos fibres.

The following risk activities are deemed to be a moderate risk activity:

- Removal of all asbestos containing Chrysotile/Crocidolite Cement Pipe.

Moderate-risk work activities require specific procedures to ensure the safety of workers and others who may be affected by the activities.

### **4.3 High Risk Activities**

High risk activities are those that involve working with or in proximity of asbestos-containing material if a high level of control is necessary to prevent worker exposure to airborne asbestos fibres. Currently, there are no activities identified as high risk within the City's departments specified in this ECP

All work activities not specifically identified must be assessed by a Qualified Person to determine the appropriate risk level prior to the work being completed.

The above risk assessment was completed by Evan Alvernaz, CIH, ROH from Arcose.

## **5 CONTROLS**

### **5.1 Elimination and Substitution**

Wherever possible, replacement of water mains or other AC Pipe related activities should be planned to avoid the need to tap into, cut, or remove AC Pipe from the ground. Off-line water main replacement is preferred over On-line replacement.

### **5.2 Engineering Controls**

#### **5.2.1 Barrier**

A barrier shall be established to isolate the work area from the rest of the project and to prevent entry by unauthorized workers. The abatement work area shall be delineated with asbestos hazard barrier tape or caution tape with asbestos warning signage at a minimum. The tape shall be placed 10 feet away (or as best as reasonably possible) from the edge of the excavation in preparation for the asbestos cement pipe repair or removal. Warning signs indicating the asbestos hazard shall be posted at all conceivable approaches to the work area.

#### **5.2.2 Contain Asbestos Waste**

Asbestos-containing materials will be contained, once removed, in 6 mil polyethylene bags labelled with Asbestos warning markings. The Asbestos Waste bag is then sealed in a goose neck fashion with duct tape and placed in a second Asbestos Waste bag which is again sealed in a goose neck fashion.

Where use of Asbestos Waste Bags is not applicable (i.e. length of AC Pipe to be removed is longer than 4 feet or too large for the bag to contain) Polyethylene drop sheets will be utilized. Two layers of Polyethylene drop sheets will be placed beneath the section of AC Pipe to be removed. Once removed, the AC Pipe will be placed directly onto the Polyethylene drop sheets. The first layer of the Polyethylene drop sheet will be used to contain the AC Pipe by wrapping around the pipe and tying the ends in a goose neck fashion and sealing with duct tape. The second layer of Polyethylene sheeting will be utilized to further contain the AC Pipe by double-wrapping the pipe and tying the ends in a goose neck fashion and sealing with duct tape. The double wrapped AC Pipe will then be labelled with an Asbestos Warning Sticker or marked appropriately with other means.

#### **5.2.3 Wetting**

Before disturbing any asbestos-containing materials, all surfaces of the material shall be sufficiently wetted with hoses, misting cans or misting bottles. The area which the AC Pipe is being disturbed (e.g. cut, drilled) must be kept wet throughout the procedure.

### **5.3 Administrative Controls**

Administrative controls means the provision, use and scheduling of work activities and resources in the workplace, including planning, organizing, staffing and coordinating, for the purpose of controlling risk

A number of administrative controls will be used, which will be identified by the various procedures which form part of this exposure control plan.

The procedures must be task specific and must address the control of the asbestos hazards. In addition, the following must be clearly identified:

- Any necessary barriers and containment;
- Use of personal protective equipment and clothing;
- Decontamination procedures; and,
- Asbestos waste removal and cleanup.

Wherever possible, prior to accessing a worksite, persons knowledgeable about the worksite will be contacted to identify known site hazards.

#### Tool Restriction:

The use of powered disc saws (cut-off saw, K-5 saw, stihl saw, etc) **MUST NOT** be used to cut AC pipe. The use of such abrasive disc saws will release excessive levels of asbestos fibres into the atmosphere and cause over-exposure to employees, contractors and the public.

### **5.4 Personal Protective Equipment**

Workers will wear protective clothing as specified in our task-specific work procedures to prevent contamination of worker clothing. At a minimum when handling asbestos containing materials, workers will wear fibre impervious coveralls (e.g., Tyvek or similar) with integral head coverings, and elastic cuffs at the wrists and ankles or coveralls.

Lace-less rubber safety boots with protective sole plates and toecaps will be used whenever handling asbestos containing materials.

Workers completing work with asbestos will use all other safety equipment as identified by site procedures, including hard hats, gloves and eye protections. PPE that can effectively be decontaminated may be used in other areas; however, PPE that cannot be decontaminated (e.g., porous equipment such as leather gloves and leather boots) will be disposed of at the end of the shift or kept in sealed bags and only used for asbestos work.

Respirator selection will be completed in accordance with our respirator program.

## **6 EDUCATION AND TRAINING**

Workers will be informed about the contents of this exposure control plan and provided with adequate education and training to work safely with and around materials that contain asbestos.

All personnel that may work in and around areas where asbestos may be located will receive training including the following:

- The hazards of asbestos
- The means of identifying asbestos-containing material at the worksite
- Procedures to be followed in case of an emergency involving the controlled product

In addition, all personnel that may handle properly bagged asbestos waste will also be trained in the following:

- Low risk asbestos procedures
- Use of respirators and other personal protective equipment (e.g., donning and doffing of personal protective equipment, and cleaning and maintenance of respirators)
- The City of Surrey AC Pipe Procedures
- The City of Surrey AC Pipe Safety Talk

In addition to low risk asbestos work, all personnel that may participate in the removal of AC pipe will be trained in the following:

- Moderate risk asbestos procedures
- Any other job-site hazards prior to excavation

Records of training will be kept for at least three years by Occupational Health & Safety as specified in the Occupational Health and Safety Regulation. Training records will be entered into the PeopleSoft Training and Education database.

## **7 HEALTH MONITORING**

When asbestos containing materials are disturbed, asbestos fibres may be made airborne. These airborne fibres present a possible exposure risk. City of Surrey will implement controls to minimize the risk presented by these airborne fibres. Health monitoring for asbestos is a lagging indicator of exposure, with indication of disease only appearing a long time (>10 years) after exposure has occurred.

City of Surrey will focus on risk assessment, safe work procedures and accident/incident investigation to minimize worker exposures.

## **8 SAFE WORK PROCEDURES**

Refer to the City of Surrey “AC Pipe Cutting and Disposal Procedures” – See Appendix A

## **9 DOCUMENTATION**

The following documents will be available in any vehicle utilized by a crew engaged in AC Pipe procedures:

- Pre-Excavation Drawings (As built)
- Completed Pre-Excavation checklist / jobsite hazard identification
- Exposure Control Plan and Safe Work Procedures

The following documents will be available at Public Works and/or through central OH&S:

- Material Safety Data Sheets
- Respirator Fit Test Records
- Training Records
- Asbestos Inventory- AC Pipe- through GIS and As-built records.

Records of asbestos inventories, risk assessments, inspections, and air-monitoring results related to exposures for our workers will be kept for at least 10 years by Occupational Health & Safety.

Records of corrective actions, and training and instruction of our workers will be kept for at least 3 years by Occupational Health & Safety.

## **10 ANNUAL REVIEW**

The exposure control plan must be reviewed at least annually and updated as necessary by the administrator, in consultation with the workplace joint occupational health and safety committee.

## **APPENDIX A: ASBESTOS WORK PROCEDURES**

## **Appendix 1: AC Pipe Handling Procedures**

## **Appendix 2: AC Pipe New Worker Orientation Checklist**