

**1. GENERAL**

1.1 DISCLAIMER

- .1 The following specification, Section 33 14 13.1 – Asbestos Cement Pipe shall be considered a minimum guideline for the Contractor while working with or near asbestos cement (AC) pipe. Where more stringent regulations, requirements, or codes are present the more stringent shall apply. As such the Contractor shall indemnify and hold harmless the Owner and its agents of any undue harm to the Contractor, its sub-contractors and any other party which may through the Contractor agreement have cause to be involved in the Work where asbestos cement (AC) pipe is present. The Contractor will assume the role of Prime Contractor on site and as such shall create, implement, and maintain a safety program in accordance with Section 01 35 23 – Safety Requirements.

1.2 RELATED WORK

- .1 Section 31 23 00 – Excavation, Trenching and Backfilling.
- .2 Section 33 05 13 – Miscellaneous Removals and Adjustments.
- .3 Section 33 14 13 – Watermains.
- .4 Section 33 14 17 – Building Services.

1.3 DEFINITIONS

- .1 Asbestos:
  - .1 The fibrous form of crocidolite, amosite, chrysotile, anthophyllite, actinolite, tremolite, or a mixture containing any of those minerals.
- .2 Asbestos Containing Materials:
  - .1 Vermiculite determined to contain any asbestos when tested according to an approved method; or any material, other than vermiculite, that when tested according to an approved method is determined to contain a proportion of asbestos greater than 0.5% if the material is friable, or a proportion of asbestos greater than 1.0% if the material is non-friable.
- .3 Asbestos Waste:
  - .1 Material that is discarded because there is a reasonable chance that asbestos might be released from it and become airborne, including protective clothing that is contaminated with asbestos.
- .4 f/cc:
  - .1 Fibers per cubic centimetre of air.
- .5 Friable:
  - .1 Material that, when dry, is or can be crumbled, pulverized or powdered by hand pressure.
- .6 Wet Method:
  - .1 A method to prevent the release of airborne asbestos fibers.

#### 1.4 COMPLIANCE REQUIREMENTS

- .1 Contractors are required to comply with applicable legislation, regulations, acts, codes, and policies, including, but not limited to the Alberta and Saskatchewan Occupational Health and Safety, Worker's Compensation Board Standards, industry standards, and municipal requirements while completing asbestos cement pipe removal and disposal operations.
- .2 In any case of conflict or discrepancy, the higher standard shall apply.
- .3 The Contractor shall ensure that all workers suspected to be in contact with or have the potential to be in contact with asbestos containing products, in particular asbestos cement (AC) pipe, shall receive applicable training prior to completing work on the Site where asbestos materials may be located.

#### 1.5 NOTIFICATION REQUIREMENTS

- .1 Asbestos waste shall only be accepted at the City of Lloydminster landfill upon prior notification being issued to the landfill Supervisor no later than seventy-two (72) hours prior to the disposal of the material. The Contractor will be responsible for providing such notification.
  - .1 As part of the notification to the City of Lloydminster landfill personnel, the Contractor shall indicate the anticipated volume of asbestos waste to be generated, the timelines as to when the material will be disposed of at the landfill, the storage and containment method (i.e., Asbestos Waste Bags or Bulk Disposal) and the name of the driver of the carrier and the truck unit number.
- .2 Notification must also be given to a Workplace Health and Safety regional office or the province-wide Contact Centre at least seventy-two (72) hours before beginning the activities that may release asbestos fibers. The Contact Centre telephone number is 1-866-415-8690.

#### 1.6 STANDARDS

- .1 Do asbestos cement pipe removal and disposal and cutting and tapping Work in accordance with the latest edition of the following documents, except where specified otherwise:
  - .1 Alberta Asbestos Abatement Manual;
  - .2 Alberta Asbestos Exposure in Demolition and Renovation Industries;
  - .3 Alberta Occupational Health and Safety Code;
  - .4 Alberta Occupational Health and Safety Code, Explanation Guide; and
  - .5 Saskatchewan Occupational Health and Safety Regulations.
- .2 Asbestos and asbestos waste must be disposed of in conjunction with the City of Lloydminster Landfill Operations Plan, a copy of this plan will be made available to the Contractor at the onset of the program.

1.7 MEASUREMENT AND PAYMENT

- .1 The removal and disposal of asbestos cement (AC) pipe will be measured in lineal metres along the centreline for each size, and depth of pipe removed, as specified within the Bid Forms. Horizontal measurement will be made over the surface, through valves and fittings, after the work has been completed. The unit price shall include the supply of all required asbestos waste disposal bags, asbestos warning tape, snap cutters or wet saws, asbestos hazard warning signs, traffic delineators including "Asbestos Work Zone" signs and sign posts, personal protective equipment including half-mask respirators, disposable coveralls, rubber boots, disposable gloves and all other items reasonably required to remove and dispose of asbestos cement pipe. Also included in the unit price shall be costs to supply all related materials, tools, equipment, labour and supervision, associated with the following clauses, unless otherwise identified within the Bid Forms, as well as the loading, hauling, and disposing of the asbestos cement pipe at the City of Lloydminster landfill, unless otherwise directed by the Engineer or as specified within the Bid Forms..
  - .1 If the existing asbestos cement (AC) watermain is located within the alignment of a watermain to be replaced, the items outlined within the Measurement and Payment clauses of Section 33 14 13 – Watermains, and Section 33 05 13 – Miscellaneous Removals and Adjustments associated with the excavation, trenching, stockpiling, shoring, disconnection of services, trench bottom preparation, dewatering, backfilling and compaction, clean-up, and all other related work shall be included in the lineal metre price to supply and install the new watermain.
  - .2 If the existing asbestos cement (AC) watermain is located outside the alignment of an existing watermain to be replaced, the items associated with the excavation, trenching, stockpiling, shoring, removal of existing pipelines and fixtures, disconnection of services, dewatering, backfilling and compaction, clean-up, and all other related work shall be included in the lineal metre price to remove and dispose of the existing asbestos cement (AC) watermain.
- .2 The drilling and tapping into asbestos cement (AC) pipe will be measured in number of connections made. The unit price shall include the supply of all required asbestos disposal bags, asbestos warning tape, snap cutters or wet saws, asbestos hazard warning signs, traffic delineators including "Asbestos Work Zone" signs and sign posts, personal protective equipment including half-mask respirators, disposable coveralls, rubber boots, disposable gloves and all other items reasonably required to drill and tap into an asbestos cement pipe.

**2. PRODUCTS**

2.1 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- .1 The use of disposable material is to ensure asbestos fibers that can be found in the asbestos cement (AC) pipe debris do not get transferred out of the "Asbestos Work Zone".
- .2 High Efficiency Particulate Air (HEPA) Half-Mask Respirator:
  - .1 HEPA "100" Filter.
  - .2 No single use respirators will be permitted.
- .3 Disposable Coveralls:
  - .1 Impermeable protective coveralls must have a hood, and elastic seals.
- .4 Rubber Boots with no laces.
- .5 Goggles.
- .6 Disposable Gloves.

- .7 Other require personnel protective equipment (PPE) as required.

All reusable PPE and equipment must be cleaned with a damp cloth or a HEPA filtered vacuum cleaner prior to removal from the site.

## 2.2 SPECIAL EQUIPMENT REQUIRED

The special equipment identified below shall be deemed the minimum equipment required to be permitted to complete this Work within the City of Lloydminster. Where alternate requirements are present, the more stringent requirement shall take precedent.

- .1 Asbestos Disposal Bags and/or 6 mil polyethylene rolls.
- .2 Asbestos Warning Tape.
- .3 Water Misting Bottle or Spray Hose.
- .4 Snap Cutters or Wet Saw.
  - .1 Snap Cutter (roller chain cutters) consist of deep penetrating cutting wheels mounted in a chain that is wrapped around the pipe barrel. A cut is made when pressure is applied by means of a hydraulic pump or a manual ratchet depending on the side of the pipe.
  - .2 The use of powered abrasive disc saws (cut-off saws, K-5 saw, STIHL saw, etc.) MUST NOT be used to cut AC pipe where water cannot be introduced into the cutting procedure. The use of such abrasive disc saws will release excessive levels of asbestos fibers into the atmosphere and cause over-exposure.
- .5 Duct Tape, or approved equivalent, for sealing bags.
- .6 Asbestos Hazard Warning Signs.
- .7 Four (4) "candle stick" style traffic delineators for creating the four (4) corners of the "Asbestos Work Zone", or any other suitable posts or stakes approved of by the Engineer.
  - .1 Additional traffic delineators and or barricades may be required depending on the site location, and as directed by the Engineer.

## 3. **EXECUTION**

### 3.1 WORK AREA PREPARATION PROCEDURE – TRENCH EXCAVATION LENGTH <2.4m

- .1 These procedures are to be followed when performing work on AC pipe (which includes cutting, drilling, installing saddles, removing, etc.), in order to minimize fiber release during work activities where the total length of AC pipe to be exposed is less than 2.4m.
- .2 All trades and maintenance personnel and outside contractors shall understand the requirements of these procedures prior to conducting any work on AC pipe. The Contractor will be in control at all times for coordinating activities to ensure that PPE is worn when required.
- .3 Procedure:
  - .1 Excavate a sufficient distance around the AC pipe to assure adequate tool clearance in the area to be cut (or drilled). Care must be taken to avoid disturbance of the asbestos cement pipe through use of tools and equipment, prior to donning the required PPE.
  - .2 A barrier tape with the following warning must be posted around the work area at all entrances to the work area, using stakes to hold it in place (this barrier must be in place immediately prior to doing any work):

**DANGER ASBESTOS  
AUTHORIZED PERSONNEL ONLY  
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA**

- .3 Workers must have (at minimum) a half facepiece NIOSH approved respirator with combination cartridges for particulate (P100) and organic vapours (OV).
  - 3.1.3.3.1 No single use respirators are allowed. Workers shall inspect and clean their respirators prior to each use.
  - 3.1.3.3.2 Workers must be fit tested and properly trained in the use, limitations, and maintenance of their respirators. Proof of fit testing must be provided to the Engineer prior to use on site.
- .4 Labelled asbestos waste bags must be available and placed in the "Asbestos Work Zone" for disposal of protective coveralls and contaminated waste such as sponges and rags.
- .5 A five (5) gallon bucket with clean potable water and disposable towels should be positioned at the entrance to the "Asbestos Work Zone" for personal decontamination. Two (2) or more additional buckets of water shall be available for cleaning tools and equipment. Ensure that sufficient water is available in the "Asbestos Work Zone" for tool and equipment decontamination.

**3.2 WORK AREA PREPARATION PROCEDURE – TRENCH EXCAVATION LENGTH >2.4m**

- .1 These procedures are to be followed when performing work on AC pipe (which includes cutting, drilling, installing saddles, removing, etc.), in order to minimize fiber release during work activities where the total length of AC pipe to be exposed is greater than 2.4m.
- .2 All trades and maintenance personnel and outside contractors shall understand the requirements of these procedures prior to conducting any work on AC pipe. The Contractor will be in control at all times for coordinating activities to ensure that PPE is worn when required.
- .3 Procedure:
  - .1 When removal of an existing AC pipe is required in lengths greater than 2.4m, i.e., bulk removal, the Contractor shall prepare an "Asbestos Work Zone" outside of the trench alignment where removed AC pipe can be stockpiled, moistened, and monitored until the AC pipe can be disposed of in either a bulk carrier or an 'Asbestos Waste Bag'. In this scenario, the "Asbestos Work Zone" shall be located a minimum of 10.0m away from any residence or business and shall be located in an area where minimal traffic is expected to be encountered. The "Asbestos Work Zone" shall be located in a well-ventilated area with unobstructed access to a water supply and appropriate first aid stations.
  - .2 A barrier tape with the following warning must be posted around the "Asbestos Work Zone" at all entrances to the work area, using stakes to hold it in place (this barrier must be in place immediately prior to doing any work):

**DANGER ASBESTOS  
AUTHORIZED PERSONNEL ONLY  
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA**

- .3 Workers must have (at minimum) a half facepiece NIOSH approved respirator with combination cartridges for particulate (P100) and organic vapours (OV).
  - 3.2.3.3.1 No single use respirators are allowed. Workers shall inspect and clean their respirators prior to each use.
  - 3.2.3.3.2 Workers must be fit tested and properly trained in the use, limitations, and maintenance of their respirators. Proof of fit testing must be provided to the Engineer prior to use on site.
- .4 Labelled asbestos waste bags must be available and placed in the "Asbestos Work Zone" for disposal of protective coveralls and contaminated waste such as sponges and rags.
- .4 A five (5) gallon bucket with clean potable water and disposable towels should be positioned at the entrance to the "Asbestos Work Zone" for personal decontamination. Two (2) or more additional buckets of water shall be available for cleaning tools and equipment. Ensure that sufficient water is available in the "Asbestos Work Zone" for tool and equipment decontamination.

### 3.3 CUTTING AND DRILLING PROCEDURE

- .1 These procedures are to be followed when performing work on AC pipe (which includes cutting, drilling, installing saddles, removing, etc.), in order to minimize fiber release during work activities. All trades and maintenance personnel and outside contractors shall understand the requirements of these procedures prior to conducting any work on AC pipe. The Contractor will be in control at all times for coordinating activities to ensure that PPE is worn when required.
- .2 Procedure:
  - .1 Workers shall don a respirator, perform positive and negative fit check, and put on disposable coveralls, and other appropriate PPE prior to performing work that disturbs the AC pipe (e.g., cutting, drilling, removing, etc.). Use duct tape or other effective means to ensure that the coveralls fit snugly to the contours of the wearer and will not be subjected to tearing when the worker bends or turns. Ensure the elastic seals where the coveralls meet with the work boots are over the boots and sealed with the duct tape. Follow the same procedure for wearing disposable gloves (position elastic seal and tape together with duct tape). This PPE must be worn at all times while within the "Asbestos Work Zone".
  - .2 Once the work has commenced on the pipe, workers, equipment, and materials cannot leave the "Asbestos Work Zone", as defined within Sections 3.2 and 3.2, without going through the decontamination procedure. Only personnel authorized by the Contractor in charge of the worksite and who are equipped with the proper PPE may enter the "Asbestos Work Zone".
  - .3 The area of AC pipe affected by disturbance must be sufficiently wetted prior to the disturbance to remove any dirt, sand or gravel.
  - .4 Using the wet method, apply water to the area being cut and continue until the cutting has been completed. Low flow water must be constantly applied to the area being cut and continued until the cutting is complete. Ensure the water is applied in sufficient quantities so that the area being cut is continuously wet and no asbestos fibers are being released. (If using wet diamond saw, ensure that the water flow is 1-3 gallons per minute). This method of cutting can be used for removing all lengths of AC pipe.
  - .5 Where sections of AC pipe greater than 2.4m are to be removed, i.e., bulk removal, the Contractor will be permitted to break the AC pipe using mechanical excavation

equipment and stockpile the AC pipe in a location such that approved personnel can collect the removed AC pipe and transport it to the "Asbestos Work Zone" or the bulk carrier. While breaking the AC pipe using this method, the AC pipe shall be maintained in a wet condition. Where the AC pipe is to be removed using mechanical excavation equipment all personnel within the trench shall at a minimum wear a half facepiece NIOSH approved respirator with combination cartridges for particulate (P100) and organic vapours (OV). Personnel responsible for collecting the removed AC pipe from the excavated material and transporting it to either the "Asbestos Work Zone" or the bulk carrier must wear all PPE required to work within the "Asbestos Work Zone" at all times while excavation and removal procedures are being completed.

- .6 Operate cutting and drilling tools (and any other equipment used for disturbing AC pipe) in accordance with the manufacturer's instructions, making sure that water is continually applied in sufficient quantities to minimize dust. If the use of snap cutters is impracticable (i.e., large service mains), then a wet diamond saw may be used. Take create care as this method releases more fibers than snap cutting.
- .7 Detach the cutting equipment and repeat the above mentioned cutting steps. Move to the next cutting location and wet the cutting area prior to the cut. Again, apply water to the area being cut and continue until the cutting has been completed.
- .8 Once the work in the excavation area has been completed, move any tools and materials from the "Asbestos Work Zone" to the decontamination area.

### 3.4 CLEAN-UP AND DECONTAMINATION

- .1 Tools and materials used to perform cutting and/or drilling of AC pipe will be thoroughly rinsed in a bucket of water and any remaining pieces of debris shall be wiped off the tools using a damp cloth (or cleaned with a HEPA filtered vacuum). Tools and materials must be thoroughly washed and inspected (to ensure there is no asbestos contamination) before being removed from the "Asbestos Work Zone". Materials contaminated with asbestos will be rinsed with clean water and placed in a labelled asbestos waste disposal bag (see below). Properly sealing disposal bags of asbestos waste will follow this procedure.
- .2 Procedure:
  - .1 The workers shall clean-up the area and place all asbestos contaminated waste (including PPE, rags and sponges used in work area) into a labeled 'Asbestos Waste' disposal bag. Gently squeeze the bag to expel the air.
  - .2 Twist tightly the unused top portion of the bag into a tail and seal with duct tape at the base of the tail.
  - .3 Take the leftover twisted tail section of the bag and bend it around to make a loop and attach it to the base of the tail using the duct tape (this seals the bag and makes a handle).
  - .4 Place the first bag into the second bag and repeat the sealing procedure.

Further steps to decontaminate workers' PPE and tools are noted below:

- .1 PPE and tools that are to be reused are cleaned and immersed in a bucket of water, followed by a second immersion in a second, clean bucket of water. Inspect thoroughly for asbestos contamination and repeat if necessary until all asbestos containing materials have been removed. Place the object outside the authorized work area.

- .2 If the object is too large to be washed in the buckets of water, such as a shovel or wrecking bar, use a wet cloth to wipe them down until visually "clean". Inspect thoroughly for asbestos contamination and repeat if necessary until all material has been removed from the item.
- .3 Workers will remove debris from protective clothing using a damp cloth or sponge (or a HEPA filtered vacuum), wash their hands, remove the disposable suits, and place them into a labeled 'Asbestos Waste Bag' (following the sealing of disposal bag procedures noted above).
- .4 The worker will leave the work area boundary while still wearing a respirator and thoroughly wash hands, respirator, and face with a clean sponge or damp cloth from the designated clean water bucket. This procedure is known as 'personal decontamination'. The worker will seal the HEPA filters with duct tape and place the respirator and filters into a sealable bag for storage.

### 3.5 DISPOSAL OF ASBESTOS CONTAMINATED WASTE

- .1 Depending on the length of AC pipe to be removed cut or break the pipe into short enough pieces to fit into the 'Asbestos Waste Bags' while still in the trench, or to manageable lengths as to be transported to the "Asbestos Work Zone" or bulk carrier.
- .2 Place the pipe piece and any visible pieces or debris into the 'Asbestos Waste Bag'.
- .3 Twist the top of the bag to close it, and then fold over twisted portion and use duct tape to tape the twisted portion to the bag.
- .4 Place the bagged section near the edge of the "Asbestos Work Zone".
- .5 Wipe down the Asbestos Waste Bag with a wet disposable cloth to remove any asbestos debris.
- .6 Place the bag into a second Asbestos Waste Bag and duct tape closed the same way.
- .7 Where use of 'Asbestos Waste Bags' is not applicable (i.e. length of AC Pipe to be removed is longer than 1.20m or too large for the bag to contain) Polyethylene drop sheets can be utilized. Two (2) layers of Polyethylene drop sheets will be placed beneath the section of AC pipe which has been 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.
- .8 Place the bag in back of designated disposal truck and dispose of at the City of Lloydminster landfill.
  - .1 Asbestos waste must be handled in accordance with Saskatchewan's Dangerous Goods Transportation Act and Regulations (DGTA/R), Saskatchewan's Environmental Management and Protection Act., 2002 with respect to The Municipal Refuse Management Regulations and Saskatchewan and Alberta Occupation Health and Safety Act.



- .9 To dispose of bulk asbestos cement (AC) pipe the Contractor shall handle the material according to the following:
  - .1 Vehicles or container bins transporting bulk asbestos must be lined with 6 mil polyethylene sheeting and covered in such a way as to prevent asbestos fibers and particulate from escaping during storing and transportation.
  - .2 Bulk asbestos should be moistened, and maintained in a moist state, to prevent the escape of asbestos fibers during storing and transportation.
  - .3 The polyethylene liner/cover used in the transportation of bulk asbestos waste should be disposed of along with the asbestos waste.
  - .4 Carriers must ensure that when discharging a bulk load of asbestos from a vehicle, that the polyethylene liner is completely discharged with the asbestos waste and the methods, or methods of closure used on the liner remain in place so as to not allow any loose asbestos waste material to escape the disposal cell.
  - .5 The surfaces of vehicles and reusable containers which have been in direct contact with asbestos waste, that is not being transported in Asbestos Waste Bags should be thoroughly cleaned prior to leaving the disposal site. Only a minimum of water, as necessary to wet the asbestos fibers should be used during cleaning.
- .10 Unloading asbestos should be carried out so that no loose asbestos waste or punctured, broken, or leaking containers or bags are landfilled. Any loose asbestos or broken, punctured, or leaking containers or bags should be double bagged, in another two (2) 6 mil polyethylene bags, immediately upon discovery.
- .11 Asbestos cement (AC) pipe waste must never be left in the back of a carrier or within a disposal bin unless the area is clearly identified on all four (4) sides as:

**Asbestos Containing Materials – Avoid Creating Dust  
Cancer and Lung Disease Hazard**

and covered with 6 mil polyethylene sheets and anchored in place with native backfill material.

**END OF SECTION**