

## 1 GENERAL

### 1.01 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
  - .1 Removing or disturbing non-friable asbestos-containing materials by breaking, cutting, drilling, abrading, grounding, sanding, or vibrating if:
    - .1 The material is not wetted to control the spread of dust or fibres, and
    - .2 The work is done only by means of non-powered hand-held tools.
  - .2 Removing or disturbing non-friable asbestos-containing materials by breaking, cutting, drilling, abrading, grounding, sanding, or vibrating if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
  - .3 For asbestos abatement projects requiring greater precautions, refer to Section 02 82 00.03 - Asbestos Abatement - High Risk Precautions.

### 1.02 RELATED REQUIREMENTS

- .1 Section 01 14 25 Designated Substances.
- .2 Section 02 82 00.03 Asbestos Abatement - High Risk Precautions.

### 1.03 REFERENCE STANDARDS

#### Federal Legislation and Reference Standards

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .3 Government of Canada
  - .1 Canada Labour Code (R.S.C., 1985, c. L-2)
  - .2 Canada Occupational Health and Safety Regulations (SOR/86-304)
  - .3 Public Services and Procurement Canada Asbestos Management Directive
  - .4 Public Services and Procurement Canada Asbestos Management Standard
  - .5 National Joint Council Occupational Health and Safety Directive
  - .6 Technical guideline to asbestos exposure management program
  - .7 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB-1.205-(94), Sealer for Application of Asbestos Fibre Releasing Materials.
- .4 Underwriters' Laboratories of Canada (ULC)
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 WHMIS Safety Data Sheets (SDS).

#### Provincial Legislation and Reference Standards

- .6 Government of Ontario
  - .1 Ontario Regulation 278/05, Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations (O.Reg. 278/05)
  - .2 Environmental Protection Act, R.S.O. 1990, c. E.19.3
  - .3 Ontario Regulation 347/90, General - Waste Management (O.Reg. 347/90)
  - .4 Transportation of Dangerous Goods Act, R.S.O. 1990, c. D.1
  - .5 Transportation of Dangerous Goods Regulations (SOR/2001-286)

#### 1.04 DEFINITIONS

- .1 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .2 Asbestos-Containing Materials (ACMs): materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .3 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs
- .4 Authorized Visitors: Visitors provided authorization for site access by the Departmental Representative, and representatives of regulatory agencies.
- .5 Competent worker: in relation to specific work, means a worker who:
  - .1 Is qualified because of knowledge, training, and experience to perform the work.
  - .2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.
  - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .6 Friable material: means material that:
  - .1 When dry, can be crumbled, pulverized, or powdered by hand pressure, or
  - .2 is crumbled, pulverized, or powdered.
- .7 Glove Bag: prefabricated glove bag as follows:
  - .1 Minimum thickness 0.25 mm polyvinyl-chloride bag.
  - .2 Integral 0.25 mm thick polyvinyl-chloride gloves and elastic ports.
  - .3 Equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag.
  - .4 Straps for sealing ends around pipe.
- .8 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.
- .9 Non-Friable Material: material that when dry cannot be crumbled, pulverized, or powdered by hand pressure.
- .10 Occupied Area: any area of building or work site that is outside Asbestos Work Area.
- .11 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

- .12 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.

#### 1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit proof satisfactory to the Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .2 Submit Provincial and/or local requirements for Notice of Project Form.
- .3 Submit proof of Contractor's Asbestos Liability Insurance.
- .4 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .5 Submit proof satisfactory to Departmental Representative that all asbestos workers have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene, entry and exit from Asbestos Work Area, aspects of work procedures and protective measures while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .6 Submit proof that supervisory personnel have attended an appropriate asbestos abatement course, approved by Departmental Representative. Minimum of one supervisor for every ten workers.
- .7 Submit Worker's Compensation Board status and transcription of insurance.
- .8 Submit documentation including test results, fire, and flammability data, and WHMIS Safety Data Sheets (SDS) for chemicals or materials including:
  - .1 Encapsulants;
  - .2 Amended water;
  - .3 Slow drying sealer.
- .9 Submit proof satisfactory to the Departmental Representative that the workers have appropriate respirator training and fit testing. Respirators must be personally issued.

#### 1.06 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:
  - .1 Safety Requirements: worker and visitor protection.
    - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
      - .1 Air purifying half-mask respirator with N-, R- or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to the Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the

respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected, and inspected after use on each shift. Damaged or deteriorated parts are to be replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean, and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

- .2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.
- .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.
- .5 Ensure workers wash hands and face when leaving Asbestos Work Area.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .7 Visitor Protection:
  - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
  - .2 Instruct Authorized Visitors in the use of protective clothing, respirators, and procedures.
  - .3 Instruct Authorized Visitors in proper procedures to be followed in entering and exiting from Asbestos Work Area.

## 1.07 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate non-hazardous, uncontaminated, and/or decontaminated waste materials for reuse and/or recycling, if applicable.
- .2 Remove from the site and dispose of packaging materials at appropriate recycling facilities.

- .3 Collect and separate for disposal non-hazardous, uncontaminated, and/or decontaminated building materials for recycling in accordance with a Waste Management Plan, if applicable.
- .4 Separate for reuse and/or recycling and place in designated containers non-hazardous, uncontaminated, and/or decontaminated steel, metal, plastic, and masonry (block or brick) waste in accordance with the Waste Management Plan, if applicable.
- .5 Place materials defined as hazardous or contaminated in the designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Fold metal banding, flatten and place in designated area for recycling.
- .8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15 mm bags or leak proof drums. Label containers with appropriate warning labels.
- .9 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

#### 1.08 EXISTING CONDITIONS

- .1 Refer to the Specification Section 01 14 25 Designated Substances for details on asbestos-containing materials.
- .2 Notify the Departmental Representative of asbestos-containing material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from the Departmental Representative.

#### 1.09 SCHEDULING

- .1 Hours of Work: perform work involving asbestos abatement activities outside of normal working hours. Include in Contract Sum additional costs due to this requirement.

#### 1.10 PERSONNEL TRAINING

- .1 Before beginning Work, provide to the Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, the use of glove bags (if required), in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, at minimum:
  - .1 Fitting of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Disinfecting of equipment.
  - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Drop and Enclosure Sheets:
  - .1 Polyethylene: 0.15 mm thick.
  - .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by the Departmental Representative, mixed with water in concentration to provide adequate penetration and wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate containers.
  - .1 Inner container: 0.15 mm thick sealable polyethylene bag (or where glove bag method is used, glove bag itself).
  - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
  - .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site.
- .4 Glove bag:
  - .1 Acceptable materials: product in configuration suitable for work, or alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.
  - .2 The glove bag to be equipped with:
    - .1 Sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period.
    - .2 Valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct, or similar structure.
    - .3 A tool pouch with a drain.
    - .4 A seamless bottom and a means of sealing off the lower portion of the bag.
    - .5 A high strength double throw zipper and removable straps if the bag is to be moved during the removal operation.
- .5 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .6 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .7 Encapsulant: Surface film forming with the required penetrating specifications conforming to CAN/CGSB-1.205 based on the material type.

### 3 EXECUTION

#### 3.01 SUPERVISION

- .1 Minimum of one Supervisor for every ten workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

#### 3.02 PROCEDURES

- .1 Do construction occupational health and safety in accordance with the applicable health and safety legislation.
- .2 Before beginning Work, at each access to Asbestos Work Area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
  - .1 Use HEPA vacuum or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.
  - .2 Do not use compressed air to clean up or remove dust from any surface.
- .3 Before beginning work, remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.
  - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.
  - .2 When removing suspended ceilings and walls themselves do not enclose the work area, and when removing asbestos-containing material from piping or equipment and a "glove bag" method is not used, erect an enclosure of polyethylene sheeting around work area, shut off mechanical ventilation system serving work area, and seal ventilation ducts to and from work area.
- .5 Before removing suspended ceilings, remove friable material on upper surfaces using HEPA vacuum equipment.
  - .1 Remove and clean surfaces of ceiling panels using HEPA vacuum, wrap clean panels in 0.10 mm thick polyethylene, and store in building as directed by the Departmental Representative.
  - .2 Clean "T" grid suspension system, disconnect, wrap in 0.10 mm thick polyethylene, and store in building as directed by Engineer.
- .6 Remove loose material by HEPA vacuum; thoroughly wet friable material containing asbestos to be removed or disturbed before and during work unless wetting creates hazard or causes damage.
  - .1 Use garden reservoir type low - velocity sprayer or airless spray equipment capable of producing mist or fine spray.
  - .2 Perform work in a manner to reduce dust creation to lowest levels practicable.
- .7 Pipe Insulation Removal Using Glove Bag:

- .1 A glove bag is not to be used to remove insulation from a pipe, duct, or similar structure if:
  - .1 It may not be possible to maintain a proper seal for any reason including, without limitation:
    - .1 The condition of the insulation.
    - .2 The temperature of the pipe, duct, or similar structure.
  - .2 The bag could become damaged for any reason including, without limitation.
    - .1 The type of jacketing.
    - .2 The temperature of the pipe, duct, or similar structure.
- .2 Upon installation of the glove bag, inspect bag for any damage or defects. If any damage or defects are found, the glove bag is to be repaired or replaced. The glove bag to be inspected at regular intervals for damage and defects, and repair or replaced, as appropriately. The asbestos-containing contents of the damaged or defective glove bag found during removal are to be wetted and the glove bag and its contents are to be removed and disposed of in an appropriate waste disposal container. Any damaged or defective glove bags are not be reused.
- .3 Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe with cloth straps.
- .4 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.
- .5 Insert nozzle of garden reservoir type sprayer into bag through valve and wash down pipe and interior of bag thoroughly. Wet surface of insulation in lower section of bag.
- .6 To remove bag after completion of stripping, wash top section and tools thoroughly. Remove air from top section through elasticized valve using a HEPA vacuum. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in water. Remove second strap and zipper. Fold over into waste container and seal.
- .7 After removal of bag ensure that pipe is free of residue. Remove residue using HEPA vacuum or wet cloths. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow drying sealer to seal in any residual fibres.
- .8 Upon completion of Work shift, cover exposed ends of remaining pipe insulation with polyethylene taped in place.
- .8 Frequently and at regular intervals during the work and immediately on completion of work:
  - .1 Dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a waste container, and
  - .2 Drop sheets to be wetted and placed in a waste container as soon as practicable.
- .9 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .10 Cleanup:
  - .1 Frequently during work and immediately after completion of work, clean up dust and asbestos-containing waste using HEPA vacuum or by damp mopping.



- .2 Place dust and asbestos-containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
- .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
- .4 Seal waste bags and remove from the Site. Dispose of in accordance with requirements of Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of the hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.
- .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

### 3.03 AIR MONITORING

- .1 From the beginning of the work until completion of cleaning operations, daily air samples will be collected outside and inside of the Asbestos Work Areas in accordance with the federal health and safety requirements.
- .2 If air monitoring shows that areas outside of the Asbestos Work Areas are contaminated, enclose, maintain, and clean these areas in same manner as that applicable to Asbestos Work Area.
- .3 Ensure that respiratory safety factors are not exceeded.
- .4 During the course of Work, the Departmental Representative will measure fibre content of air outside work areas by means air samples analyzed by Phase Contrast Microscopy (PCM). When an Asbestos Work Area includes a decontamination or clean room, this room will be included as part of the daily air monitoring.
  - .1 Stop Work when PCM measurements exceed 0.05 f/cc and correct procedures.
- .5 Final air monitoring to be conducted as follows: After Asbestos Work Area has passed visual inspection and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period has passed, the Departmental Representative will perform aggressive air monitoring within the Asbestos Work Area.
  - .1 Final air monitoring results must show fibre levels of less than 0.01 f/cc.
  - .2 If air monitoring results show fibre levels in excess of 0.01 f/cc, re-clean work area and apply another acceptable coat of lock-down agent to surfaces.
  - .3 Repeat as necessary until fibre levels are less than 0.01 f/cc.
  - .4 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION