

## **1 GENERAL**

### **1.01 RELATED WORK**

- .1 Protection of salvaged items.
- .2 Removal and making safe of existing mechanical and electrical services and equipment.
- .3 Security and erecting of temporary hoardings.

### **1.02 SCOPE OF WORK**

The Contractor will negotiate with the Departmental Representative, for each site. A breakdown of cost will be submitted with each quote to be reviewed and approved by the Departmental Representative. The work will include the following, but not necessarily be limited to:

- .1 Removal/Reinstallation/Disposal/Accommodations (if required)/Materials for construction operations will include the following:
  - .1 Mobilization and Demobilization of all equipment necessary to make work progress during for each call-up.
  - .2 Demolition and removal will consist of, but not necessarily limited to, the demolition, removal and disposal of miscellaneous hazardous and non-hazardous items, as designated and directed by the Departmental Representative to facilitate the installation of new materials and equipment to be installed under the terms of the Standing Offer. Remove resultant debris from the site on a daily basis.
    - .1 Supply, Delivery of Materials and any equipment, tools required to do the work specified in each scope.
    - .2 Transportation of all materials to a Registered Environmental Site.
    - .3 Disposal Slips are to be submitted with the invoice. No payment will be made until disposal slips are submitted.

### **1.03 MEASUREMENT FOR PAYMENT**

#### Mobilization and Demobilization/Site Access and Reinstatement/Transportation

The Contractor will negotiate with the Departmental Representative, for each site:

- .1 Cost for Mobilization and Demobilization of all necessary equipment for each call-up. Only one mobilization and demobilization will be paid per call-up.
- .2 If Required, cost for site access road and removal once the project is complete.
- .3 Transportation and disposal of all materials to a Registered Environmental Site.
  - .1 Disposal Slips are to be submitted with the invoice. No payment will be made until disposal slips are submitted.
- .4 Demolition and removal will consist of, but not necessarily limited to, the demolition, removal and disposal of miscellaneous hazardous and non-hazardous

- items, as designated and directed by the Departmental Representative to facilitate the installation of new materials and equipment to be installed under the terms of the Standing Offer. Remove resultant debris from the site on a daily basis.
- .5 A breakdown of cost will be submitted with each quote, indicating each item and associated cost, and totaled before taxes, to be reviewed and approved by the Departmental Representative.
  - .6 Hourly labour rates will be incidental to this section.

#### **1.04 QUALITY ASSURANCE**

- .1 Requirements of Regulatory Agencies:
  - .1 Conform to the requirements of all pertinent codes, by-laws and regulations.
  - .2 Conform to the requirements of NFPA 51B Fire Prevention in use of cutting and welding processes.
- .2 Carry out demolition in strict accordance with provincial and municipal regulations as applicable.

#### **1.05 JOB CONDITIONS**

- .1 Protection:
  - .1 Protect immediate and adjacent property against damage which might occur from falling debris or other cause; do not interfere with use of or safe passage to and from building.
  - .2 Take precautions to guard against movement or settlement of adjacent portions of structure; design, provide and place bracing or shoring as required; be responsible for safety and support of such elements; be liable for any such movement or settlement, any damage or injury caused thereby or resulting therefrom. If at any time safety of any adjacent portion of building appears to be endangered, cease operations, notify Departmental Representative, take precautions to support structure; do not resume operations until permission has been granted. If such movement or settlement of adjacent portion of building is caused by negligence or default of Contractor, restore the structural integrity of the structure to the Departmental Representative's design at no extra cost. When Departmental Representative considers additional bracing or shoring necessary to safeguard or prevent such movement or settlement, install bracing and shoring upon order.
  - .3 Should any demolition of building commence before any new construction work, provide and maintain legal and necessary guards, railings, lights, warning signs, morality lights and watchmen during execution of work to fully protect all persons from loss, damage, death or injury through neglect, carelessness or incompetence of Contractor or his employees or condition or handling of materials.
- .2 Maintaining Traffic:
  - .1 Do not close nor obstruct, place nor store materials in roadways, sidewalks, alleys, stairways, doorways or passageways beyond the designated area of construction without approval.
  - .2 Conduct operations with minimum interference with roadways, sidewalks, alleys or passageways.

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**2 PRODUCTS**

**2.01 GENERAL**

- .1 Unless otherwise indicated, all materials requiring demolition and not forming permanent part of the building shall become the property of the Departmental Representative. The Contractor shall review with the Departmental Representative the extent of items to be removed from the site prior to disposal by the Contractor.

**3 EXECUTION**

**3.01 GENERAL**

- .1 When contaminated or dangerous material is encountered not specified in the scope of work, contact the Departmental Representative for further instructions. Selling from site is not permitted.
- .2 Contractors as part of this Standing Offer will arrange notify the Departmental Representative 72 hours to request material testing.
- .3 Demolition of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos or pipe covering containing asbestos be encountered in the course of demolition work, that isn't part of the scope of work, stop work and notify the Departmental Representative immediately. Do not proceed until written instructions have been received from the Departmental Representative.
- .4 When making alterations to existing building, confine operations to those parts of building which are to be changed and exercise great care; do not damage existing construction beyond that necessary for carrying out of new work and make good any such damage in every respect. Do not interfere with the operation within existing building.
- .5 During demolition operations, keep work wetted down thoroughly to prevent dust and dirt rising.
- .6 Arrange with appropriate trades to have all services within and leading from existing building elements being demolished to be disconnected and sealed as applicable.
- .7 Remove resultant debris from site.
- .8 Provide all demolition required to permit the various parts of the work.
- .9 Remove elements that are continuous with or connected to that which is to remain in a manner to preserve the integrity, and leave good that which is to remain and allow for efficient completion of the work.
- .10 All new openings in reinforced concrete block or reinforced concrete to be saw-cut.
- .11 At end of day's work, leave work in safe condition so that no part is in danger of toppling or falling.

**END OF SECTION**





- .4 Storage and Handling Requirements:
  - .1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
  - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
  - .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
  - .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
    - .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
    - .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.
  - .5 Transfer of flammable and combustible liquids is prohibited within buildings.
  - .6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
  - .7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
  - .8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
  - .9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
  - .10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
    - .1 Store hazardous materials and wastes in closed and sealed containers.
    - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
    - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
    - .4 Segregate incompatible materials and wastes.
    - .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
    - .6 Store hazardous materials and wastes in secure storage area with controlled access.
    - .7 Maintain clear egress from storage area.
    - .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
    - .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

- .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .11 When hazardous waste is generated on site:
  - .1 Co-ordinate transportation and disposal with Departmental Representative.
  - .2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
  - .3 Use licensed carrier authorized by provincial authorities to accept subject material.
  - .4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
  - .5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
  - .6 Only trained personnel handle, offer for transport, or transport dangerous goods.
  - .7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.
  - .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.
  - .9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.
- .12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .13 Report spills or accidents immediately to Departmental Representative and Consultant. Submit a written spill report to Departmental Representative within 24 hours of incident.

**1.6 SCHEDULING**

- .1 Hours of Work: perform work during normal working hours unless specified otherwise in Statement of Work.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Description:
  - .1 Bring on site only quantities of hazardous material required to perform Work.



- .3 Dispose of waste at a licensed facility. However, recycle fluorescent light tubes (if applicable).
- .3 Ozone-Depleting Substances (ODSs)
  - .1 Refer to Scope of Work for indications on the possibility whether ozone depleting substances (ODSs) may be present.
  - .2 Should dismantling and disposal of HVAC units and other refrigeration equipment be required, ODSs (if present) within equipment are to be drained and recaptured by licensed technicians in accordance with the Federal Halocarbons Regulations, complete with appropriate support documentation to be provided to the Departmental Representative.
  - .3 Waste transportation to be conducted in accordance the Federal Transportation of Dangerous Goods Regulation.
  - .4 Waste disposal to be conducted in accordance with the PEI Ozone Layer Protection Regulations (EC691/94).
- .4 Silica
  - .1 Silica may be present in concrete, cement, mortars, ceramic wall and floor tiles, plaster and drywall (gyproc) finishes, acoustic ceiling tiles, etc. which may be present in various locations throughout the building/facility.
  - .2 When silica-containing materials are to be removed during demolition activities, ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by the ACGIH TLV-TWA limit of 0.025 mg/m<sup>3</sup> occupational exposure limit. This would include, but not be limited to, the following:
    - .1 Providing workers with respiratory protection
    - .2 Wetting the surface of the materials to prevent dust emissions
    - .3 Providing workers with facilities to properly wash prior to exiting the work area
    - .4 Providing dust control to mitigate the potential for demolition dust to escape from the work area into public and/or adjacent areas

### 3.2 CLEANING

- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for reuse and recycling.
  - .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

- .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
- .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
- .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
- .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
- .6 Dispose of hazardous wastes in timely fashion in accordance with applicable federal and provincial regulations.
- .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
- .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
  - .1 Hazardous wastes recycled in manner constituting disposal.
  - .2 Hazardous waste burned for energy recovery.
  - .3 Lead-acid battery recycling.
  - .4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 01 35 29.06 - Health and Safety Requirements
- .3 Section 01 74 11 - Cleaning

**1.2 REFERENCES**

- .1 Canadian Environmental Protection Act, 1999 (CEPA 1999)
  - .1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
- .2 Department of Justice Canada (Jus)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) - current to November 24, 2015.
  - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286) - current to November 24, 2015.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .4 National Research Council Canada Institute for Research in Construction (NRC-IRC)
  - .1 National Fire Code of Canada-2010.
- .5 Human Resources and Social Development Canada (HRSDC).
  - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .6 Recommendations to Fisheries and Oceans Canada on Acceptable Levels of Mercury in Lighthouses and other Buildings - February 2003.
- .7 Prince Edward Island Department of Communities, Land and Environment (PEIDCLE).
  - .1 Mercury-Containing Materials Management, Updated June 1, 2015.
- .8 Prince Edward Island Occupational Health & Safety Act (OSHA), R.S.P.E.I - Updated 2013.

**1.3 DEFINITIONS:**

- .1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

- .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- .4 Mercury Abatement: primary work involving the containment, control removal, treatment of mercury, or mercury-containing materials.
- .5 Mercury Vapor Analyzer: Unit to measure mercury vapour measurements with a detection range of 0.0005 mg/m<sup>3</sup> to 0.999 mg/m<sup>3</sup> (e.g., Jerome® J405 Mercury Vapor Analyzer).
- .6 Mercury recovery vacuum: Dry recovery vacuum with a polyethylene tank that includes activated carbon for the adsorption of mercury vapor, and contains a true HEPA filter and a mercury separator.
- .7 Authorized Visitors: Public Works and Government Services Canada (PWGSC), Fisheries and Oceans Canada, Environmental Consultant, representatives of regulatory agencies and any visitor approved by PWGSC and/or Fisheries and Oceans Canada.
- .8 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. For protection of underlying surfaces from damage and to prevent contamination entering in clean areas.
- .9 Fast-dry lacquer with grit: A clear or colored wood finish that dries by solvent evaporation or a curing process that produces a hard, durable finish and is used to seal residual mercury to the surfaces.
- .10 Exposure limit for mercury: exposure, without regard to use of respirators, to airborne concentrations of mercury of 0.025 mg/m<sup>3</sup> calculated as 8 hour time weighted average (TWA).
- .11 Competent person: individuals capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to the Departmental Representative that suitable arrangements have been made to dispose of hazardous waste in accordance with requirements of authority having jurisdiction.
- .3 Provide proof of Contractor's General Environmental Liability Insurance.
- .4 Quality Control:

- .1 Provide Departmental Representative necessary permits for transportation and disposal of hazardous waste and proof that hazardous waste has been received and properly disposed at approved facilities.
- .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of hazardous waste exposure, respirator use, dress, and aspects of work procedures and protective measures.
- .5 Submit Workers' Compensation Board of Nova Scotia status and transcription of insurance.

**1.5 QUALITY ASSURANCE**

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to mercury abatement, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .2 Safety Requirements: worker and visitor protection.
    - .1 Protective equipment and clothing to be worn by workers and visitors in work Area include:
      - .1 Use of a half face respirator equipped with 3M™ Mercury Vapor Cartridges (3M™ 6009), nitrile gloves, rubber boots, and Tychem F chemical protective overalls sealed at the wrists and ankles.
      - .2 Eating, drinking, chewing, and smoking are not permitted in work area.
      - .3 Ensure workers wash hands and face when leaving work area.
      - .4 Visitor Protection:
        - .1 Signage to appear on the exterior of the lightstation warning of mercury present during abatement activities.
        - .2 Provide approved respirators to Authorized Visitors to work areas.
        - .3 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.

**1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

- .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
- .4 Storage and Handling Requirements:
  - .1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
  - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
  - .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
  - .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
    - .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
    - .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.
  - .5 Transfer of flammable and combustible liquids is prohibited within the building.
  - .6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
  - .7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
  - .8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
  - .9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
  - .10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
    - .1 Store hazardous materials and wastes in closed and sealed containers.
    - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
    - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
    - .4 Segregate incompatible materials and wastes.
    - .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
    - .6 Store hazardous materials and wastes in secure storage area with controlled access.
    - .7 Maintain clear egress from storage area.
    - .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

- .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
- .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .11 When hazardous waste is generated on site:
  - .1 Co-ordinate transportation and disposal with Departmental Representative.
  - .2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
  - .3 Use licensed carrier authorized by provincial authorities to accept subject material.
  - .4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility that will accept material and it is licensed to accept this material.
  - .5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
  - .6 Only trained personnel handle, offer for transport, or transport dangerous goods.
  - .7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.
  - .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.
  - .9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.
- .12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .13 Report spills or accidents immediately to Departmental Representative and Consultant. Submit a written spill report to Departmental Representative within 24 hours of incident.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Description:
  - .1 Bring on site only quantities of hazardous material required to perform Work.
  - .2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

- .2 Products and equipment:
  - .1 Mercury recovery vacuum.
  - .2 Mercon X Mercury Decontaminant and Mercury Vapor Suppressant.
  - .3 Fast-dry lacquer (with grit). MPI 84 or equivalent.

### Part 3 Execution

#### 3.1 HAZARDOUS MATERIALS ABATEMENT

- .1 Scope of Mercury Abatement Activities
  - .1 Mercury abatement shall be conducted to remove mercury in droplet form and contain/suppress mercury vapours as identified in the statement of work (SOW), in accordance with applicable regulations, guidelines, standards and/or best practices for such work.
  - .2 Waste transportation to be conducted in accordance with the Federal Transportation of Dangerous Goods Regulation.
  - .3 Dispose of waste at a licensed facility.
- .2 Supervision
  - .1 One Supervisor for every ten workers is required.
  - .2 Supervisor must remain within work area during mercury abatement activities.
- .3 Preparation
  - .1 Remove and store items to be salvaged or reused.
    - .1 Protect and wrap items and transport and store in area specified by Departmental Representative.
  - .2 Do not start work until:
    - .1 Arrangements have been made for disposal of waste and the Departmental Representative has been notified.
    - .2 Tools, equipment, and material waste containers are on site.
    - .3 Arrangements have been made for building security.
    - .4 Notifications have been completed and preparatory steps have been taken.
  - .3 Work Area:
    - .1 Isolate areas of high impact to prevent mercury contamination of areas of low concentration as identified in the SOW by sealing off openings with polyethylene sheeting and seal with tape.
    - .2 Maintain emergency fire exits or establish alternatives satisfactory to Authority having jurisdiction.
    - .3 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA

Standard. Ensure safe installation of electrical cables and equipment.

.4 Mercury Abatement

- .1 Vacuum walls, floors, ceilings and other surfaces (e.g. stairs, windowsills, etc.) as indicated in the SOW with a mercury recovery vacuum system to adsorb mercury vapours; starting on top floor and working down to bottom floor.
  - .1 Collect residual mercury and place in appropriately labelled waste container.
- .2 Wet wipe all surfaces using a Mercon X Mercury Decontaminant and Mercury Vapor Suppressant.
  - .1 Wet wipes to be collected and treated as mercury waste, and placed in appropriately labelled waste containers.
- .3 Complete lead-based paint abatement procedures and interior painting.
- .4 Provisions shall be made for the application of a fast-dry lacquer (with grit) to surfaces (floors, walls and window sills) as indicated in the SOW consisting of porous building materials (concrete and wood) on the interior of the lightstation, to seal residual mercury to the surface if mercury abatement cleaning activities are not successful. The decision to apply the lacquer (with grit) will be made by the Departmental Representative and will include a test patch of the lacquer (with grit) on selected surfaces to determine adherence to material specifications.

.5 Inspection

- .1 Following the mercury abatement (or each phase of mercury abatement), provisions shall be made to heat the ambient temperature inside the enclosure(s) to a minimum of 25 degrees Celsius prior to, and throughout the post remediation mercury vapour monitoring.
- .2 Post remediation mercury monitoring to be coordinated by Departmental Representative (e.g. independent party). Mercury vapour levels following successful abatement must be less than 0.003 mg/m<sup>3</sup>.
- .3 Departmental Representative will confirm work for:
  - .1 Adherence to specific procedures and materials.
  - .2 Final cleanliness and completion.
  - .3 If mercury vapour levels exceed 0.003 mg/m<sup>3</sup>, contractor to redo mercury abatement activities until desired readings are obtained.
  - .4 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level to meet target of 0.003 mg/m<sup>3</sup>.

.6 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.

- .2 Waste Management: separate waste materials for reuse, recycling or disposal.
- .3 Collect hazardous waste materials (e.g. vacuumed mercury droplets, wet wipes, disposable clothing, etc.) in accordance with applicable federal and provincial acts, regulations, and guidelines in appropriate, labeled containers.

### **3.2 FINAL CLEANUP**

- .1 Following Departmental Representative approval, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area.
- .3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport as mercury waste.
- .4 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.
- .5 Dispose of hazardous waste materials (e.g. vacuumed mercury droplets, wet wipes, disposable clothing, etc.) in accordance with applicable federal and provincial acts, regulations, and guidelines.
- .6 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
- .7 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
- .8 Provide waste manifests and proof of disposal to Departmental Representative.
- .9 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
- .10 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
- .11 Dispose of hazardous wastes in timely fashion in accordance with applicable federal and provincial regulations.
- .12 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

**END OF SECTION**

**Part 1 General**

**1.1 SUMMARY**

- .1 Comply with requirements of this Section when performing Type-1 operations as defined in Public Works and Government Services Canada (PWGSC) Deputy Minister Directive (DIR:057) *Respecting Asbestos Management in Federal Owned or Leased Buildings or Facilities containing Asbestos*.
- .2 Locations, quantities and types of asbestos containing materials to be removed in accordance to this Type 1 specification are provided in the Statement of Work (SOW).

**1.2 RELATED REQUIREMENTS**

- .1 Section 01 35 29.06 - Health and Safety Requirements.

**1.3 REFERENCES**

- .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 Prince Edward Island Occupational Health and Safety Act.
  - .1 PEI Reg. Part 49 - Asbestos Regulations
- .4 PWGSC Deputy Minister Directive (DIR:057) *Respecting Asbestos Management in Federal Owned or Leased Buildings or Facilities containing Asbestos*.
  - .1 Appendix 5 - Classification of Asbestos-Related Work
  - .2 Appendix 6 - Work Procedures
- .5 Statement of Work to be provided on a site specific basis.

**1.4 DEFINITIONS**

- .1 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 direction at 99.97% efficiency.
- .2 Amended Water: water with nonionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): materials that contain 1.0 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.

- .5 Authorized Visitors: Public Works and Government Services Canada (PWGSC), Environmental Consultant, representatives of regulatory agencies and any visitor approved by PWGSC.
- .6 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 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.
- .7 Friable material: means material that:
  - .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
  - .2 is crumbled, pulverized or powdered.
- .8 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area: any area of the building or work site that is outside Asbestos Work Area.
- .10 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.
- .11 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.

**1.5 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 to Departmental Representative that all asbestos workers and/or supervisor have received appropriate training (in accordance with Provincial Regulations) and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.

- .6 Submit Worker's Compensation Board status and transcription of insurance.
- .7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

**1.6 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 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .2 Safety Requirements: worker 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-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Prince Edward Island Occupational Health & Safety Act (part 49.15). 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, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts 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 the seal between respirator and face.

**1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal. Place paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with on-site practises.
- .3 Separate for reuse and recycling and place in designated containers in accordance with on-site practises.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .6 Fold up metal banding, flatten and place in designated area for recycling.
- .7 Disposal of asbestos waste generated by removal activities must comply with Provincial Regulations (OSHA Part 49). Dispose of asbestos waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels.
- .8 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

**1.8 EXISTING CONDITIONS**

- .1 Concentrations of asbestos-containing materials have been identified. Refer to Statement of Work for inventory of ACMs.
- .2 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are outlined in **Section 1.3 References** and are provided in the Statement of Work.
- .3 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or reports pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

**1.9 SCHEDULING**

- .1 Hours of Work: perform work during normal working hours unless otherwise specified in Statement of Work.

**1.10 PERSONNEL TRAINING**

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, 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, following minimum requirements:
  - .1 Proper 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 a competent, qualified person.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Drop 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 mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate containers.
  - .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.

- .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 pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.
- .4 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.
- .5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

### **Part 3 Execution**

#### **3.1 PROCEDURES**

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.
  - .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.
  - .2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
  - .3 Do not use compressed air to clean up or remove dust from any surface.
- .3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
  - .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.
- .4 Ensure proper equipment is on site to perform the removal of non-friable asbestos containing materials.
- .5 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.
  - .1 Use garden reservoir type low - velocity fine - mist sprayer.
  - .2 Perform Work to reduce dust creation to lowest levels practicable.
  - .3 Work will be subject to visual inspection and air monitoring.

- .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .6 Frequently and at regular intervals during 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.
- .7 Cleanup:
  - .1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.
  - .2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.
  - .3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Province of Prince Edward Island. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.
  - .4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

END OF SECTION

**Part 1 General**

**1.1 SUMMARY**

- .1 Comply with requirements of this Section when performing Type-2 operations as defined in Public Works and Government Services Canada (PWGSC) Deputy Minister Directive (DIR:057) *Respecting Asbestos Management in Federal Owned or Leased Buildings or Facilities containing Asbestos*.
- .2 Locations, quantities and types of asbestos containing materials to be removed in accordance to this Type 2 specification are provided in the Statement of Work (SOW).

**1.2 RELATED REQUIREMENTS**

- .1 Section 01 35 29.06 - Health and Safety Requirements.

**1.3 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.205-[94], Sealer for Application of Asbestos Fibre Releasing Materials.
- .2 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .5 Underwriters' Laboratories of Canada (ULC)
- .6 Prince Edward Island Occupational Health and Safety Act.
  - .1 PEI Reg. Part 49 - Asbestos Regulations
- .7 PWGSC Deputy Minister Directive (DIR:057) *Respecting Asbestos Management in Federal Owned or Leased Buildings or Facilities containing Asbestos*.
  - .1 Appendix 5 - Classification of Asbestos-Related Work
  - .2 Appendix 6 - Work Procedures
- .8 Statement of Work to be provided on a site specific basis.

**1.4 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 1.0 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: Public Works and Government Services Canada (PWGSC), Environmental Consultant, representatives of regulatory agencies and any visitor approved by PWGSC.
- .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 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 Materials: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .7 Glove Bag: prefabricated glove bag as follows:
  - .1 Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.
  - .2 Integral 0.25 mm (10 mil) 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 Statement of Work.

**1.5 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 to Departmental Representative that all asbestos workers and/or supervisor have received appropriate training (in accordance with Provincial Regulations) and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices 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 asbestos abatement course, of not less than two days duration, 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 Material Safety Data Sheets (MSDS) for chemicals or materials including:
  - .1 Encapsulants;
  - .2 Amended water;
  - .3 Slow drying sealer.
- .9 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

#### **1.6 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 the time work is performed.
- .2 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .2 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-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Prince Edward Island Occupational Health & Safety Act (part 49.15). 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 is to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator is to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, is to be stored in a convenient, clean and sanitary location. The employer is to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures is to be provided to and reviewed with each worker who is required to wear a respirator. A worker is 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 to 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. It includes suitable footwear, and it to be repaired or replaced if torn.
- .3 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .4 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.
- .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 the 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 into and exiting from Asbestos Work Area.

#### 1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal. Place paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with on-site practises.
- .3 Separate for reuse and recycling and place in designated containers in accordance with on-site practises.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .6 Fold up metal banding, flatten and place in designated area for recycling.
- .7 Disposal of asbestos waste generated by removal activities must comply with Provincial Regulations (OSHA Part 49). Dispose of asbestos waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels.
- .8 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

#### 1.8 EXISTING CONDITIONS

- .1 Concentrations of asbestos-containing materials have been identified. Refer to Statement of Work for inventory of ACMs.
- .2 Reports and information pertaining to ACMS to be handled, removed, or otherwise disturbed and disposed of during this project are outlined in **Section 1.3 References** and are provided in the Statement of Work.
- .3 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or reports pertaining to Work. Do not disturb such material pending instructions by Departmental Representative.

**1.9 SCHEDULING**

- .1 Hours of Work: perform work during normal working hours unless otherwise specified in the Statement of Work.

**1.10 PERSONNEL TRAINING**

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, in use of glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, at minimum:
  - .1 Proper 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 a competent, qualified person.

**Part 2 Products**

**2.1 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 mixed with water in concentration to provide thorough 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 Labeling 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: safe-T-Strip products in configuration suitable for Work, or Alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.

- .2 The glove bag is 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.
  - .1 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.

### **Part 3 Execution**

#### **3.1 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.

#### **3.2 PROCEDURES**

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .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) '.
- .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 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.
- .4 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
  - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in work areas where dust or contamination cannot otherwise be safely contained.
  - .2 When removing asbestos containing gasket from furnace or blanket from chimney, erect enclosure of polyethylene sheeting around work area, shut off mechanical ventilation system serving work area and seal ventilation ducts to and from work area. Use "GloveBag" method if it's possible to maintain a proper seal around materials to be removed.
- .5 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.
- .6 Removal Using Glove Bag:
  - .1 A glove bag is not to be used to remove gasket from furnace or blanket from chimney if:
    - .1 It may not be possible to maintain a proper seal for any reason including, without limitation:
      - .1 The condition of the asbestos containing material.
      - .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 furnace piping (gasket removal) or chimney opening

(blanket removal) and close zippers. Seal bag to furnace or chimney with cloth straps.

- .4 Place hands in gloves and use necessary tools to remove gasket or blanket. Arrange asbestos-containing materials in bag to obtain full capacity of bag.
- .5 Insert nozzle of garden reservoir type sprayer into bag through valve and wash down furnace (or chimney) and interior of bag thoroughly. Wet surface of asbestos containing material 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. 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 furnace piping or chimney surface 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 furnace or area on chimney with slow drying sealer to seal in any residual fibres.
- .7 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.
- .8 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 and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial regulations. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that 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.

### **3.3 AIR MONITORING**

- .1 Following completion of cleaning operations, PWGSC may decide to take air samples within former Asbestos Work Areas in accordance with Provincial Occupational Health and Safety Regulations. A third party

consultant may be commissioned by PWGSC to perform environmental oversight during abatement activities and to conduct air monitoring and testing.

- .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial Occupational Health and Safety Regulations.
- .2 If air monitoring shows that areas outside Asbestos Work Area enclosures 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, Departmental Representative to measure fibre content of air outside Work areas by means of air samples analyzed by Phase Contrast Microscopy (PCM).
  - .1 Stop Work when PCM measurements exceed 0.05 f/cc and correct procedures.

**END OF SECTION**

**Part 1 General**

**1.1 SUMMARY**

- .1 Comply with requirements of this Section when performing Type-3 operations as defined in Public Works and Government Services Canada (PWGSC) Deputy Minister Directive (DIR:057) *Respecting Asbestos Management in Federal Owned or Leased Buildings or Facilities containing Asbestos.*
- .2 Locations, quantities and types of asbestos containing materials to be removed in accordance to this Type 3 specification are provided in the Statement of Work (SOW).

**1.2 RELATED REQUIREMENTS**

- .1 Section 01 35 29.06 - Health and Safety Requirements.

**1.3 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.205-94, Sealer for Application to Asbestos-Fibre-Releasing Materials.
- .2 Canadian Standards Association (CSA International)
- .3 Department of Justice Canada
  - .1 Canadian Environmental Protection Act (CEPA), 1999.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 Underwriters' Laboratories of Canada (ULC)
- .7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention (CDC)/National Institute for Occupational Safety and Health (NIOSH)
  - .1 NIOSH 94-113-August 1994, NIOSH Manual of Analytical Methods (NMAM), 4th Edition.
- .8 U.S. Department of Labour - Occupational Safety and Health Administration - Toxic and Hazardous Substances
  - .1 29 CFR 1910.1001-2001, Asbestos Regulations.
- .9 Prince Edward Island Occupational Health and Safety Act.
  - .1 PEI Reg. Part 49 - Asbestos Regulations

- .10 PWGSC Deputy Minister Directive (DIR:057) *Respecting Asbestos Management in Federal Owned or Leased Buildings or Facilities containing Asbestos.*
  - .1 Appendix 5 - Classification of Asbestos-Related Work
  - .2 Appendix 6 - Work Procedures
- .11 Statement of Work - To be provided on a site specific basis.

**1.4 DEFINITIONS**

- .1 Airlock: system for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.
- .2 Amended Water: water with a non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .3 Asbestos Containing Materials (ACMs): materials that contain 1.0 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Areas: area where work takes place which will, or may disturb ACMs.
- .5 Authorized Visitors: Public Works and Government Services Canada (PWGSC), Environmental Consultant, representatives of regulatory agencies and any visitor approved by PWGSC.
- .6 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 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.
- .7 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
  - .1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.
  - .2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.
  - .3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.
- .8 DOP Test: testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.

- .9 Friable Materials: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .10 Glove Bag: prefabricated glove bag as follows:
  - .1 Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.
  - .2 Integral 0.25 mm (10 mil) 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.
- .11 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .12 Negative pressure: system that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.
  - .1 System to maintain minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.
- .13 Non-Friable Materials: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .14 Occupied Areas: any area of building or work site that is outside Asbestos Work Area.
- .15 Polyethylene sheeting sealed with tape: polyethylene sheeting of type and thickness specified sealed with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of asbestos fibres through sheeting into clean area.
- .16 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for Statement of Work.

**1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Before beginning work:
  - .1 Obtain from appropriate agency and submit to Departmental Representative necessary permits for transportation and disposal of asbestos waste. Ensure that dump operator is fully aware of hazardous nature of material being dumped, and proper methods of disposal. Submit proof satisfactory to Departmental

- Representative that suitable arrangements have been made to receive and properly dispose of asbestos waste.
- .2 Submit proof satisfactory to Departmental Representative that all asbestos workers have received appropriate training and education by a competent person on 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. Submit proof of attendance in form of certificate.
  - .3 Ensure supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by Departmental Representative. Submit proof of attendance in form of certificate. Minimum of one Supervisor for every ten workers.
  - .4 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.
  - .5 Submit documentation including test results for sealer proposed for use.
  - .6 Submit Provincial requirements for Notice of Project form.
  - .7 Submit proof of Contractor's Asbestos Liability Insurance.
  - .8 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.
  - .9 Submit Worker's Compensation Board status and transcription of insurance.
  - .10 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including but not limited to following:
    - .1 Encapsulants.
    - .2 Amended water.
    - .3 Slow drying sealer.

## **1.6 QUALITY ASSURANCE**

- .1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .2 Safety Requirements: worker and visitor protection.
    - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area includes:

- .1 Air purifying full face-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Prince Edward Island Occupational Health & Safety Act (part 49.15). The respirator is 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 is to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator is to have damaged or deteriorated parts 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 is 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 to 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. It includes suitable footwear, and it to be repaired or replaced if torn. Requirements for each worker:
  - .1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters that have been tested as satisfactory, clean coveralls and head covers before entering Equipment and Access Rooms or Asbestos Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.
  - .2 Remove gross contamination from clothing before leaving work area then proceed to Equipment and Access Room and remove clothing except respirators. Place contaminated work suits in receptacles for disposal with other asbestos - contaminated materials. Leave reusable items

except respirator in Equipment and Access Room. Still wearing the respirator proceed naked to showers. Using soap and water wash body and hair thoroughly. Clean outside of respirator with soap and water while showering; remove respirator; remove filters and wet them and dispose of filters in container provided for purpose; and wash and rinse inside of respirator. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.

- .3 After showering and drying off, proceed to clean change room and dress in street clothes at end of each day's work, or in clean coveralls before eating, smoking, or drinking. If re-entering work area, follow procedures outlined in paragraphs above.
- .4 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers must not use this system as means to leave or enter work area.
- .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .3 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual asbestos abatement.
- .4 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.
- .5 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects the seal between respirator and face.
- .6 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 into and exiting from Asbestos Work Area.

**1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal. Place paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with on-site practises.
- .3 Separate for reuse and recycling and place in designated containers in accordance with on-site practises.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .6 Fold up metal banding, flatten and place in designated area for recycling.
- .7 Disposal of asbestos waste generated by removal activities must comply with Provincial Regulations (OSHA Part 49). Dispose of asbestos waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels.
- .8 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

**1.8 EXISTING CONDITIONS**

- .1 Concentrations of asbestos-containing materials have been identified. Refer to Statement of Work for inventory of ACMs.
- .2 Results of tests of asbestos containing materials to be handled, removed, or otherwise disturbed and disposed of during this Project are outlined in **Section 1.3 References** and are provided in the Statement of Work. These are for general information only and are not necessarily representative of asbestos containing materials covered within the scope of this Project.
- .3 Notify Departmental Representative of suspect asbestos containing material discovered during Work and not apparent from drawings, specifications, or reports pertaining to Work. Do not disturb such material until pending instructions by Departmental Representative.

**1.9 SCHEDULING**

- .1 Not later than ten days before beginning Work on this Project notify following in writing:
  - .1 Workers Compensation Board of Prince Edward Island.
  - .2 Disposal Authorities.
- .2 Inform sub-trades of presence of asbestos containing materials identified in Existing Conditions.

- .3 Submit to Departmental Representative copy of notifications prior to start of Work.
- .4 Hours of Work: perform work during normal working hours unless otherwise specified in SOW.

**1.10 PERSONNEL TRAINING**

- .1 Before beginning Work, provide to Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene including dress and showers, in entry and exit from Asbestos Work Area, in aspects of work procedures including glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, at minimum:
  - .1 Proper 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.
- .4 Supervisory personnel to complete required training.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Polyethylene: minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .4 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by Departmental Representative, mixed with water in concentration to provide adequate penetration and wetting of asbestos containing material.
- .5 Waste Containers: contain waste in two separate containers.
  - .1 Inner container: 0.15 mm thick sealable polyethylene bag
  - .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. Label containers in accordance with Provincial Asbestos Regulations [OSHA Part 49]. Label in both official languages.
- .6 Glove bag:
  - .1 Acceptable materials: safe-T-Strip products 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.
- .7 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .8 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.
- .9 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.
- .10 Encapsulants: Type Class A water based conforming to CAN/CGSB-1.205.

### **Part 3 Execution**

#### **3.1 PREPARATION**

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Work Areas:
  - .1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.

- .2 Pre-clean moveable furniture and carpeting within proposed work area using HEPA vacuum and remove from work areas and dispose of.
- .3 Pre-clean fixed casework, plant, and equipment within proposed work area, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
- .4 Clean proposed work area using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.
- .5 The spread of dust from the work area is to be prevented by:
  - .1 Using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls.
  - .2 Using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.
- .6 Put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. Provide continuous monitoring of pressure difference using automatic recording instrument. The system to maintain a negative air pressure of 0.02 inches (5 Pa) of water, relative to the area outside the enclosed area. The system is to be inspected and maintained by a competent person prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it's to be replaced before the ventilation system is used.
- .7 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
- .8 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.
- .9 Build airlocks at entrances to and exits from work area so that work area is always closed off by one curtained doorway when workers enter or exit.
- .10 At each access to work areas 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)".
- .11 After work area isolation, remove heating, ventilating, and air conditioning filters, pack in sealed plastic bags 0.15 mm minimum

thick, and treat as contaminated asbestos waste. Remove ceiling - mounted objects such as lights, partitions, other fixtures not previously sealed off, and other objects that interfere with asbestos removal, as directed by Departmental Representative. Use localized water spraying during fixture removal to reduce fibre dispersal.

- .12 Maintain emergency and fire exits from work area, or establish alternative exits satisfactory to Authority having jurisdiction.
  - .13 Where application of water is required for wetting asbestos containing materials, shut off electrical power, provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.
  - .14 After preparation of work area and Decontamination Enclosure Systems, remove plaster ceilings, including lath, furring, channels, hangers, wires, clips, and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.
  - .15 After preparation of work area and Decontamination Enclosure Systems, remove asbestos containing materials within work area and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.
- .3 Worker Decontamination Enclosure System:
- .1 Worker Decontamination Enclosure System includes Equipment and Access Room, Shower Room, and Clean Room, as follows:
    - .1 Equipment and Access Room: build Equipment and Access Room between Shower Room and work area, with two curtained doorways, one to Shower Room and one to work area. Install portable toilet, waste receptor, and storage facilities for workers' shoes and protective clothing to be re-worn in work area. Build Equipment and Access Room large enough to accommodate specified facilities, other equipment needed, and at least one worker; allowing him /her sufficient space to undress comfortably.
    - .2 Shower Room: build Shower Room between Clean Room and Equipment and Access Room, with two curtained doorways, one to Clean Room and one to Equipment and Access Room. Provide one shower for every five workers. Provide constant supply of hot and cold or warm water. Cold and hot water sources availability to be confirmed by Departmental Representative prior to start of work. Drainage pathways also to be confirmed by Departmental Representative prior to start of work. Provide piping and connect to water sources and drains. Pump waste water through 5 micrometre filter system

acceptable to Departmental Representative before directing into drains. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.

- .3 Clean Room: build Clean Room between Shower Room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to Shower Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
- .4 Container and Equipment Decontamination Enclosure System:
  - .1 Container and Equipment Decontamination Enclosure System consists of Staging Area within work area, Washroom, Holding Room, and Unloading Room. Purpose of system is to provide means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which Worker Decontamination Enclosure System is not suitable.
    - .1 Staging Area: designate Staging Area in work area for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal to Washroom. Equip Staging Area with curtained doorway to Washroom.
    - .2 Washroom: build Washroom between Staging Area and Holding Room with two curtained doorways, one to Staging Area and one to Holding Room. Provide high - pressure low - volume sprays for washing of waste containers and equipment. Pump waste water through 5 micrometre filter system before directing into drains. Provide piping and connect to water sources and drains.
    - .3 Holding Room: build Holding Room between Washroom and Unloading Room, with two curtained doorways, one to Washroom and one to Unloading Room. Build Holding Room sized to accommodate at least two waste containers and largest item of equipment used.
    - .4 Unloading Room: build Unloading Room between Holding Room and outside, with two curtained doorways, one to Holding Room and one to outside.
- .5 Construction of Decontamination Enclosures:
  - .1 Build suitable framing for enclosures or use existing rooms, where convenient, and line with polyethylene sheeting sealed with tape.
  - .2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved

through doorway, one of two closures comprising doorway always remains closed.

.6 Separation of Work Areas from Occupied Areas:

.1 Separate parts of building required to remain in use (if necessary), from parts of building used for asbestos abatement by means of airtight barrier system constructed as follows:

.1 Build suitable floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting sealed with tape, and apply 9 mm minimum thick plywood. Seal joints between plywood sheets and between plywood and adjacent materials with surface film forming type sealer, to create airtight barrier.

.2 Cover plywood barrier with polyethylene sealed with tape, as specified for work areas.

.7 Maintenance of Enclosures:

.1 Maintain enclosures in tidy condition.

.2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Visually inspect enclosures at beginning of each working period.

.4 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative.

.8 Do not begin Asbestos Abatement work until:

.1 Arrangements have been made for disposal of waste.

.2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.

.3 Work area and decontamination enclosures are effectively segregated.

.4 Tools, equipment, and materials waste containers are on hand.

.5 Arrangements have been made for building security.

.6 Warning signs are displayed where access to contaminated areas is possible.

.7 Notifications have been completed and other preparatory steps have been taken.

**3.2 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.

**3.3 ASBESTOS REMOVAL**

.1 Before removing asbestos:

- .1 Prepare site.
- .2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.
- .2 Remove saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure that containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brush and wet sponge surfaces from which asbestos has been removed, to remove visible material. During this work keep surfaces wet.
- .5 Where Departmental Representative decides complete removal of asbestos containing material is impossible, due to obstructions such as structural members or major service elements, and provides written direction, encapsulate material as follows:
  - .1 Apply surface film forming type sealer to provide 0.635 mm minimum dry film thickness over sprayed asbestos surfaces. Apply using airless spray equipment to avoid blowing off fibres.
- .6 After wire brushing and wet sponging to remove visible asbestos, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24 hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24 hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Departmental Representative or Consultant, apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.
- .7 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.
- .8 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, 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 and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial regulations. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that 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.

### **3.4 FINAL CLEANUP**

- .1 Following cleaning specified above, and when air sampling shows that asbestos levels on both sides of seals do not exceed 0.05 fibres/cc, as determined by membrane filter method at 400-500X magnification phase contrast illumination, as described in NIOSH Method 94-113 or equivalent, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible asbestos containing particles observed during cleanup, immediately, using HEPA vacuum equipment.
- .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Include in clean-up Work areas, Equipment and Access Room, Washroom, Shower Room, and other contaminated enclosures.
- .5 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure that no dust or debris remains on surfaces as a result of dismantling operations and carry out air monitoring again to ensure that asbestos levels in building do not exceed 0.05 fibres/cc. Repeat cleaning using HEPA vacuum equipment, or wet cleaning methods where feasible, in conjunction with sampling until levels meet this criteria.
- .7 As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of to authorized disposal area in

accordance with requirements of disposal authority. Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative to ensure that dumping is done in accordance with governing regulations.

### **3.5 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS**

- .1 When cleanup is complete:
  - .1 Re-establish objects and furniture moved to temporary locations in course of Work, in their proper positions.
  - .2 Re-secure mounted objects removed in course of Work in their former positions.
  - .3 Re-establish mechanical and electrical systems in proper working order. Install new filters.
  - .4 Repair or replace objects damaged in the course of Work, as directed by Departmental Representative.

### **3.6 AIR MONITORING**

- .1 From beginning of Work until completion of cleaning operations, a third party consultant (Environmental Consultant) on behalf of the Departmental Representative, may take air samples on daily basis outside of work area enclosure in accordance with Health Canada recommendations.
  - .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial Occupational Health and Safety Regulation (PEI - OSHA Part 49).
- .2 Use results of air monitoring inside work area to establish type of respirators to be used. Workers may be required to wear sample pumps for up to full-shift periods.
  - .1 If fibre levels are above safety factor of respirators in use, stop abatement, apply means of dust suppression, and use higher safety factor in respiratory protection for persons inside enclosure.
  - .2 If air monitoring shows that areas outside work area enclosures are contaminated, enclose, maintain and clean these areas, in same manner as that applicable to work areas.
- .3 During course of Work, a third party consultant (Environmental Consultant) on behalf of the Departmental Representative, may measure fibre content of air outside work areas by means air samples analyzed by Phase Contrast Microscopy (PCM).
  - .1 Stop Work when PCM measurements exceed 0.05 f/cc and correct procedures.
- .4 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, a third party consultant (Environmental Consultant) on behalf of the Departmental Representative, will perform air monitoring within Asbestos Work Area.

- .1 Final air monitoring results must show fibre levels of less than 0.05 f/cc.
- .2 If air monitoring results show fibre levels in excess of 0.05 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 0.05 f/cc.

### **3.7 INSPECTION**

- .1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviations from these requirements that have not been approved in writing by Departmental Representative, may result in Work stoppage, at no cost to Owner.
- .2 Departmental Representative or the Consultant (on behalf of the Departmental Representative) will inspect Work for:
  - .1 Adherence to specific procedures and materials.
  - .2 Final cleanliness and completion.
  - .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .3 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur Departmental Representative or the Consultant (on behalf of the Departmental Representative) may order Work shutdown.
  - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

**END OF SECTION**







1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal and Provincial requirements pertaining to lead paint, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .2 Safety Requirements: worker and visitor protection.
    - .1 Protective equipment and clothing to be worn by workers and visitors in work Area include:
      - .1 Respirator NIOSH approved and equipped with replaceable HEPA filter cartridges with an assigned protection factor of 50, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure. Provide sufficient amount of filters.
      - .2 Half mask respirator: half-mask particulate respirator with P - series filter, and 99.97 % efficiency could be provided.
    - .2 Eating, drinking, chewing, and smoking are not permitted in work area.
    - .3 Ensure workers wash hands and face when leaving work area.
    - .4 Visitor Protection:
      - .1 Provide approved respirators to Authorized Visitors to work areas.
      - .2 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .2 Disposal of lead containing paint and lead leachate toxic waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Where applicable, dispose of lead leachate toxic waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels. A summary of lead waste and subsequent disposal requirements are provided in the Statement of Work.
- .3 Provide manifests describing and listing waste created. Transport containers by approved means to licensed out of province disposal site (if applicable - See Statement of Work).

**1.8 EXISTING CONDITIONS**

- .1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are outlined in the Statement of Work.
- .2 Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or reports pertaining to Statement of Work. Do not disturb such material until instructed by Departmental Representative.

**1.9 SCHEDULING**

- .1 Not later than ten days before beginning Work on this Project notify following in writing:
  - .1 Workers Compensation Board of Prince Edward Island.
  - .2 Disposal Authorities.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Departmental Representative copy of notifications prior to start of Work.
- .4 Hours of Work: perform work during normal working hours unless otherwise specified in the Statement of Work.

**1.10 PERSONNEL TRAINING**

- .1 Provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene, in aspects of work procedures, and in use, cleaning, and disposal of respirators.
- .2 Instruction and training related to respirators includes, at minimum:
  - .1 Proper 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.
- .4 Supervisory personnel to complete required training.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Polyethylene 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: 0.15 mm woven fibre reinforced fabric bonded both sides with polyethylene.





- .3 Building materials to be disposed of at a C&D facility may require a visual assessment prior to disposal.

**END OF SECTION**