

## **PART 1 GENERAL**

### **1.1 General and Related Work**

- .1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the Contract.
- .2 Related work specified elsewhere:
  - .1 Section 02 82 00.02 Asbestos Abatement – Type 2 Procedures
  - .2 Section 02 82 00.03 Asbestos Abatement – Type 3 Procedures
- .3 Conditions identifies all known hazardous building materials within the Project Area. The information provided is for general reference only. Each Contractor must confirm existing conditions on site prior to tender close.
  - .1 The specification fulfils the requirements of Section 30 of the Ontario Occupational Health and Safety Act.
  - .2 The specification fulfils the requirements of the Section 10 of Ontario Regulation 278/05.
- .4 The Outline of Work identifies the location, condition and quantities of hazardous building materials to be removed as part of this project.
  - .1 It is the intent that work prescribed this Section will result in the removal of all hazardous materials as outlined and the decontamination of all surfaces or materials which may have been or become contaminated by hazardous materials either during or prior to work of this Contract.

### **1.2 Site Conditions**

- .1 Refer to the report entitled “Hazardous Building Materials Assessment, 5th & 6th Flr City Hall Burlington COB Nov 16, 2023”, prepared by Pinchin, file number 320587.008.
- .2 Refer to the report entitled “Asbestos and Lead Testing Results”, Burlington City Hall COB dated May 30, 2024, prepared by Pinchin, file number 320587.008.
- .3 Additional clarification regarding site conditions included the following:
  - .1 All plaster where present in the Washrooms on the 5<sup>th</sup> and 6<sup>th</sup> Floors (Rooms 514, 515, 612 and 613) is asbestos-containing. Full plaster walls or residual plaster overspray is presumed to be present behind ceramic tiles on walls.
  - .2 Plaster wall finish (fountain/ elevator door wall) in the Lobby (Rooms 501 and 601) is non-asbestos, refer to the Asbestos and Lead Testing Results report dated May 30, 2024)
  - .3 All other plaster, where not sampled, is presumed to contain asbestos.

- .4 Approximate quantities and locations of asbestos-containing materials are provided in the report, it is the contractor's responsibility to confirm all quantities and locations provided and to verify all site conditions. No extras for variations in quantities/locations will be accepted.

### 1.3 Outline of Work

- .1 Coordinate the following items with the Owner's Project Manager and the Construction Manager, including but not limited to: electrical isolations, GFI connection, water connections, HVAC and exhaust ventilation system isolation, bin placement, schedule, disconnects, etc.
- .2 Using Type 2 asbestos procedures prescribed in the Section identified in Related Work, remove all surface mounted item attached to walls and or ceilings, including but not limited to ceiling grid, electrical, plumbing, fixtures, accessories, partitions, etc. Use power tools equipped with a HEPA dust collection device.
- .1 Remove and turn over to Owner items specified, including but not limited to: mirrors, soap/toilet paper/paper towel dispenser etc.
- .3 Using Type 3 asbestos procedures prescribed in the Sections identified in Related Work, remove and dispose of the following from the Washrooms on the 5<sup>th</sup> and 6<sup>th</sup> floors (Rooms 514, 515, 612 and 613):
- .1 All ceilings (plaster, ceiling tiles, grid, etc.).
- .1 Remove all plaster and or overspray.
- .2 All pipe insulation. Following abatement work, reinsulate all pipes from which pipe insulation has been removed, using fibreglass and PVC jacketing.
- .3 Doors and door frames schedule for removal.
- .4 All ceramic tiles and thin-set from all walls. Include to remove any residual plaster overspray present on walls.
- .5 Carpet and flooring mastic at doorways where doors are scheduled for demolition.
- .6 All plaster walls including both layers (finish and base coat) and any overspray where present.
- .4 Remove and recycle mercury lamps where scheduled for removal.
- .5 Remove and dispose of light ballasts where scheduled for removal. Identify ballasts as either non-PCB or PCB-containing.
- .1 All ballasts not clearly labelled as "NO PCB" are to be treated as PCB containing.
- .2 Non-PCB ballasts to be recycled or disposed as solid non-hazardous waste.
- .3 Transport packaged PCB waste to a Ministry of the Environment approved incineration facility and destroy.

- .6 Follow lead procedures as outlined in the EACC Lead Guideline when disturbing lead-containing materials.
- .7 Follow silica procedures as outlined in the MOL Silica Guidelines when disturbing silica-containing materials including but not limited to demolition of concrete/CMU, grinding of flooring, drilling into concrete, etc..
- .8 Refer to Specification Sections identified in the Related Work for specified personnel protective measures for the safe handling, removal, clean-up, enclosure, or repair of hazardous materials in each phase or work area.
- .9 Visit the site prior to tender close to confirm the location and extent of any hazardous building materials or materials contaminated by hazardous materials.
- .10 Protect surfaces, building fabrics and items remaining within the Abatement Work Area.
- .11 Without disturbing hazardous materials, perform removals where required, prior to abatement work.
  - .1 Maximize waste diversion by use of resale of building materials, or recycling.
- .12 Isolate the Abatement Work Area from adjoining Occupied and Non-Occupied Areas whether present at an interior or exterior location.
- .13 Maintain emergency and fire exits from Abatement Work Area, or establish alternative exits satisfactory to Provincial Fire Marshall and local authorities having jurisdiction. Maintain extra routes from occupied areas. Place emergency exit signs at locations to clearly mark exit route. Seal emergency exit doors so as not to impede use of door during emergency evacuation.
- .14 Remove, clean, store and replace at completion of work, non-operating mechanical and electrical equipment, ducts, building components, materials or items removed to accommodate asbestos removal.
- .15 Remove and dispose of as appropriate waste, building components, materials and items contaminated by hazardous materials that cannot be effectively cleaned.
- .16 Final clean work area to remove visible signs of asbestos and other hazardous materials, other debris or settled dust.
- .17 Apply lock-down agent to exposed surfaces throughout the work area and to surfaces from which any hazardous materials have been removed.
  - .1 Do not apply lock-down to materials which would be damaged by its application.
- .18 Unless otherwise specified, the handling, removal, clean-up or repair of hazardous materials or surfaces contaminated with hazardous materials is to be performed following wet removal techniques.

#### **1.4 Schedule**

- .1 Provide necessary manpower, supervision, equipment and materials to maintain and complete the project on schedule.
- .2 Work Hours:
  - .1 Coordinate all work, scheduling and phasing with the Owner.
  - .2 Duration for which HVAC systems may remain shutdown to accommodate quiet hours work will vary in accordance with outside weather conditions and internal demand. Duration of quiet hours work will have to be scheduled accordingly and in consultation with the Abatement Consultant and Owner.
- .3 Provide 48 hours written notice to the Abatement Consultant of any request to work outside normal working hours. Obtain written approval before proceeding.

## 1.5 Definitions

- .1 Abatement Consultant: Owner's Representative providing inspection and air monitoring.
- .2 Abatement Contractor: Contractor or sub-contractor performing work of this section.
- .3 Abatement Work Area: Area where work takes place which will, or may, disturb hazardous materials.
- .4 Amended Water: Water with wetting agent added for the purpose of reducing surface tension to allow thorough wetting of materials.
- .5 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including: actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.
- .6 Asbestos-Containing Material (ACM): Material identified under Site Conditions including any debris, overspray, fallen material and settled dust.
- .7 Authorized Visitors: Building Owner, Abatement Consultant, or designated representative, and persons representing regulatory agencies.
- .8 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with Regulation 278/05 and the Occupational Health and Safety Act and has knowledge of the potential or actual danger to health and safety in the work.
- .9 Contaminated Waste: Material identified under Site Conditions, including fallen material, settled dust, other debris and materials or equipment deemed to be contaminated by the Abatement Consultant.
- .10 Curtained Doorway: Doorway consisting of two (2) overlapping flaps of rip-proof polyethylene arranged to permit ingress and egress from one room to another while permitting minimal air movement between rooms.

- .11 DOP Test: A testing method used to determine the integrity of the Negative Pressure unit or vacuum using a Dispersed Oil Particulate (DOP) or Poly Alpha Olefin (PAO) HEPA filter leak test. This test is to be conducted on site where units are to be installed. Refer to the Environmental Abatement Council of Canada (EACC) DOP/PAO Testing Guideline 2013 or ANSI/ASME N510-2007.
- .12 Fitting: Individual segments or pieces of a mechanical service line which may include but is not limited to the hangers, tees, elbows, joints, valves, unions, etc.
- .13 Friable Material: Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .14 HEPA: High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.
- .15 Lead-Containing: The Ontario Ministry of Labour (MOL) has not established a lower limit for concentrations of lead in paint, below which precautions do not need to be considered during construction projects. Pinchin follows the recommendations of the Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair. The Guideline suggests that 0.1% (1,000 ppm) lead in paint represents a de minimis concentration of lead in paint for construction hygiene purposes, that is a concentration below which the lead content is not the limiting hazard in any disturbance of leaded paint for non-aggressive disturbance of painted finishes, (hand powered demolition, chipping, scraping, light sanding, etc.).
- .16 Lead Waste: Waste generated from removal of lead-containing materials, or the substrate and paint finish where left intact.
- .17 Mercury Waste: Equipment, materials or items containing mercury or contaminated with mercury.
- .18 Milestone Inspection: Inspection of the Abatement Work Area at a defined point in the abatement operation.
- .19 Negative Pressure: A reduced pressure within the Abatement Work Area (> 0.02 inches of water column) established by extracting air directly from Abatement Work Area and discharging it to exterior of building.
- .20 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .21 Occupied Area: Any area of the building or adjoining space outside the Abatement Work Area.
- .22 Personnel: All Contractor's employees, sub-contractors' employees, supervisors.
- .23 PCBs: Monochlorinated or Polychlorinated Biphenyls (or any mixture of both).

- .24 PCB Material: means solid material containing PCBs at a concentration of more than fifty milligrams per kilogram (mg/kg) or 50 parts per million (ppm), or liquid with greater than 2 mg/kg or ppm.
- .25 PCB Waste: PCB Equipment, PCB Material, PCB Liquids and materials or items contaminated with PCBs.
- .26 PCM: Phase Contrast Microscopy.
- .27 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g. remove and turn over to Owner).
- .28 TEM: Transmission Electron Microscopy.

## 1.6 Regulations and Guidelines

- .1 Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.
- .2 Where regulations are not present, follow accepted industry standards and applicable Guideline documents.
- .3 Regulations and Guidelines include but are not limited to the following:
  - .1 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
  - .2 Ministry of the Environment and Climate Change Regulation for the disposal of waste, including R.R.O. 1990, Reg. 347 as amended.
  - .3 PCB Regulations, SOR 2008-273 and R.R.O. 1990, Reg 362.
  - .4 Regulation 490/09 Designated Substances.
  - .5 Environmental Abatement Council of Canada (EACC), Lead Guideline For Construction, Renovation, Maintenance or Repair, October 2014.
  - .6 Ministry of Labour, Guideline, Silica on Construction Projects, 2011.

## 1.7 Quality Assurance

- .1 Removal and handling of hazardous materials is to be performed by persons trained in the methods, procedures and industry practices for Abatement.
- .2 Ensure work proceeds to schedule, meeting all requirements of this Specification.
- .3 Complete work so that at no time airborne dust, visible debris, or water runoff contaminate areas outside the Abatement Work Area.

- .4 Any contamination of surrounding area (indicated by visual inspection or air monitoring) shall necessitate the clean-up of affected area, and in the same manner applicable to an Abatement Work Area at no cost to the Owner.
- .5 All work involving electrical, mechanical, carpentry, glazing, etc., shall be performed by licensed persons experienced and qualified for the work required.

## **1.8 Supervision**

- .1 Provide on site for each work shift, a Shift Superintendent(s), who has authority regarding all aspects related to manpower, equipment and production.
- .2 Supervisory personnel must hold a recognized certificate proving attendance at an asbestos removal training course (2 day minimum duration) and have performed supervisory functions on at least five (5) other asbestos abatement projects of similar size and complexity.
- .3 At all times during work, the Overall or Shift Superintendent(s) must be on site. Failure to comply with this requirement will result in a stoppage of all work, at no cost to the Owner.
- .4 Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the Owner. Owner reserves the right to request replacement of supervisory personnel without explanation.
- .5 Do not replace supervisory personnel without written approval from the Owner.

## **1.9 Instruction and Training**

- .1 Instruction and training must be provided by a competent person.
- .2 All workers completing Type 1, 2 or 3 asbestos abatement must be trained in compliance with Section 19 of O.Reg. 278/05.
  - .1 For Type 3 asbestos abatement, workers must be trained and certified per Section 20 of O.Reg. 278/05.

## **1.10 Notification**

- .1 Before commencing work, notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site, where required.
- .2 Inform all trades on site of the presence and location of hazardous materials identified in the Contract documents.
- .3 Notify the Owner or Owner's Representative, the Joint Occupational Health and Safety Committee and the Provincial Ministry of Labour, if suspected asbestos-containing materials not identified in the contract documents are discovered during the course of the work. Stop work in these areas immediately.
- .4 Notify Sanitary Landfill site as per O.Reg. 347/90 as amended.

## 1.11 Submittals

- .1 Submit prior to starting work:
  - .1 Provincial Workers' Compensation Board Clearance Certificate.
  - .2 Insurance certificates.
  - .3 Copy of Company Health and Safety Policy and applicable programs.
  - .4 Ministry of Labour Notice of Project form.
  - .5 Copy of Certificate of Approval for disposal of hazardous materials waste and location of landfill.
- .2 Submit the following information regarding personnel prior to starting work:
  - .1 Resumes of the supervisory personnel.
  - .2 Proof in the form of a certificate that supervisory personnel have been certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.
  - .3 Proof in the form of a certificate that workers have been certified under the Ministry of Training, Colleges and Universities course 253W.
  - .4 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal or are certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.
  - .5 Written statement that personnel have had instruction on hazards of exposure to hazardous materials identified within this scope, the use of respirator, protective clothing, worker and waste decontamination procedures, and all aspects of work procedures and protective measures.
  - .6 WHMIS training certificates for all personnel.
  - .7 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.
- .3 Submit the following information regarding HEPA filtered devices prior to construction of enclosure or asbestos abatement:
  - .1 Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old.
  - .2 Performance data on negative air units including DOP tests which must be no more than 3 months old if the unit is vented outdoors or which must be performed on site immediately prior to initial usage and when HEPA filters are changed if the unit is vented indoors.
  - .3 DOP tests to be performed by an independent testing company.
    - .1 DOP testing company is required to submit a detailed technical report of testing protocol, including Introduction, Methodology, Results, Conclusions, and Recommendations, including results of the Air-Aerosol Mixing Uniformity test as per ASME N510-1989 (1995).
    - .2 DOP testing company must also provide calibration certificates from an



independent calibration firm or from the manufacturer of the testing equipment for both the aerosol photometer and the pressure gauge on the aerosol generator dated within 1 calendar year from the on-site testing date.

- .3 DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing.
- .4 Submit the following prior to isolating the work area:
  - .1 Safety Data Sheets for chemicals or material used in the course of the Abatement Project.
- .5 Submit the following upon completion of the work.
  - .1 Manifests, waybills, bills of lading etc. as applicable for each type of waste.

## **1.12 Insurance**

- .1 Maintain a Commercial General Liability Policy with an insurance company acceptable to General Contractor And City of Burlington. The intent of this policy is to hold Pinchin Ltd. and City of Burlington harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Commercial General Liability insurance shall be provided on an “occurrence” basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period.
- .2 Maintain an Automobile or Fleet Policy, and Non-owned Automobile Policy with an insurance company acceptable to General Contractor And City of Burlington. The intent of these policies is to hold General Contractor And City of Burlington harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract.
- .3 Maintain a Pollution Liability Policy (or asbestos/lead liability policy or specific coverage under the CGL for asbestos/lead abatement) with an insurance company acceptable to General Contractor And City of Burlington. The intent of this policy is to hold General Contractor And City of Burlington harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Pollution Liability shall be provided on an “occurrence” basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period. Without limiting the generality of the foregoing, the policy shall insure the operations of abatement and shall not contain any environmental and/or health hazard exclusions relating to remediation operations.
- .4 Forward all certificates to General Contractor And City of Burlington before work is commenced, showing General Contractor And City of Burlington as additional insured as their interest may appear.
- .5 General Contractor And City of Burlington may request a certified true copy of the policies.
- .6 The limits will not be less than:
  - .1 Commercial General Liability \$5,000,000.00

.2	Automobile	\$2,000,000.00
.3	Pollution Policy	\$5,000,000.00

**1.13 Inspection**

- .1 From commencement of work until completion of clean-up operations, the Abatement Consultant is empowered by the Owner to inspect for compliance with the requirements of governing authorities, adherence to specified procedures and materials, and to inspect for final cleanliness and completion.
- .2 The Abatement Consultant is empowered by the Owner to order a shutdown of work when leakage of asbestos from the controlled work area has occurred or is likely to occur.
- .3 Any deviation from the requirements of the Specifications or governing authorities that is not approved in writing may result in a stoppage of work, at no cost to the Owner.
- .4 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to the Owner.
- .5 Inspection and air monitoring performed as a result of Contractor's failure to perform satisfactorily regarding quality, safety, or schedule, shall be back-charged to the Contractor.
- .6 Facilitate inspection and provide access as necessary. Make good work disturbed by inspection and testing at no cost to the Owner.
- .7 Refer to the Sections identified in Related Work for specified milestone inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.
- .8 Provide 24 hours written notice to the Abatement Consultant of any request for scheduling of milestone inspections or transportation of waste through Occupied Areas.
- .9 The following Milestone Inspections may take place, at the Owner's cost:
  - .1 Milestone Inspection - Clean Site Preparation
    - .1 Inspection of preparations and set-up prior to contaminated work in the Abatement Work Area.
  - .2 Milestone Inspection - Contaminated Perimeter Preparation
    - .1 Inspection of Abatement Work Area upon completion of limited demolition or abatement and complete installation of upper seals.
  - .3 Milestone Inspection – Bulk Removal Inspection
    - .1 Inspection during asbestos removal, monitoring removal methods, site deficiencies, performing occupied air monitoring, etc.
  - .4 Milestone Inspection - Visual Clearance
    - .1 Inspection of Abatement Work Area after completion of all abatement, but prior to application of lock-down agents or dismantling of enclosure.

- .5 Milestone Inspection – Clearance Sampling
  - .1 Air monitoring performed following removal of asbestos and application of slow drying sealer to ensure fibre levels inside the Type 3 enclosure(s) are within the acceptable limits. The number of samples to be collected and analysed are based on the requirements of O.Reg. 278/05.
- .6 Milestone Inspection – Dismantling Inspection
  - .1 Inspection of the Abatement Work Area and adjacent areas, following completion of all abatement and required air sampling, but prior to Contractor demobilization from the Site.
- .10 Refer to the Sections identified in Related Work for specified milestone inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.
- .11 Do not proceed with next phase of work until written approval of each milestone is received from the Abatement Consultant.

#### **1.14 Air Monitoring - Asbestos**

- .1 Air monitoring will be performed using Phase Contrast Microscopy (PCM) following the National Institute for Occupational Safety and Health Method 7400.
- .2 Co-operate in the collection of air samples, including providing workers to wear sample pumps for up to full-shift periods. Contractor will be responsible for the cost of testing equipment repairs or resampling resulting from the actions of the Contractor's forces.
- .3 Results of PCM samples at or exceeding 0.05 fibres per cubic centimeter of air (fibre/cc) or greater, outside an Abatement Work Area, will indicate asbestos contamination of these areas. Respond as follows:
  - .1 Suspend work within the adjoining Abatement Work Area until written authorization to resume work has been received from the Abatement Consultant.
  - .2 Isolate and clean area in the same manner applicable to the Abatement Work Area.
  - .3 Maintain work area isolation, and repeat clean-up operations until visual inspection and air monitoring results are at a level equal to that specified.
  - .4 At the discretion of the Abatement Consultant provide additional negative air units at locations specified in response to elevated fibre levels being detected in the Clean Change Room or Occupied Areas.
- .4 Results of PCM samples at or greater than 0.01 fibres per cubic centimeter of air (fibre/cc), collected within the Abatement Work Area enclosure after the site has passed a visual inspection, and an acceptable coat of lock-down agent has been applied, will indicate asbestos contamination of these areas. Respond as follows:
  - .1 Maintain work area isolation and re-clean entire work area. Then apply another acceptable coat of lock-down agent to exposed surfaces throughout the work area.

- .2 Repeat above measures until visually inspected and air monitoring results are at an acceptable level as specified.
- .3 Alternate to items above, the Asbestos Abatement Contractor can pay for analysis of PCM samples by Transmission Electron Microscopy (TEM) at NVLAP accredited laboratory.
  - .1 Enclosure to remain sealed, with negative pressure maintained, and subject to required daily inspections until TEM results are received.
- .5 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to the Owner.
- .6 Cost of additional inspection and sampling performed as a result of elevated fibre levels in areas outside the Abatement Work Area or from within the work area following completion of work, will be back-charged to the Contractor.

### **1.15 Worker Protection**

- .1 Instruct workers before allowing entry to the Abatement Work Area. Instruction shall include training in use of respirators, dress, showering, entry and exiting from an Abatement Work Area, and all other aspects of work procedures and protective measures.
- .2 Workers shall not eat, drink, chew gum or tobacco, vape or smoke in the Abatement Work Area.
- .3 Workers shall be fully protected at all times when possibility of disturbance of hazardous materials exists.
- .4 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Abatement Work Area.
- .5 Respiratory Protection
  - .1 Refer to each particular Section of the Specification for specified type of respiratory equipment specific to each phase or work area.
  - .2 Respirators shall be:
    - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
    - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Abatement Work Area has facial hair which affects the seal between respirator and face.
    - .3 Assigned to a worker for their exclusive use.
    - .4 Maintained in accordance with manufacturer's specifications.
    - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
    - .6 Repaired or have damaged or deteriorated parts replaced.
    - .7 Stored in a clean and sanitary location.
    - .8 Provided with new filters as necessary, according to manufacturer's instructions.
    - .9 Worn by personnel who have been fit checked by qualitative or

- quantitative fit-testing.
- .10 Instruction on proper use of respirators must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Provide protective clothing, to all personnel which:
  - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres or lead/silica dust.
  - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
  - .3 Once coveralls are worn, treat and dispose of as contaminated waste.
  - .4 Is replaced or repaired if torn or ripped.
- .4 Use hard hats, safety footwear and other protective equipment and apparel required by applicable construction safety regulations.

### **1.16 Visitor Protection**

- .1 Provide clean protective clothing and equipment to Authorized Visitors.
- .2 Instruct Authorized Visitors in the use of protective clothing and Abatement Work Area entry and exit procedures.
- .3 Authorized visitors are required to be fit tested on respirators, prior to entering Abatement Work Area.
  - .1 Respirator worn must be compliant with Section 13 and Table 2 of O.Reg. 278/05.

### **1.17 Signage**

- .1 Asbestos Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:
  - .1 There is an asbestos dust hazard.
  - .2 Access to the work area is restricted to persons wearing protective clothing and equipment.
- .2 Lead Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:
  - .1 There is a lead dust, fume or mist hazard.
  - .2 Access to the work area is restricted to authorized persons.
  - .3 Respirators must be worn in the work area.
- .3 Silica Warning Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:
  - .1 There is a silica dust hazard.
  - .2 Access to the work area is restricted to authorized persons.
  - .3 Respirators must be worn in the work area.

- .4 **Vehicles, Bins and Asbestos Waste Containers:** Post signs on both sides of every vehicle used for the transportation of asbestos waste and on every asbestos waste container. Signs must display thereon in large, easily legible letters that contrast in colour with the background the word “CAUTION” in letters not less than ten centimetres in height and the words:
  - .1 CONTAINS ASBESTOS FIBRES
  - .2 Avoid Creating Dust and Spillage
  - .3 Asbestos May be Harmful To Your Health
  - .4 Wear Approved Protective Equipment.
- .5 Place placards in accordance with Transportation of Dangerous Goods Act.

### **1.18 Differential Pressure Monitoring**

- .1 Provide and install differential pressure monitors as specified in each section.
- .2 Replace damaged or non-functional equipment at the request of the Abatement Consultant.
- .3 Record at minimum twice daily, and when damage to the enclosure is identified and repaired, the following information:
  - .1 Name of inspector.
  - .2 Date and time.
  - .3 Pressure reading.
  - .4 Repairs completed, if applicable.
- .4 Maintain specified differential pressure.
- .5 Stop contaminated work and take corrective action if pressure differential drops below the specified level. Notify the Abatement Consultant immediately.

### **1.19 Waste and Material Handling**

- .1 Waste bins must be placed on grade or in receiving.
- .2 All bins for hazardous materials must be covered and locked when waste transfer is not being performed.
- .3 Ensure redundant non-ACM, rubble, debris, etc. removed during contaminated work are treated, packaged, transported and disposed of as appropriate waste.
- .4 Clean, wash and apply Post Removal Sealant to metal waste prior to removal from Abatement Work Area. Recycle metals.
- .5 Clean, wash and apply Post Removal Sealant to non-porous materials prior to disposal as clean waste. Obtain prior written approval from the Abatement Consultant for each individual type of material.

- .6 Clean and wash equipment prior to removal from Abatement Work Area if removed prior to completion.
- .7 Place all equipment, tools and unused materials that cannot be cleaned in Abatement Waste Containers.
- .8 As work progresses, and at regular intervals, transport the sealed and labelled waste containers from the Abatement Work Area to waste bin.
- .9 Place items in bins according to waste classification. Place asbestos waste, lead waste, metals, non-asbestos waste, etc. in separate bins.
- .10 Removal of waste containers and decontaminated tools and materials from the Abatement Work Area shall be performed as follows:
  - .1 Remove any visible contamination from the surface of non-porous or cleanable waste being removed from the Abatement Work Area. If the item can be cleaned, remove it from the site as clean waste.
  - .2 Place waste or item in Waste Container and seal closed.
  - .3 Wet wipe outside of Waste Container.
  - .4 Within Decontamination Facility, Transfer Room or at the perimeter of the Abatement Work Area, place in second Waste Container. Seal closed.
  - .5 Remove waste containers and transport to appropriate bin.
- .11 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .12 Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled material in the case of a rupture of a Waste Container.
- .13 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owners operations.
- .14 Transport hazardous waste to landfill or waste transfer station licensed by the provincial Ministry of the Environment.
- .15 Cooperate with the provincial Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

## **1.20 Re-establishment of Objects and Systems**

- .1 Re-establish objects and items relocated by the Contractor's workforce to facilitate work.
- .2 Re-establish electrical, communication, HVAC and other services previously disconnected or otherwise isolated to accommodate work by this Section.

- .3 Make good at completion of work, all damage not identified in pre-removal survey.

## **PART 2 PRODUCTS AND FACILITIES**

### **2.1 Materials and Equipment**

- .1 Refer to the Sections identified in Related Work for specified materials, equipment or facilities specific to each phase or work area.
- .2 Materials and equipment must be in good condition and free of debris and fibrous materials. Disposable items must be of new materials only.
- .3 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .4 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of materials.
- .5 Asbestos Waste Container: A container acceptable to disposal site, Ministry of the Environment, and Ministry of Labour, comprised of the following:
  - .1 Dust tight.
  - .2 Suitable for the type of waste.
  - .3 Impervious to asbestos.
  - .4 Identified as asbestos waste.
- .6 Differential Pressure Monitor: a high precision instrument for measuring and controlling pressure differences in the low range, between the Abatement Work Area and Occupied Area. Calibrate regularly to manufacturer's instructions.
- .7 Discharge Ducting: Polyethylene Tubing. Reinforced with wire. Diameter to equal negative pressure machine discharge. Not to be longer than required, or so long that negative pressure is compromised.
- .8 Ground Fault Panel: Electrical panel as follows:
  - .1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical equipment and lights in Asbestos Work Area.
  - .2 Interrupters to have a 5 mA ground fault protection.
  - .3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.
  - .4 Openings sealed to prevent moisture or dust penetration.
  - .5 Inspected by the Electrical Safety Authority.
  - .6 Panel uses CSA approved parts and been constructed, inspected and installed by a licensed electrician.
  - .7 Provide one Ground Fault Panel for each 5,000 square feet (500 square metres) of Abatement Work Area.



- .9 HEPA Filtered Negative Pressure Machine: Portable air handling system which extracts air directly from the Abatement Work Area and discharges the air to the exterior of the building. Equipped as follows:
  - .1 Prefilter and HEPA filter. Air must pass HEPA filter before discharge.
  - .2 Pressure differential gauge to monitor filter loading.
  - .3 Auto shut off and warning system for HEPA filter failure.
  - .4 Separate hold down clamps to retain HEPA filter in place during change of prefilter.
- .10 HEPA Vacuum: Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.
- .11 Hose: Leak-proof, minimum bursting strength of 500 PSI or greater if required, abrasion resistant covering, reinforcing, and machined-brass couplings. Maintained and tested. Hose to be temperature resistant if it is to carry domestic hot water.
- .12 Lead Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment, that is:
  - .1 Dust tight.
  - .2 Suitable for the type of waste.
  - .3 Evaluated for leachable lead content, and disposed of in accordance with applicable regulations.
    - .1 Where lead waste exceeds 5.0 mg/L of lead in the TCLP analysis, label as lead waste and dispose of as leachate toxic hazardous waste.
    - .2 Where lead waste is below 5.0 mg/L of lead in the TCLP analysis, dispose of as construction waste.
- .13 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.
- .14 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.
- .15 Protective Clothing: Disposable coveralls complete with head covering and full body covering that fits snugly at the ankles, wrists and neck.
- .16 Rip-Proof Polyethylene Sheeting: 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and two (2) layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps.

- .17 Shower Hose: Water lines for supply of hot & cold water to shower facilities to be rated for use at 200 PSI (1380 kPa) or twice the working pressure whichever is greater. Supply lines to be continuous and free of fittings, joints or couplings.
- .18 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .19 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.
- .20 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

### **PART 3 EXECUTION**

- .1 Refer to the Sections identified in Related Work for specified procedures for work area preparation, maintenance, site dismantlement, application of lock-down agent and all other procedures for the safe handling, removal and clean-up of hazardous materials specific to each phase or work area.

### **END OF SECTION**

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## **PART 1 GENERAL**

### **1.1 General and Related Work**

- .1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 Requirements specified elsewhere:
  - .1 Section 02 81 00 Hazardous Materials – General Provisions

### **1.2 Outline of Work**

- .1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.
- .2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of asbestos-containing materials following Type 2 or Moderate Risk procedures, and Pinchin and Owner specific requirements.

### **1.3 Personal Protection**

- .1 Protect all personnel at all times when possibility of disturbance of ACM exists.
- .2 Provide the following minimum respiratory protection to all personnel:
  - .1 Full face respirators with P100 high efficiency (HEPA) cartridge filters, for:
    - .1 Removal of all or part of a ceiling if asbestos is likely lying on the surface.
    - .2 Use of a HEPA filtered power tool on non-friable ACM if the material is not wetted.
  - .2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
- .3 Provide protective clothing, to all personnel entering the Abatement Work Area.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

### **1.4 Inspections**

- .1 Refer to Section 02 81 00 – General Provisions.

## **PART 2 PRODUCTS AND FACILITIES**

- .1 Refer to Section 02 81 00.

### **2.2 Curtained Doorways**

- .1 Construct as follows:
  - .1 Install two flap doors, full width and height of door opening at all doors to Abatement Work Area and both ends of Transfer Room.
  - .2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head and alternate jambs.
  - .3 Install weights attached to bottom edge of each door flap.
  - .4 Provide direction arrows on flaps to indicate opening.

## **PART 3 EXECUTION**

### **3.1 Site Preparation - General**

- .1 Remove stored or non-fixed items from the Abatement Work Area including but not limited to equipment, furniture, waste etc. Store in area provided by Owner.
- .2 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.
- .3 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.
- .4 Isolate, at panel, and disconnect existing power supply to Abatement Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.
  - .1 Lock-out/tag-out power at electrical panels.
  - .2 Mark/tag any items within or passing through the Abatement Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.
- .5 Provide power from ground fault interrupt circuits.
- .6 Shut down HVAC systems serving the Abatement Work Area.
  - .1 Install polyethylene sheeting over openings in ducts and diffusers and seal.
  - .2 HVAC to remaining areas of building must not be disrupted during work of this section.
  - .3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.
  - .4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.
- .7 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc).

### **3.2 Site Preparation – No Enclosure Required**

- .1 Install caution tape around work area where existing walls are not present.
- .2 Cover walls, floors, finishes, millwork, equipment and furnishings remaining in the Abatement Work Area with polyethylene sheeting before disturbing ACM to control the spread of dust.
- .3 Install one layer of 6 mil polyethylene sheeting so as to protect all equipment and finishes in the Abatement Work Area that may be damaged. Items to remain include but are not limited to:
  - .1 Millwork.
  - .2 Doors.
  - .3 Bulkheads.
  - .4 Toilet Partitions.
  - .5 Plumbing fixtures.
  - .6 Electrical Equipment.
  - .7 Mechanical Equipment.
- .4 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.
- .5 Install temporary lighting in enclosure to a level that will provide for safe and efficient

use of work area - minimum 550 LUX.

- .6 Place HEPA vacuum in Abatement Work Area.
- .7 Place required tools to complete the abatement with the Abatement Work Area.

### **3.3 Maintenance of Abatement Work Area**

- .1 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.
- .2 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Abatement Work Area.
- .3 Inspect HEPA filtered negative pressure machines including discharge ducting at the beginning and end of each working period. Inspection must be performed by competent person.
- .4 Maintain Abatement Work Area in tidy condition.
- .5 Remove standing water on polyethylene/floor at the end of every shift.
- .6 Turn off water supply to any hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.

### **3.4 Asbestos Removal - General**

- .1 Do not use compressed air to clean or remove dust or debris.
- .2 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.
- .3 Frequently and at regular intervals, place all waste in asbestos waste containers.
- .4 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

### **3.5 Asbestos Removal - Other Non-Friable Asbestos Materials with HEPA Filtered Power Tools**

- .1 Use the procedures described above under *Site Preparation –No Enclosure Required*.
- .2 Wet all material to be disturbed.
- .3 Turn on HEPA vacuum. Vacuum to remain operation throughout work.
- .4 Place removed ACM directly into an asbestos waste container.
- .5 IF power tool can disconnect from HEPA vacuum, remove tool, and HEPA vacuum tool and bit, blade, etc, and shrouds.
- .6 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

### **3.6 Application of Post Removal Sealant**

- .1 Apply one coat of Post Removal Sealant with an airless sprayer, in accordance with Manufacturer's Instructions, to cover all surfaces on all items in the Abatement Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition.
- .2 Do not apply post removal sealant to materials that will be damaged by its application.

### **3.7 Abatement Work Area Dismantling**

- .1 Wash or HEPA vacuum equipment and tools used in contaminated Abatement Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Abatement Work Area.
- .2 Place tools and equipment used in contaminated work site but not cleaned in polyethylene bags prior to removal from Abatement Work Area.
- .3 Clean polyethylene sheeting and drop sheets which with HEPA vacuum or wet cleaning methods at completion of work.
- .4 Wet drop sheets and polyethylene sheeting.
- .5 Carefully roll polyethylene sheeting and drop sheets toward the centre of enclosure. As polyethylene is rolled away, immediately remove visible debris beneath with a HEPA vacuum.
- .6 Remove remaining polyethylene sheeting and tape, and dispose of as asbestos waste.
- .7 Place polyethylene sheeting, drop sheets, tape, disposal clothing and other contaminated waste in asbestos waste containers, wet wipe and place in second asbestos waste container.
- .8 Remove remaining site isolation, seals, tape, etc.
- .9 Remove Transfer Room.
- .10 Remove seals, tape, Signage etc.
- .11 Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.
- .12 Seal openings in HEPA vacuums.
- .13 Remove temporary lights.
- .14 Place contaminated materials including polyethylene sheeting, drop sheets, seals, tape, disposable coveralls, and other contaminated waste in asbestos waste containers.

### **3.8 Waste and Material Handling**

- .1 Refer to Section 02 81 00.

### **3.9 Re-Establishment of Items**

- .1 Upon completion of work:
  - .1 Move items that were removed from Abatement Work Area prior to work, back into same location within Abatement Work Area.
  - .2 Remove hose bibs installed and repair pipe.
  - .3 Reinstall ducts removed to perform cleaning of ducts or to access ACM.
  - .4 Clean, mop and vacuum Abatement Work Area and area beneath Decontamination Facilities.
  - .5 Enable building air handling systems.

### **END OF SECTION**

## **PART 1 GENERAL**

### **1.1 General and Related Work**

- .1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 Requirements specified elsewhere:
  - .1 Section 02 81 00 Hazardous Materials – General Provisions

### **1.2 Outline of Work**

- .1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.
- .2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of asbestos-containing materials following Type 3 or High Risk procedures, and Pinchin and Owner specific requirements.

### **1.3 Personal Protection**

- .1 Protect all personnel at all times when possibility of disturbance of ACM exists.
- .2 Provide the following respiratory protection to all personnel:
  - .1 Full Face Air Purifying Respirators with P100 high efficiency (HEPA) cartridge filters during projects when performing wet abatement of sprayed applied surfacing materials containing chrysotile asbestos, or wet abatement of other non-surfacing asbestos-containing material specified in this section.
  - .2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters for:
    - .1 Removing visible dust and friable material from surfaces in the work area prior to construction of enclosure.
    - .2 Dismantling of Type 3 (High Risk) enclosures, using Type 2 (Moderate Risk) Procedures.
- .3 Provide protective clothing, to all personnel entering the Abatement Work Area.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

### **1.4 Differential Pressure Monitoring**

- .1 Install differential pressure monitor at a location chosen by the Abatement Consultant.
- .2 Co-operate with the Abatement Consultant in collection of pressure monitoring data.
- .3 Maintain specified differential pressure at monitoring location. Negative air pressure is to be at least -0.02 inches of water, relative to the area outside the enclosed area.

### **1.5 Inspections**

- .1 Refer to Section 02 81 00 – General Provisions.

## **PART 2 PRODUCTS AND FACILITIES**

### **2.1 Materials and Equipment**

- .1 Refer to Section 02 81 00.

### **2.2 Hoarding Walls**

- .1 Type B Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of rip-proof polyethylene sheeting on each side of wall.
- .2 Windows: Install sufficient transparent windows in hoarding walls to allow observation of entire work area from outside the enclosure where existing solid walls do not make up the perimeter.

### 2.3 Decontamination Facilities

- .1 Workers' Decontamination Facility: A decontamination facility comprised of three linked rooms, Contaminated Change Room, a Shower Room, and a Clean Change Room.
  - .1 Rooms, Occupied Areas and Abatement Work Areas, shall be separated by curtained doorways at each door.
- .2 Contaminated Change Room: Room between Shower Room and Abatement Work Area.
  - .1 Locate on contaminated side of Shower Room.
  - .2 Install asbestos waste container for asbestos contaminated protective clothing.
  - .3 Install storage facilities for any personal protective equipment to be reused in Abatement Work Area including boots, hard hats, etc., but excluding respirators.
  - .4 Install hooks and shelves as required for personal protective equipment.
  - .5 Minimum size of generally 2 m x 2 m. Increase size accordingly to accommodate number of workers.
- .3 Shower Room: Room between Clean Change Room and Contaminated Change Room.
  - .1 Install one walk through shower unit for every six workers.
  - .2 Install constant supply of hot and cold water, controllable at each shower. Water supply must be sufficient to provide water at a minimum temperature of 40 degrees Celsius (maximum 50 degrees) in a volume required for all workers to properly decontaminate.
    - .1 Install individual hot and cold shut-off valves on water supply located on clean side of Shower Room. Connect shower to these valves.
    - .2 Install individual controls inside the shower to regulate water flow and temperature.
  - .3 Install rigid piping or Shower Hose with watertight connections for supply and drains.
  - .4 Install a sealed drip pan under and around the showers, 150 mm deep.
  - .5 Install sump pumps, sufficient for volume of waste shower water from showers and drip pan. Direct waste shower water to sanitary drains.
  - .6 Install ground fault protected power switch on clean side of shower for sump pumps, or timed for shut off.
  - .7 Provide adequate quantity of soap, shampoo, clean towels
  - .8 Install an Asbestos Waste Container for disposal of used respirator filters, on the contaminated side of the Shower Room.
- .4 Clean Change Room: A room between the Shower Room and Occupied Areas.
  - .1 Install hooks and shelves on clean side of shower in clean Change Room for storage of respirators.
  - .2 Install lockers or hangers for workers' street clothes and personal belongings.



- .3 Install vented wood door in wood frame at doorway to Occupied Area. Door must have locking passage set. Provide two keys to Abatement Consultant and one to Owner.
  - .4 Install hose bib on domestic cold water pipe for connection on clean side of Abatement Work Area.
  - .5 Install electric hot water tank for showers in decontamination facility.
  - .6 Provide ground fault protected power supply to hot water tanks, sump pump, battery chargers.
  - .7 Install a fire extinguisher, mount to wall.
  - .8 Minimum size of generally 2m x 2m. Increase size accordingly to accommodate number of workers.
- .5 Waste and Equipment Decontamination Facility: Waste and Equipment Decontamination Facility comprised of three linked rooms: a Container Cleaning Room, a Holding Room and a Transfer Room.
- .1 Purpose of Waste and Equipment Decontamination Facility is to provide a means to decontaminate asbestos waste containers, scaffolding, vacuums, and other tools and equipment and materials required in the Abatement Work Area.
  - .2 Rooms, Occupied Areas and Abatement Work Areas, shall be separated by curtained doorways at each door.
- .6 Container Cleaning Room: Room between Abatement Work Area and Holding Room of sufficient size to allow proper washing of equipment and waste containers or double bagging of asbestos waste. All wash water shall be treated as asbestos contaminated waste.
- .7 Holding Room: Room between Container Cleaning Room and Transfer Room, of sufficient size to accommodate at least two asbestos waste containers and two workers double bagging waste, or for largest item of equipment used.
- .1 Install a fire extinguisher mounted to wall.
- .8 Transfer Room: Room between Holding Room and Occupied Area, acting as an air lock for the transfer of waste.
- .1 Install vented wood door in wood frame at doorway to Occupied Area. Door must have locking passage set. Provide two keys to Abatement Consultant and one to Owner.
- .9 Construction of Decontamination Facilities
- .1 Install floor protection as follows:
    - .1 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting beneath entire decontamination facility.
    - .2 Turn 600 mm of polyethylene up the sides of the decontamination facility and overlap with the polyethylene sheeting covering the walls.
    - .3 Install plywood with taped and caulked joints between layers of 6 mil polyethylene where required to protect surfaces from water damage (e.g. carpet).
  - .2 Install walls as follows:
    - .1 Around all rooms, between all rooms, at entrance to Abatement Work Area and at entrance to Occupied Area.

- .2 Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates.
- .3 Install one layer rip-proof polyethylene sheeting on interior walls of Decontamination Facility.
- .4 Install one layer rip-proof polyethylene sheeting both sides on interior dividing walls of Decontamination Facility.
- .5 Install one layer rip-proof polyethylene sheeting over one layer of 6 mil polyethylene sheeting on walls exposed to the Abatement Work Area.
- .6 For perimeter walls exposed to the Abatement Work Area, install 13 mm plywood or OSB caulked and sealed at joints, beneath one layer of 6 mil and one layer of rip-proof polyethylene sheeting, on Abatement Work Area side of framing.
- .7 Install one layer rip-proof polyethylene sheeting over one layer of 6 mil polyethylene sheeting on walls exposed to the Occupied Area.
- .8 For perimeter walls exposed to the Occupied Area, install 13 mm plywood or OSB caulked and sealed at joints, over polyethylene sheeting, on Occupied Area side of framing. Paint with 2 coats white latex.
- .3 Install roof as follows:
  - .1 Install joists. Size of joists is to be determined by clear span. Consult Provincial Building Code. For clear spans up to 2850 mm use SPF Select 38 x 140 mm wood joist at 400 mm o/c with continuous 38 x 140 mm wood headers, and install strapping beneath joists.
  - .2 At the Contaminated Change Room and where roof is exposed to the Abatement Work Area, install 19 mm plywood or OSB over joists. Caulk and tape joints and install one layer rip-proof polyethylene sheeting over 2 layers of 6 mil polyethylene sheeting.
  - .3 Where roof is not exposed to the Abatement Work Area, install one layer rip-proof polyethylene sheeting over joists.
  - .4 Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls.
  - .5 At underside of joists in all rooms, install one layer of polyethylene sheeting.
  - .6 Minimum interior clear height 2000 mm to underside of joist.
- .10 Curtained Doorways
  - .1 Construct as follows:
    - .1 Install two flap doors, full width and height of door opening at all doors between chambers, facilities and Abatement Work Area.
    - .2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head and alternate jambs.
    - .3 Install weights attached to bottom edge of each door flap.
    - .4 Provide direction arrows on flaps to indicate opening.

## **PART 3 EXECUTION**

### **3.1 Clean Site Preparation**

- .1 Remove stored or non-fixed items from the Abatement Work Area, including but not limited to equipment, furniture, waste etc. Store in area provided by Owner.
- .2 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.
- .3 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 (Moderate Risk) Procedures.
- .4 Without disturbing asbestos-containing materials:
  - .1 Remove specified items and dispose as clean waste.
- .5 Install Hoarding Walls between Abatement Work Area and Occupied Area.
- .6 Install Decontamination facilities.
- .7 Install one layer of rip-proof polyethylene sheeting so as to protect all equipment and finishes in the Abatement Work Area that may be damaged and are not scheduled for removal.
- .8 Seal openings in floor using tape, polyethylene, etc. Openings in floor are to be sealed independently prior to installation of polyethylene sheeting on floor. Include duct registers in floors.
- .9 Seal openings in walls below ceiling level using polyethylene, tape etc. including but not limited to windows, doors, vents, diffusers, etc.
- .10 Seal openings in ceiling, using polyethylene, tape, etc. including diffusers, grills, etc.
- .11 Install one layer of rip-proof polyethylene sheeting on floor surfaces in Abatement Work Area where floors are not scheduled for removal.
- .12 Establish negative pressure in Abatement Work Areas as follows:
  - .1 Discharge HEPA filtered negative pressure machines as follows:
    - .1 To building exterior.
      - .1 Remove existing glazing where necessary and replace with a 19 mm plywood panel.
      - .2 Install panel securely on the exterior side of the window frame and make weather-tight with caulking.
      - .3 For each negative pressure unit, provide a 300 mm diameter, duct opening through panel.
      - .4 Cover duct opening with wire screen and/or chicken wire or extruded metal screen to prevent insect and animal entry.
      - .5 Direct discharge away from building access points.
      - .6 Store glazing for reinstallation upon completion of work.
    - .2 Use polyethylene discharge ducting or metal reinforced polyethylene discharge ducting in locations where the ducting must be protected from damage or collapse.
    - .3 Install and make airtight all negative air discharge ducting.
    - .4 Discharge ducting is not to be longer than required, and to be straight, so that the length of the ducting does not reduce the flow from negative pressure machines.
- .13 Install Ground Fault Panel.

- .14 Install temporary lighting in all work areas at levels that will provide for a safe and efficient use of the work area.
- .15 Isolate, at panel, and disconnect existing power supply to Abatement Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.
  - .1 Lock-out/tag-out power at electrical panels.
  - .2 Mark/tag any items within or passing through the Abatement Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.
- .16 Install hose bib on domestic cold water pipe for connection of hoses for wetting.
  - .1 Install hoses with watertight connections and airless sprayers to wet asbestos-containing materials.
- .17 Shut down HVAC systems serving the Abatement Work Area.
- .18 Provide heating within the work area as required.
- .19 Notify Abatement consultant Milestone Inspection - Clean Site Preparation. Obtain written approval for this Milestone Inspection before proceeding.
- .20 Install signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.
- .21 Post Ministry of Labour Notice of Project.

### 3.2 Contaminated Site Preparation

- .1 Perform the following using Type 3 (High Risk) procedures including using the required personal protective equipment specified.
  - .1 Remove lenses from light fixtures.
  - .2 Remove lamps from light fixtures. Lamps are to be recycled. Do not dispose of fluorescent lamps.
  - .3 Remove light fixtures and associated electrical supply cable back to the junction box.
  - .4 Remove PCB ballasts.
  - .5 Remove non-PCB ballasts.
  - .6 Remove diffusers.
  - .7 Seal openings in dormant rigid ductwork with 2 layers of rip-proof poly.
  - .8 Remove remaining ceiling tiles, grid and hangers.
  - .9 Temporarily support all existing electrical and mechanical services and items supported by the ceiling systems, that are not scheduled to be removed.
  - .10 Clean and protect electrical systems in the Abatement Work Area with polyethylene and tape. Include all communication, coaxial, triaxial, fire and public address systems, wiring, conduit, speakers, heat and smoke detectors, alarms, exit lights, junction boxes, etc.
    - .1 Mark/tag any items within or passing through the Abatement Work Area that are to remain live.
  - .11 Clean and seal holes or penetrations in deck, ducts, etc. when exposed by ceiling removal.
  - .12 Notify Abatement Consultant to the need for Milestone Inspection - Contaminated Perimeter Preparation.

### **3.3 Maintenance Of Contaminated Abatement Work Area**

- .1 Inspect Abatement Work Area at the beginning and end of each working period and once on each day work does not take place. Inspection must be performed by competent person.
- .2 Inspect HEPA filtered negative pressure machines including discharge ducting at the beginning and end of each working period. Inspection must be performed by competent person.
- .3 Perform Differential Pressure Monitoring on a frequent basis and record pressure at start and end of shift at a minimum.
- .4 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.
- .5 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Abatement Work Area.
- .6 Maintain Abatement Work Area in tidy condition.
- .7 Remove waste and debris frequently.
- .8 Remove standing water on polyethylene/floor at the end of every shift.
- .9 Turn off water supply to hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.
- .10 Turn off water supply to showers, at the end of every shift.
- .11 Ensure shower pans are pumped out at the end of every use and shift.

### **3.4 Wet Removal**

- .1 Do not use compressed air to clean or remove dust or debris.
- .2 Remove and dispose of remaining non-asbestos items before, during or after wet removal.
- .3 Spray asbestos-containing material with Amended Water using airless spray equipment prior to removal. Saturate ACM to prevent release of airborne fibres during removal.
- .4 Remove asbestos-containing material specified to be removed, clean substrate. Use power tools where required to remove ACM.
  - .1 Fully saturated ACM may be scraped directly into waste containers or may be allowed to fall to floor.
  - .2 ACM cannot be allowed to fall from one level to the next.
- .5 Remove obstructions as required to remove the ACM.
  - .1 Notify Abatement Consultant if item is not specified to be removed and inhibits removal of ACM.
  - .2 Do not demolish any existing walls etc. that form the perimeter of the Abatement Work Area without prior written permission from Abatement Consultant.
- .6 Clean the inside of ducts remaining in place.
- .7 All dislodged ACM shall be maintained in wet state until placed in asbestos waste containers for disposal.
- .8 As work progresses, and at regular intervals, place waste in asbestos waste containers and remove from the Abatement Work Area.

- .9 After completion of gross asbestos removal work, perform the following:
  - .1 Wet clean surfaces from which ACM has been removed with stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue and asbestos-containing materials.
  - .2 Wet clean surfaces which ACM has fallen on using stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue and asbestos-containing materials.
  - .3 Wet clean other surfaces in the Abatement Work Area, including the decontamination facilities, scaffolding, equipment, polyethylene sheeting on floor and walls surfaces etc., ducts and similar items not covered with polyethylene sheeting.
  - .4 Remove wash water as contaminated waste.
  - .5 Remove waste.
  - .6 Level of cleanliness must be acceptable to Abatement Consultant.
  - .7 Remove and dispose of the pre-filters from all negative air units as asbestos-contaminated waste.
- .10 Notify Abatement Consultant to the need for Milestone Inspection - Visual Clearance.

### **3.5 Waste and Material Handling**

- .1 Refer to Section 02 81 00.

### **3.6 Application Of Post Removal Sealant**

- .1 Wet Removal
  - .1 Obtain Abatement Consultant's written permission to proceed.
  - .2 Apply one coat of Post Removal Sealant with an airless sprayer, in accordance with Manufacturer's Instructions, to cover all surfaces on all items in the Abatement Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition.
    - .1 Do not apply post removal sealant to materials that will be damaged by its application.
  - .3 Notify Abatement Consultant to the need for Milestone Inspection – Clearance Sampling.

### **3.7 Air Clearance Monitoring**

- .1 Site must be dry prior to Air Clearance Monitoring.
- .2 The number of Air Clearance Monitoring samples will be as follows:
  - .1 2 samples for less than 10 square metres.
  - .2 3 samples for 10 to 500 square metres.
  - .3 5 samples for more than 500 square metres.
- .3 Restrict access to Abatement Work Area and operate negative air units for a 12 hour period prior to Milestone Inspection – Clearance Sampling.
- .4 The HEPA filtered negative pressure machines shall be in operation during clearance air monitoring.
- .5 In the presence of the Abatement Consultant, immediately prior to air clearance monitoring, use a leaf blower to dislodge loose fibre.

- .1 Direct leaf blower against walls, ceilings, floors, and other surfaces.
- .2 Perform this for at least five minutes per 1,000 sq. ft. of Abatement Work Area.
- .6 PCM samples will be collected as per Air Monitoring Section.

### **3.8 Abatement Work Area Dismantling**

- .1 Use Type 2 worker precautions during dismantling.
- .2 Operate negative air units during dismantling.
- .3 Polyethylene, tape, cleaning material, etc. to be treated as asbestos waste.
- .4 Wash remaining equipment and tools used in contaminated Abatement Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Abatement Work Area.
- .5 Clean Abatement Work Area, Equipment and Access area, washing/Showering Room.
- .6 Remove polyethylene sheeting.
- .7 Remove water hoses and shut off at source.
- .8 Remove Signs, Hoarding Walls, Decontamination Facilities.
- .9 Seal vacuum hoses and fittings, flexible ductwork and all tools used in contaminated work site in 6 mil polyethylene bags prior to removal from Work Area.
- .10 Remove temporary lights.
- .11 Remove negative air unit prefilters. Dispose of as asbestos contaminated waste.
- .12 Remove HEPA filtered negative pressure machines and discharge ducting.
- .13 Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.
- .14 Notify Abatement Consultant to the need for Milestone Inspection - Dismantling Inspection.

### **3.9 Re-Establishment of Items**

- .1 Upon completion of work:
  - .1 Move items that were removed from Abatement Work Area prior to work, back into same location within Abatement Work Area.
  - .2 Remove and disconnect Ground fault Panel, tags and locks from electrical panels and re-energize equipment and items.
  - .3 Remove hose bibs installed and repair pipe.
  - .4 Remove negative air discharge panel and reinstall glazing to match existing.
  - .5 Reinstall ducts removed to perform cleaning of ducts or to access ACM.
  - .6 Clean, mop and vacuum Abatement Work Area and area beneath any tunnels, platform and Decontamination Facilities.
  - .7 Enable building air handling systems.

END OF SECTION