

## PART 1 - GENERAL

### 1.1 SUMMARY OF SECTION

- .1 The intent of this section is to complete removals, as noted, ensuring the substrate, floor, walls, and concrete slab above is free and clear of fasteners, hangers, and adhesives, to accept the finish package as noted within the contract documents. As summarized and described, but not restricted to the following:
  - .1 Interior Demolition:
    - .1 Remove existing partitions, ceilings, finish flooring, casework, finish materials, equipment, and redundant services, as indicated.
    - .2 Remove fixtures, and ductwork as indicated on mechanical drawings.
    - .3 Refer to mechanical and electrical demolition drawings for removals, salvaged items, and units/systems left in place, and paragraphs 3.4 and 3.7 of this section.
    - .4 Remove adhesives and fasteners from substrates in preparation for new finishes.
    - .5 Remove existing fire hose cabinets as indicated.
    - .6 Work of this contract also occurs within the first and second floor space. Any removal or cutting required within this Contract; Contractor to expedite removal and reinstatement upon completion; coordinate with Department Representative.
    - .7 Coordinate demolition with the Phasing Plan.
  - .2 Exterior Demolition:
    - .1 Refer to the drawings for removals, for the provision of the new addition.
    - .2 Overhead doors are being replaced size for size.
    - .3 Departure Vestibule entrance replaced size for size.
    - .4 New location for location of the arrivals entrance.
    - .5 For main doors, windows and louvres install, refer to the documents.
- .2 Contractor to notify Consultant and Departmental Representative in writing of any demolition and removals Work above and beyond those notes in specifications and drawings before disposal.
- .3 Refer to Mechanical documents for extent systems to be retained or salvaged for reuse. Sprinkler mains and main water (hot cold recirc) to remain.
- .4 Refer to Electrical documents for extent of conduit/switches/lighting fixture and panel removals.

### 1.2 REFERENCES

- .1 Comply with National Building Code, Part 8, Construction Safety Measures at Construction and Demolition Sites, and Provincial requirements.
  - .2 Canadian Standards Association (CSA):
    - .1 CAN/CSA-Z317.13-12, Infection Control during Construction or Renovation and
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- .2 Maintenance of Health Care Facilities
- .2 CSA Z783-12, Deconstruction of buildings and their related parts
- .3 American Society of Testing and Materials International (ASTM):
  - .1 ASTM F710-11, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  - .2 ASTM F2170-16a, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

### 1.3 PREPARATION

- .1 Review site with Consultant and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

### 1.4 EXAMINATION

- .1 Carefully examine the site and contract documents to determine the nature and extent of the Work.

### 1.5 EQUIPMENT

- .1 Provide necessary scaffolding, runways, chutes, ramps, and ladders to carry out the work.
  - .1 Demolition will be phased, refer to the phasing description as noted in the documents.
  - .2 Erect dust barriers and partitions around areas where demolition is being carried out to the CSA Standard and as noted in Division 01.

### 1.6 DUST PROTECTION

- .1 Erect and maintain dustproof partitions for all situations where demolition work is carried out, for cutting of existing materials in occupied areas and for any other operation which generates dust. All barriers shall effectively seal and stop the spread of dust beyond the immediate work area. Refer to Division 01 sections in regards to type of dust partitions required and other dust control requirements. All occupied areas will be required to be vented to the exterior.
  - .2 Construct dustproof partitions by use of materials and methods which will prevent spread of dust, fumes and smoke to other parts of the building including pressurization. On completion, remove partitions and make good finished surfaces damaged or marred by partition to match adjacent surfaces.
  - .3 Ensure all construction areas are fully vented to the exterior, exhaust located not to impact fresh air system of the overall building.
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## 1.7 DISPOSAL

- .1 Materials and equipment removed and not specifically designated to be turned over to Departmental Representative or to be reinstalled becomes the property of the contractor for disposal off site.
- .2 Carry out disposal of material debris and removed building equipment with the intent of maximizing the recyclability of all materials and products removed.
- .3 Protect salvage materials and equipment and store in location designated by Department Representative.
- .4 Remove immediately from site, on a daily basis; no stockpiling.
- .5 Contaminated or dangerous materials, as defined by Authorities Having Jurisdiction relating to environmental protection, which is encountered in the process of demolition and removal work shall be immediately removed and disposed of in a safe manner in accordance with applicable regulations.
- .6 Provide an enclosed chute for disposal, direct from disposal area to garbage container below. To be confirmed and coordinated with Departmental representative.
- .7 Ensure location of waste containers and access to do not affect building operations or firefighting access areas.

## 1.8 BUILDING OPERATIONS

- .1 Carryout Work of this Section as expeditiously as possible with minimum interference to building operations and public safety, including all firefighting access and paths of travel.
- .2 Schedule and coordinate this work in accordance with the approved Construction Schedule.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Supply and install all materials necessary and required to carry out the Work of this Section.

## PART 3 - EXECUTION

### 3.1 DEMOLITION AND GENERAL REMOVALS

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- .1 Remove all items indicated on drawings and as required to complete the Work.
- .2 Carefully dispose of debris and materials in neat and organized manner. Sort and remove recyclable materials to local recycling facilities and/or approved landfills. Allow for daily sort and removal of debris.
- .3 Carryout demolition work using methods which minimizes dusting.
- .4 Remove all existing materials required to allow new construction and renovation work and upon completion of work, patch and make good all surfaces and finishes disturbed.
- .5 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace same as Work progresses.
- .6 Where the Work of this contract requires removal/installation of mechanical and electrical systems and equipment inside the existing building wall and ceiling construction, column cladding, bulkheads, etc., be responsible for opening walls, removing column and beam cladding and any other areas of the building fabric or construction, as necessary to expose the work areas. After removals have been carried out, new mechanical and electrical systems installed, all connections made and all work inspected, be responsible for restoring all disturbed surfaces to match their original, undisturbed condition. Replace broken or otherwise damaged fasteners and anchorage systems.
- .7 Demolition work to be performed in accordance with CAN/CSA Z317.13 and CSA Z783.
- .8 Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring products and finishes to specified condition.

### 3.2 CORE DRILLING AND SAW CUTTING MASONRY AND CONCRETE

- .1 Provide all required openings through concrete and masonry walls, floors and ceilings.
  - .2 Holes to be cut with diamond core drills and blades; jackhammering not allowed.
  - .3 Plan and lay out saw cutting and core drilling in advance so that openings are no larger than what is required.
  - .4 Before undertaking any core drilling or anchor attachment, commission a full survey of reinforcement steel in the areas to be drilled, and commission a review of core locations by a Structural Engineer. Survey and review shall be performed by a Structural Engineer licensed by the province of Newfoundland and Labrador. All core drilling to be performed only after receiving documented approval from the consulting engineer.
  - .5 Where adjacent walls, floor, ceiling and floor areas are damaged, or openings are cut larger than necessary as a result of the work of this contract, then replace wall, floor ceiling or roof construction to match existing.
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### 3.3 ABANDONED SERVICES

- .1 Remove abandoned electrical and mechanical services encountered in work of this section.
- .2 After removal, restore (including patching and painting) surfaces from which or out of which the abandoned services were removed. Restore surfaces to match adjacent, undisturbed surfaces.
- .3 The removal of these services shall in no way interfere with the operation of services which are to remain.
- .4 Cap abandoned services, mechanical and electrical, as per the Mechanical and Electrical Demolition drawings.

### 3.4 PROTECTION OF SERVICES/ELEMENTS TO REMAIN

- .1 Carefully protect all existing structures, finishes and materials that are to remain from damage during removal work and make good at own expense any damage thereto.
- .2 Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- .3 Protect electric, telephone, other wires, and plumbing services traversing premises at work area and in ceiling above, as well as in 2<sup>nd</sup> floor ceiling space.
- .4 Existing main ductwork/sprinkler mains, plumbing mains, refer to mechanical and electrical drawings and specifications.
- .5 Adjacent elevators must be protected, including but not limited to the car, cabling, finishes and trim components.
- .6 Two existing stairwells require protection, risers, treads and handrails.

### 3.5 SALVAGE AND/OR PROTECTED ITEMS

- .1 Main Ductwork and Components:
    - .1 Refer to mechanical documents for ductwork/fire dampers that are to remain as is and protected during the construction/deconstruction period.
  - .2 Sprinkler Main:
    - .1 Refer to mechanical drawings for existing sprinkler main left as is on site.
  - .3 Water Mains:
    - .1 Refer to mechanical drawings for existing hot, cold and recirculating water mains
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left in place and to be re-used.

### 3.6            CLEANING

- .1       Prior to reinstallation of existing materials or equipment, thoroughly clean those areas of items which may be inaccessible after installation.

END

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## PART 1 - GENERAL

### 1.1 RELATED WORK

- .1 Division 1 - General Requirements.
- .2 Comply with Asbestos Abatement Regulations, Latest Edition.

### 1.2 SECTION INCLUDES

- .1 Abatement Process:
  - .1 The General Contractor to provide an 'Abatement Procedure' to remove and dispose of the asbestos and hazardous materials noted in the document reports.
  - .2 The Abatement Procedure must be completed by a certified, registered specialist in Newfoundland and Labrador.
  - .3 The specialist must have a clean record of minimum of 5 years removal of such substance and disposal.
  - .4 The disposal area must be registered and certified by the province of Newfoundland and Labrador.
  - .5 The abatement procedures will describe the expected procedures at the start of each phase; testing, removal, wash down areas, final testing, and will including air testing, etc., for the requirements of Asbestos Removal in the Province of Newfoundland and Labrador.
- .2 Removal and Disposal (General):
  - .1 General Contractor to remove all hazardous material in methods described in the Abatement Procedure, using a company or team certified and registered in Newfoundland and Labrador.
  - .2 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
  - .3 Send hazardous wastes only 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 area is strictly prohibited.
- .3 Removal as specified of all spray or trowel-applied asbestos-containing material located as indicated, refer to Asbestos Plan in Appendix.
- .4 Encapsulation as specified of all spray or trowel-applied asbestos-containing material located as indicated.
- .5 Encapsulation of areas where asphaltic adhesive coating under spray or trowel-applied asbestos-containing material prevents complete removal of spray or trowel-applied asbestos-containing material.

- .6 Enclosure as specified of all spray or trowel-applied asbestos-containing material located as indicated.
- .7 Removal (other than defined minor amounts) of friable materials containing asbestos.
- .8 Use of power tools that are fitted with dust collectors equipped with a HEPA filter to cut, shape, grind, drill, scrape, or abrade manufactured products containing asbestos.
- .9 Cleaning, maintaining, or removal of air-handling equipment in buildings where sprayed fireproofing materials containing asbestos have been applied.

### 1.3 EXISTING SURVEYS (INFORMATION ONLY)

- .1 Survey for Asbestos and other Hazardous Material are described in two reports issued for information only:
  - .1 Asbestos Survey by Conestoga – Rovers and Associates dated 2011.
  - .2 Report- Room by Room Survey by all Tech Environmental Services February 2014

### 1.4 REFERENCES

- .1 Codes and standards referenced in this section refer to the latest edition thereof.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.205, Sealer for Application to Asbestos-Fibre-Releasing Materials.

### 1.5 DEFINITIONS

- .1 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.
- .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 identified under Existing Conditions (Article 1.7), including fallen materials and settled dust.
- .4 Asbestos Work Area: Area where actual removal, sealing and enclosure of spray or trowel-applied asbestos-containing materials takes place.
- .5 Authorized Visitors: Building Departmental Representative, Asbestos Abatement Consultant or designated representative , and persons representing regulatory agencies.
- .6 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.



- .7 Occupied Area: Any area of the building or work site that is outside the Asbestos Work Area.
- .8 Polyethylene sheeting sealed with tape: Polyethylene sheeting of type and thickness specified sealed with tape along all edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of asbestos fibres through the sheeting into a clean area.
- .9 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.
  - .4 Straps for sealing ends around pipe.
  - .5 Must incorporate internal closure strip if it is to be moved or used in more than one specific location.
- .10 DOP Test: A testing method used to determine the integrity of the Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.
- .11 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing a mist or fine spray. Must be appropriate capacity for scope of work.
- .12 Negative pressure: A system that extracts air directly from work area, filters such extracted air through a High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building. This system shall maintain a minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with an alarm to warn of system breakdown, and be equipped with an instrument to continuously monitor and automatically record pressure differences.
- .13 Airlock: A system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.
- .14 Curtained doorway: An arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows: Place two overlapping sheets of polyethylene over an existing or temporarily framed doorway, secure each along the top of the doorway, secure the vertical edge of one sheet along one vertical side of the doorway, and secure the vertical edge of the other sheet along the opposite vertical side of the doorway. Reinforce free edges of polyethylene with duct tape and weight the bottom edge to ensure proper closing. Each polyethylene sheet shall overlap openings not less than 1.5 m on each side.
- .15 Competent person: in relation to specific work, means a worker who:
  - .1 Is qualified because of knowledge, training and experience to perform the work.
  - .2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.
  - .3 Has knowledge of all potential or actual danger to health or safety in the work.

- .16 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

## 1.6 SUBMITTALS

- .1 Before commencing work:
- .1 Obtain from the appropriate agency and submit to Departmental Representative's Representative all 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's Representative that suitable arrangements have been made to receive and properly dispose of asbestos waste.
  - .2 Submit proof satisfactory to Departmental Representative's Representative that all employees have had instruction on the hazards of asbestos exposure, respirator use, dress, use of showers, entry and exit from work areas, and all aspects of work procedures and protective measures. Supervisory personnel shall have attended an asbestos abatement course, of not less than two days duration, approved by the Departmental Representative's Representative. Submit proof of attendance in the form of a certificate. Minimum of one Supervisor for every five workers.
  - .3 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative's Representative for review.
  - .4 Submit documentation including test results for sealer proposed for use.
  - .5 Submit Provincial and/or local requirements for Notice of Project Form.
  - .6 Submit proof of Contractor's Asbestos Liability Insurance.
  - .7 Submit proof satisfactory to the Departmental Representative's Representative that all employees have respirator fitting and testing. Workers must be fit-tested with the respirator that is personally issued.
  - .8 Submit Workplace Health, Safety and Compensation Commission status and transcription of insurance.
  - .9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets for chemicals or materials including but not limited to the following:
    - .1 encapsulants;
    - .2 amended water;
    - .3 slow-drying sealer.

## 1.7 REGULATORY REQUIREMENTS

- .1 Comply with Federal, Provincial, and local requirements pertaining to asbestos, provided that in case of conflict among those requirements or with these specifications the more stringent requirement applies. Comply with regulations in effect at the time the work is performed.
- .2 Follow Newfoundland Regulation of the Occupation Health and Safety Act, Asbestos Abatement Regulations, Latest Edition. All work as defined under this section must be

completed by a “Qualified Asbestos Abatement Contractor” (registered with the Government of Newfoundland and Labrador)

- .3 Follow regulations for the transport of asbestos waste, specifically the Transportation of Dangerous Goods Act, latest edition.
- .4 Follow regulations for the disposal of asbestos waste, specifically Waste Management Regulations and Waste Material Disposal Areas Regulations.

#### 1.8 EXISTING CONDITIONS

- .1 Prior to commencing of work, verify with Departmental Representative’s Representative, and review whether an asbestos audit and/or Asbestos Management Plan are in place for the building.
- .2 Information contained in audits and plans are for general information only and are not necessarily representative of all asbestos containing materials covered within the scope of this project.
- .3 Notify Departmental Representative’s Representative of materials believed to contain asbestos encountered during the execution of work that is not contained in the audits and plans. Do not disturb such materials until instructed by Departmental Representative’s Representative.

#### 1.9 INSTRUCTION AND TRAINING

- .1 Before commencing work, provide to the Departmental Representative’s Representative satisfactory proof that every worker has had instruction and training in the hazards of asbestos exposure, in personal hygiene including dress and showers, in entry and exit from the Asbestos Work Area, in all aspects of work procedures including glove bag procedures, and in the use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, at a minimum:
  - .1 Proper fitting of the equipment.
  - .2 Inspection and maintenance of the equipment.
  - .3 Disinfecting of the equipment.
  - .4 Limitations of the equipment.
- .3 Instruction and training must be provided by a competent, qualified person.
- .4 Supervisory personnel to complete required training.

#### 1.10 WORKER PROTECTION

- .1 Protective equipment and clothing to be worn by workers while in the Asbestos Work Area includes:
  - .1 Respirator equipped with HEPA filter cartridges, personally issued to the worker and marked as to efficiency and purpose, and acceptable to the Provincial Authority having jurisdiction as suitable for the type of asbestos and the level of

- asbestos exposure in the Asbestos Work Area. If disposable type filters are used, provide sufficient filters so that workers can install new filters following disposal of used filters and before re-entering contaminated areas.
- .2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.
  - .2 Each worker shall:
    - .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 . All street clothes, uncontaminated footwear, towels, and similar uncontaminated articles shall be stored in clean change room.
    - .2 Remove gross contamination from clothing before leaving work area then proceed to Equipment and Access Room. Place contaminated worksuits in receptacles for disposal with other asbestos - contaminated materials Clean outside of respirator with soap and water. Remove respirator; remove filters and wet them and dispose of filters in the container provided for the purpose; and wash and rinse the inside of the respirator. When not in use in the 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 Provide facilities for washing and/or showering when leaving Asbestos Work Area, which shall be used by every worker. Hot and cold water supply is to be provided in such a manner to allow workers to adjust water temperature during decontamination.
    - .4 Enter the unloading room from outside dressed in clean coveralls to remove waste containers and equipment from the Holding Room of the Container and Equipment Decontamination Enclosure system. No worker shall use this system as a means to leave or enter the work area.
  - .3 Workers shall not eat, drink, smoke or chew gum or tobacco at the work site except in established clean room.
  - .4 Workers shall be fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual asbestos abatement.
  - .5 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in 1.9 of this section, in both official languages.
  - .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects the seal between the respirator and the face.

#### 1.11 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 and respirators.

- .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from work areas.

#### 1.12 NOTIFICATION

- .1 Not later than ten (10) working days before commencing work on this project notify the Occupational Health and Safety Division in writing as per Regulation 194/91, Section 34 Sub-Section (7). Provide telephone notification immediately prior to start of work.
- .2 Notify Sanitary Landfill site.
- .3 Inform all sub-trades of the presence of friable asbestos-containing materials identified in the Existing Conditions.
- .4 Submit to the Departmental Representative's Representative a copy of all notifications prior to the start of work.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- .1 All materials and equipment brought to work site must be in good condition and free of asbestos, asbestos debris, and fibrous materials. Disposable items must be of new materials only.
- .2 Polyethylene: Minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .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's Representative, mixed with water in a concentration to provide adequate penetration and wetting of asbestos-containing material.
- .5 Asbestos waste containers: Metal or fibre - type acceptable to dump operator with tightly fitting covers and 0.15 mm minimum thickness sealable polyethylene liners. Labelling requirements: Affix a pre-printed cautionary asbestos warning, in both official languages, that is clearly visible when ready for removal to disposal site.
- .6 Encapsulants : Type 2 surface film forming type Class A water based conforming to CAN/CGSB-1.205, ULC listed.
- .7 Glove bag: Acceptable materials include safe-T-strip products in configuration suitable for work, or alternative material approved by addendum during the tendering period in accordance with the Instructions to Tenderers. Glove bags intended for use in more than one location must be equipped with a reversible, double-pull, double-throw zipper on the top and at approximately the mid-section of the bag.

- .8 Slow drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for the purpose of trapping residual asbestos fibres. Sealer shall have flame spread and smoke developed rating less than 50

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- .1 Work Areas:
  - .1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other areas of the building during work phase. Conduct smoke tests to ensure that duct work is airtight. Active return air ducts within the Asbestos Work Area shall have all joints and seams rigid seal and caulked.
  - .2 Clean proposed work area using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use a wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.
  - .3 Put negative pressure system in operation and operate continuously from the time the first polyethylene is installed to seal openings until final completion of the work including final cleanup. Provide continuous monitoring of pressure difference using an automatic recording instrument.
  - .4 Seal off all openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
  - .5 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.
  - .6 Build airlocks at all entrances to and exits from work area so that work area is always closed off by one curtained doorway when workers enter or exit.
  - .7 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where the number in parentheses indicates the 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)".
  - .8 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's Representative. Use localized water spraying during fixture removal to reduce fibre dispersal.
  - .9 Maintain emergency and fire exits from work area, or establish alternative exits satisfactory to Provincial Fire Commissioner.
  - .10 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.

- .11 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 ceiling debris and immediate work area with amended water (see definition in Section 1.4.2) to reduce dust, as work progresses.

.2 Worker Decontamination Enclosure System:

- .1 Worker Decontamination Enclosure System shall comprise an Equipment and Access Room, a Wash Area Room, and a Clean Room, as follows:
  - .1 Equipment and Access Room: Build an Equipment and Access Room between Wash Area Room and work area, with two curtained doorways, one to the Wash Area Room and one to work area . Install portable toilet, waste receptor, and storage facilities for workers' shoes and any protective clothing to be reworn in work area. The Equipment and Access Room shall be large enough to accommodate specified facilities, any other equipment needed, and at least one worker allowing him /her sufficient space to undress comfortably.
  - .2 Wash Area Room: Build a Wash Area Room between the Clean Room and Equipment and Access Room, with two curtained doorways, one to the Clean Room and one to Equipment and Access Room. Provide a constant supply of hot and cold or warm water. Provide piping and connect to water sources and drains. Pump waste water through a 5 micrometre filter system acceptable to Departmental Representative's Representative before directing into drains. Provide soap, clean towels , and appropriate containers for disposal of used respirator filters.
  - .3 Clean Room: Build a Clean Room between the Wash Area Room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to Wash Area Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install a mirror to permit workers to fit respiratory equipment properly.

.3 Container and Equipment Decontamination Enclosure System:

- .1 Container and Equipment Decontamination Enclosure System consists of a Staging Area within the work area, a Holding Room, and an Unloading Room. The purpose of this system is to provide a means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which the Worker Decontamination Enclosure System is not suitable.
  - .1 Staging Area: Designate a Staging Area in the 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. Staging Area shall have a curtained doorway to the Washroom.
  - .2 Holding Room: shall be of sufficient size to accommodate at least two waste containers and the largest item of equipment used.

- .3 Unloading Room: Build an Unloading Room between the Holding Room and outside, with two curtained doorways, one to the Holding Room and one to outside.
- .4 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 a doorway, one of the two closures comprising the doorway always remains closed.
- .5 Separation of Work Areas from Occupied Areas:
  - .1 Separate parts of the building required to remain in use from parts of the building used for asbestos abatement by means of an 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 all joints between plywood sheets and between plywood and adjacent materials with surface film forming type sealer, to create an airtight barrier.
    - .2 Cover plywood barrier with polyethylene sealed with tape, as specified for work areas.
- .6 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 the beginning of each working period.
  - .4 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative's Representative.
- .7 Asbestos Abatement work shall not commence 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 and parts of the building required to remain in use are effectively segregated.
  - .4 Tools, equipment, and materials waste containers are on hand.
  - .5 Arrangements have been made for building security.
  - .6 Warning signs specified in PART 3 are displayed where access to contaminated areas is possible.
  - .7 All notifications have been completed and other preparatory steps have been taken.



- .1 A minimum of one Supervisor for every five workers is required. Refer to Asbestos Abatement Regulations for definition and training of supervisor.
- .2 An approved Supervisor must remain within the Asbestos Work Area at all times during the 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 the specified wetting agent, using airless spray equipment capable of providing a "mist" application to prevent release of fibres. Saturate the asbestos material sufficiently to wet it to the substrate without causing excess dripping. Spray the asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.
- .2 Remove the saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed pack the 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 the Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, all surfaces from which asbestos has been removed shall be wire brushed and wet-sponged to remove all visible material. During this work keep the surfaces wet.
- .5 Where Departmental Representative's Representative decides complete removal of asbestos-containing material is impossible due to obstructions such as structural members or major service elements, and provides a written direction, encapsulate the 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, and after encapsulating asbestos-containing material impossible to remove, wet clean the entire work area including the Equipment and Access Room, and equipment used in the process. After a 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.

### 3.4 PIPE INSULATION REMOVAL USING GLOVE BAG

- .1 Place tools necessary to remove insulation in tool pouch. Wrap the bag around pipe and close zippers. Seal bag to pipe with cloth straps.
- .2 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.
- .3 Insert nozzle of a garden reservoir type sprayer into bag through valve and wash down pipe and interior of bag thoroughly. Wet surface of insulation in lower section of bag.
- .4 When glove bags are intended for use at more than one location: After wash-down and application of sealer, seal off waste in lower section of bag using zipper at mid-section of bag. Remove air from top section of bag through the elasticized valve using a HEPA vacuum. Remove bag from pipe, reinstall in new location, and reseal to pipe prior to opening the lower section of the bag. Repeat stripping operation.
- .5 If bag is to be moved along pipe, first remove air from top section through the elasticized valve using a HEPA vacuum. Next loosen straps, move bag, re-seal to pipe using double-pull zipper to pass hangers. Repeat stripping operation.
- .6 To remove bag after completion of stripping, wash top section and tools thoroughly. Remove air from top section through the elasticized valve using a HEPA vacuum. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in water. Remove second strap and zipper. Fold over into waste container and seal.
- .7 After removal of bag ensure that pipe is free of all residue. Remove all residue using HEPA vacuum or wet cloths. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow-drying sealer to seal in any residual fibres.
- .8 Upon completion of work shift, cover exposed ends of remaining pipe insulation with polyethelene taped in place.

### 3.5 FINAL CLEANUP

- .1 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum all visible asbestos-containing particles observed during cleanup, immediately, using HEPA vacuum equipment.
- .2 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .3 Work areas, Equipment and Access Room, Wash Area Room, and other enclosures that may be contaminated shall be included in the clean-up.
- .4 Sealed waste containers and all equipment used in the work shall be included in the cleanup and shall be removed from work areas, via the Container and Equipment Decontamination Enclosure System, at an appropriate time in the cleaning sequence.

- .5 A final check shall be carried out to ensure that no dust or debris remains on surfaces as a result of dismantling operations and air-monitoring shall be carried out again to ensure that asbestos levels in the building do not exceed 0.10 fibres/cc. Repeat cleaning using HEPA vacuum equipment, or wet cleaning methods where feasible, in conjunction with sampling until levels meet this criteria.
- .6 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 who shall ensure that dumping is done in accordance with governing regulations.

### 3.6 AIR MONITORING

- .1 From commencement of work until completion of cleaning operations , air samples will be taken on a daily basis both inside and outside of work area enclosure in accordance with Asbestos Abatement Regulations (personal, perimeter and clearance) and conforming to applicable NIOSH sampling protocol. (ie: NIOSH 7400)
- .2 Results of air monitoring inside the work area will be used to establish the type of respirators to be used. Workers may be required to wear sample pumps for up to full-shift periods. If fibre levels are above the safety factor of the respirators in use, the abatement will be stopped, means of dust suppression will be applied, and a higher safety factor in respiratory protection will be used by all persons inside the enclosure. If air monitoring shows that areas outside work area enclosures are contaminated, these areas shall be enclosed, maintained and cleaned, in the same manner as that applicable to work areas.
- .3 During the course of the work, fibre content of the air will be measured by a PCM test. If PCM measurements exceed 0.10 f/cc work will be stopped until procedures are corrected.
- .4 Conduct final air monitoring as follows: After the Asbestos Work Area has passed a visual inspection, an acceptable coat of lock-down agent has been applied to all surfaces of the enclosure, and an appropriate setting period has passed, perform air monitoring within the Asbestos Work Area. Final air monitoring results must show fibre levels of less than 0.10 f/cc. If air monitoring results show fibre levels in excess of 0.10 f/cc, re-clean the work area and apply another acceptable coat of lock-down agent to all surfaces. Repeat as necessary until fibre levels are less than 0.10 f/cc.

### 3.7 INSPECTION

- .1 Inspection of the Asbestos Work Area will be performed to confirm compliance with the requirements of the specifications and governing authorities. Deviation from the Asbestos Abatement Regulations is not accepted without prior approval of the governing authority. Any deviation from these requirements that have not been approved in writing by the Departmental Representative's Representative and the governing authority may result in a stoppage of work, at no cost to the Departmental Representative.
- .2 The Departmental Representative's Representative is empowered to inspect adherence to specific procedures and materials, and to inspect for final cleanliness and completion.

Additional labour or materials expended by the Contractor to provide performance to the level specified shall be at no additional cost.

- .3 The Departmental Representative's Representative is empowered to order a shutdown of work when a leakage of asbestos from the Asbestos Work Area has occurred or is likely to occur. Additional labour or materials expended by the Contractor to provide performance to the level specified shall be at no additional cost.

END