

1.0 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 Related work specified elsewhere:
Division 13, Section 13082 Asbestos Abatement – Type 2
- .3 Site Conditions identifies the location and asbestos content of all known asbestos-containing materials (ACMs) to be disturbed by work of this Contract. The information provided is for general reference only. Each Contractor must confirm existing conditions on site prior to tender close.
- .4 This Section shall govern over all work of the Contract which will, or may, disturb ACMs or surfaces or materials which may have been or become contaminated by ACM either during or prior to work of this Contract.
- .5 It is the intent that work performed as per this Section will result in the removal of all ACM and the decontamination of all surfaces or materials which may have been or become contaminated by ACM either during or prior to work of this Contract.

1.2 Outline of Work

- .1 Refer to Section 13082 of the Specification for a specific outline of work and specified personnel protective measures for the safe handling, removal, and clean-up of asbestos specific to each phase or work area.
- .2 Protect surfaces, building fabrics and items remaining within the Asbestos Work Area.
- .3 Isolate the Asbestos Work Area from adjoining Occupied and Non-Occupied Areas whether present at an interior or exterior location.
- .4 Remove, clean and replace at completion of work, non-operating mechanical and electrical equipment, ducting, building components, materials or items removed to accommodate asbestos removal.
- .5 Remove and dispose of as asbestos-containing waste, building components, materials and items contaminated by asbestos that cannot be effectively cleaned.
- .6 Encapsulate remaining ACMs at locations where removal is deemed impractical by the Asbestos Abatement Consultant.
- .7 Final clean work area to remove visible signs of asbestos, other debris or settled dust.

- .8 Apply lock-down agent to exposed surfaces throughout the work area and to surfaces from which any asbestos had been removed.
- .9 Unless otherwise specified, the handling, removal, clean-up or repair of ACMs or surfaces contaminated with asbestos is to be performed following wet removal techniques.

1.3 Site Conditions

- .1 Mechanical insulation present on the generator exhaust breeching is known to contain Chrysotile asbestos.
- .2 Immediately stop work in the area and notify the Asbestos Abatement Consultant should unexpected materials, or materials suspected of containing asbestos be encountered. Do not resume work in the area until it has been determined if the material encountered contains asbestos and authorization to resume work is given.

1.4 Definitions

- .1 Airlock: Temporary chamber which permits ingress or egress from an Asbestos Work Area without permitting air movement through to non-contaminated areas.
- .2 Amended Water: Water with wetting agent added for the purpose of reducing surface tension to allow thorough wetting of ACM.
- .3 Asbestos-Containing Material (ACM): Material identified under Site Conditions including any debris, overspray, fallen material and settled dust.
- .4 Asbestos Work Area: Area where work takes place which will, or may, disturb ACM.
- .5 Authorized Visitors: City Personnel, Asbestos Abatement Consultant, or designated representative, and persons representing regulatory agencies.
- .6 Contaminated Waste: Material identified under Site Conditions, including fallen material, settled dust, other debris and materials or equipment deemed to be contaminated by the Asbestos Abatement Consultant.
- .7 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.
- .8 DOP Test: A testing method used to determine the integrity of the Negative Pressure unit or vacuum using dioctyl phthalate (DOP) HEPA filter leak test.
- .9 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.

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- .10 HEPA Filter: High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.
 - .11 Milestone Inspection: Inspection of the Asbestos Work Area at a defined point in the abatement operation.
 - .12 Negative Pressure: A reduced pressure within the Asbestos Work Area (>0.04 in.) established by extracting air directly from Asbestos Work Area and discharging it to exterior of building. Volume of air extracted must be sufficient to provide one (1) air change every 20 minutes during wet removal and once every 15 minutes during dry removal while ensuring that at all times, air movement flows into the Asbestos Work Area as determined by visual or smoke testing to the satisfaction of the Asbestos Abatement Consultant.
 - .13 Occupied Area: Any area of the building or adjoining space outside the Asbestos Work Area.
 - .14 Polyethylene: Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection to underlying surfaces and to prevent the escape of airborne fibres.

1.5 Regulations

- .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.

1.6 Quality Assurance

- .1 Removal and handling of asbestos-containing or asbestos-contaminated materials is to be performed by persons trained in the methods, procedures and industry practices for Asbestos 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 Asbestos 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 Asbestos Work Area at no cost to the City.
- .5 All work of this Section involving electrical, mechanical, carpentry, glazing, etc., shall be performed by licensed persons experienced and qualified for the work required.

1.7 Inspection

- .1 Provide and pay for site inspection services as specified herein.

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- .2 Retain the services of the Asbestos Abatement Consultant (Pinchin Environmental Ltd.) to perform, in addition to any specified Milestone Inspections, at a minimum, one (1) randomly scheduled site inspection per 8 hour work shift during all active removal, repair or clean-up of asbestos-containing or asbestos-contaminated materials.
 - .3 From commencement of work until completion of clean-up operations, the Asbestos Abatement Consultant will be empowered by the City to inspect for compliance with the requirements of governing authorities, adherence to specified procedures and materials, and to inspect for final cleanliness and completion.
 - .4 The Asbestos Abatement Consultant is empowered by the City to order a shutdown of work when leakage of asbestos from the controlled work area has occurred, or is likely to occur.
 - .5 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 City.
 - .6 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 City.
 - .7 Any inspections performed as a result of Contractor's failure to perform satisfactorily regarding quality, safety, or schedule, shall be back charged to the Contractor.
 - .8 Facilitate inspection and provide access as necessary. Make good work disturbed by inspection and testing at no cost to the City.
 - .9 Refer to Section 13082 of the Specification for specified milestone inspections which are to take place in addition to the above noted random inspections, and at defined points throughout the abatement operation specific to each phase or work area.
 - .10 Provide 24 hours written notice to the Asbestos Abatement Consultant of any request for scheduling of milestone inspections or transportation of waste through Occupied Areas. A copy of the standard form for use on this project is available through the Asbestos Abatement Consultant. A sample form has also been provided for reference purposes as an appendix to the Specification.
 - .11 Do not proceed with next phase of work until written approval of each milestone is received from the Asbestos Abatement Consultant.

1.8 Air Monitoring

- .1 Provide and pay for air monitoring services as specified herein.

- .2 Retain the services of the Asbestos Abatement Consultant (Pinchin Environmental Ltd.) to complete at a minimum, the following level of air monitoring:
 - .1 Collection and analysis of one (1) PCM air sample at the perimeter of each separate Asbestos Work Area once per 8 hour work shift during all active removal, repair or clean-up of asbestos-containing or asbestos-contaminated materials.
 - .2 Collection and analysis of one (1) PCM air sample within each separate Asbestos Work Area once per 8 hour work shift during all active removal, repair or clean-up of asbestos-containing or asbestos-contaminated materials.
 - .3 Collection and analysis of one (1) PCM air sample, per every 2,500 sq. ft., to be collected within each Asbestos Work Area following the completion of all asbestos removal, repairs or clean-up, but prior to re-occupancy of the area by non-protected personnel.
- .3 Air monitoring will be performed using Phase Contrast Microscopy (PCM) following the National Institute for Occupational Safety and Health Method 7400.
- .4 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.
- .5 Results of PCM samples of 0.05 fibres per millilitre of air (fibre/mL) or greater, outside an Asbestos Work Area, will indicate asbestos contamination of these areas. Respond as follows:
 - .1 Suspend work within the adjoining Asbestos Work Area until written authorization to resume work has been received from the Asbestos Abatement Consultant.
 - .2 Isolate and clean area in the same manner applicable to the Asbestos Work Area.
 - .3 Maintain work area isolation, and repeat clean-up operations until visually inspection and air monitoring results are at a level equal to that specified.
- .6 Results of PCM samples in excess of 0.05 fibres per millilitre of air (fibre/mL), collected within a Type 2 Asbestos 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 a level equal to that specified.
- .7 Where results of PCM sampling exceed 5.0 fibre/mL within a Type 2 Asbestos Work Area respond as follows:
 - .1 Immediately stop work within the Asbestos Work Area.
 - .2 Instruct workers to exit the Asbestos Work Area via the Worker Decontamination Facility while observing specified personnel exiting procedures.
 - .3 Contractor's forces shall not re-enter the Asbestos Work Area for a period of 8 hours or until authorized by the Asbestos Abatement Consultant.
 - .4 Upon re-entry to the Asbestos Work Area, mist the air, any fallen debris or exposed surfaces with amended water using an airless sprayer.
- .8 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 City.
- .9 Cost of additional inspection and sampling performed as a result of elevated fibre levels in areas outside the Asbestos Work Area or from within the work area following completion of work, will be back charged to the Contractor.

1.9 Supervision

- .1 Provide on site for each work shift, a Shift Superintendent, 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 at risk of disturbing asbestos, the Shift Superintendent must be on site. Failure to comply with this requirement will result in a stoppage of all work, at no cost to the City.
- .4 Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the City. The City reserves the right to request replacement of supervisory personnel without explanation.

- .5 Do not replace supervisory personnel without written approval from the City.

1.10 Notification

- .1 Not later than ten (10) days before commencing work on this project, notify in writing the local office of Manitoba Labour and Immigration, Workplace Safety and Health Division. Provide telephone notification again immediately prior to start of work.
- .2 Notify sanitary landfill site as per local requirements.
- .3 Inform all trades on site of the presence and location of ACMs identified in the Contract documents.

1.11 Submittals

- .1 Submit prior to starting work:
 - .1 Proof of required licensing for transportation of asbestos waste.
 - .2 Names and credentials of the:
 - .1 Shift Superintendent.
 - .3 Proof in the form of a certificate that supervisory personnel have attended training courses on asbestos removal (2 day minimum duration) and have performed supervisory function on at least five (5) other asbestos projects of similar size and complexity.
 - .4 Proposed schedule (prepared in chart format) detailing the following:
 - .1 Duration of site preparation, contaminated preparation, removal, clean-up and site dismantlement for each phase area.
 - .2 Proposed average daily work force and shifting.
 - .5 Shop drawings for each Asbestos Work Area detailing the following:
 - .1 Any proposed deviation from specifications, procedures, or drawings.
 - .2 Installation of negative air discharge panels.
 - .6 Documentation including test results, fire and flammability data, samples, and Material Safety Data Sheets for chemicals or materials used in the course of the Asbestos Abatement project including or not limited to:
 - .1 Encapsulants.
 - .2 Wetting agents.
 - .3 Lock-down agent.

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- .4 Rip-proof polyethylene.
 - .5 Polyurethane foam.
 - .6 Chemicals or materials used in the course of asbestos abatement.
 - .7 Negative air unit performance data and results of DOP tests as required.
 - .8 Proof that all employees have been fit-tested for the respirator appropriate for the work being performed.
 - .9 Proof that all employees have had instruction on hazards of asbestos exposure, use of respirator and all aspects of work procedures and protective measures.
 - .10 Proof that all employees are listed on an asbestos work report and have been given required medical examinations.
 - .11 Pre-removal survey of damage in all areas where asbestos abatement work will take place or waste will be transported.
 - .12 Copy of notification to governing authorities of commencement of work.
 - .2 Submit on a weekly basis, and at completion of work:
 - .1 Completed Waste Manifest forms.

1.12 Worker Protection

- .1 General
 - .1 Instruct workers before allowing entry to the Asbestos Work Area. Instruction shall include training in use of respirators, dress, showering, entry and exiting from an Asbestos Work Area, and all other aspects of work procedures and protective measures.
 - .2 Workers shall not eat, drink, smoke or chew gum or tobacco except in established locations outside the Asbestos Work Area.
 - .3 Workers shall be fully protected at all times when possibility of disturbance of asbestos exists.
 - .4 Provide and post at access points to the Asbestos Work Area, the procedures described under Worker Protection.
- .2 Respiratory Protection
 - .1 Refer to Section 13082 of the Specification for specified type of respiratory equipment specific to each phase or work area.

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- .2 Provide and ensure the use of respiratory equipment appropriate for the work being performed for persons who are required to enter the Asbestos Work Area.
 - .3 Respiratory protective devices shall be certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to governing authorities.
 - .4 Maintain respiratory equipment in proper functioning and clean condition or remove from site.
 - .5 Respiratory equipment shall be identified with permanent markings with current list of persons utilizing such equipment displayed in a clean area on site.
 - .6 Filters used shall be tested following each use in accordance with manufacturer's specifications or replaced at the following minimum frequency:
 - .1 Replace cartridge filters for negative pressure respirator every 16 hours of wear unless tested on site.
 - .2 Replace PAPR cartridge filters every 8 hours of wear unless tested on site.
 - .3 Mark filters for rotation and regular replacement. Once worn in an Asbestos Work Area filters may not be removed from the project site except for disposal.
 - .7 Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .8 Store respirators, and tested filters that will be reused, in an established clean area on site. Charge batteries in this area.
- .3 Protective Clothing and Equipment
- .1 All personnel required to enter the Asbestos Work Area must use disposable full body coveralls with attached head covering. Once coveralls are worn, treat and dispose of as asbestos-contaminated waste.
 - .2 Use hard hats, safety shoes and other protective apparel required by applicable construction safety regulations.
- .4 Asbestos Abatement Work Area Entry and Exit Procedures
- .1 Refer to Section 13082 of the Specification for specified work area entry and exit procedures specific to each phase or work area.

1.13 Visitor Protection

- .1 Provide clean protective clothing, equipment and approved respirators to Authorized Visitors.
- .2 Instruct Authorized Visitors in the use of protective clothing, respirators, and Asbestos Work Area entry and exit procedures.

1.14 Signage

- .1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area. Where possible, provide signage immediately prior to entering Asbestos Work Area but out of public view. Letters on signs shall be in upper case "HELVETICA MEDIUM" and read as follows:
 - .1 CAUTION (25 mm high).
 - .2 Asbestos Hazard Area (19 mm high).
 - .3 Unauthorized Entry Prohibited (19 mm high).
 - .4 Wear Assigned Protective Equipment (19 mm high).
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm (19 mm high).
- .2 Container Signs: Label containers for the disposal of asbestos as follows:
 - .1 CAUTION CONTAINS ASBESTOS FIBRES (25 mm high).
 - .2 Do Not Mishandle (19 mm high).

1.15 Waste and Material Handling

- .1 Provide the City with a copy of each completed waste transportation manifest verifying the safe transportation of waste to an authorized disposal site. A copy of the standard form for use on this project is available through the Asbestos Abatement Consultant with a sample form having been provided for reference purposes as an appendix to the Specification.
- .2 Refer to Section 13082 of the Specification for specified waste and material handling procedures specific to each phase or work area.
- .3 Asbestos-containing or asbestos-contaminated materials removed during the work shall be treated, packaged, transported and disposed of as asbestos-contaminated waste.
- .4 Materials that could tear or puncture a 6 mil (0.15mm) polyethylene bag shall be packaged and disposed of in sealed rigid waste containers specified.

- .5 Redundant non-ACMs, rubble and debris removed during contaminated work shall be treated, packaged and disposed of as asbestos-contaminated waste. With written approval of the Asbestos Abatement Consultant, non-porous materials may be cleaned, sprayed with a sealer and disposed of as clean waste.
- .6 Waste must be transported by a hauler licensed for the transportation of waste containing asbestos by Manitoba Conservation.
- .7 Transportation of all waste and materials through Occupied Areas of the building is limited to quiet hours along predetermined routes and must be covered or placed within unmarked carts. Clean-up waste routes and loading area after each load. Use asbestos abatement precautions if appropriate or requested by the Asbestos Abatement Consultant.
- .8 Garbage bins shall be dropped at designated locations and shall remain covered and enclosed (locked) while at the building site.
- .9 Pick-up and drop off of garbage bin(s) shall be at pre-approved times, and must not interfere with building operations.

1.16 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.

1.17 Dump Monitoring

- .1 Co-operate with Manitoba Conservation inspectors and immediately carry out instructions for remedial work at dump, at no additional cost to City.
- .2 Ensure each shipment of containers is accompanied by a representative who will supervise dumping of containers and ensure all guidelines and regulations are followed.
- .3 Equip each shipment of containers with full personal protective equipment and tools required to properly clean-up spilled asbestos in the case of a failure in an Asbestos Waste Container.

2.0 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Refer to Section 13082 of the Specification 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 asbestos, asbestos debris and fibrous materials. Disposable items must be of new materials only.
- .3 **Asbestos Waste Container:** Impermeable container acceptable to Manitoba Conservation and disposal site. Labelled as required, comprised of the following:
 - .1 A sealed 6 mil (0.15 mm) polyethylene bag, inside a second 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A sealed 6 mil (0.15 mm) polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
- .4 **Bridging Encapsulant:** Bridging encapsulant for purpose of encapsulating remaining ACM at locations deemed to be inaccessible by the Asbestos Abatement Consultant. Product shall be colour coded bright red and be capable of withstanding surface temperature of substrate. Product must have flame spread and smoke development ratings both less than 50. Apply product uniformly to minimum thickness of 10 mil. Acceptable product: Serpiflex Shield or approved equal in accordance with B6.
- .5 **HEPA Vacuum:** Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.
- .6 **Lock-down Agent:** Sealant for purpose of trapping residual dust and shall be capable of withstanding surface temperature of substrate. Product must be compatible with replacement materials and must have flame spread and smoke development ratings of less than 50 and shall leave no stain when dry. Acceptable product: Serpiflex Shield or approved equal in accordance with B6.
- .7 **Negative Air Exhaust Ducting (Flexible):** Airtight tubing with metal reinforcement or approved equal. Mechanically affix each exhaust duct to the unit's exhaust with metal hose clamp. Diameter of duct to equal negative air discharge. Acceptable product: Thermalflex S-LP 10 flexible ducting as manufactured by Flexible Technologies.
- .8 **Negative Air Unit:** Portable air handling system which extracts air directly from the Asbestos Work Area and discharges air to exterior of building. Equipped as follows:

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- .1 Pre-filter 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 pre-filter.

 - .9 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.
 - .10 Protective Coveralls: Disposable full body coveralls complete with hoods. Acceptable material: Tyvek coveralls or approved equal in accordance with B6.
 - .11 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.
 - .12 Wetting Agent: Non-sudzing surface active agent. Acceptable product: Aqua-Gro or approved equal in accordance with B6.

3.0 EXECUTION

- .1 Refer to Section 13082 of the Specification for specified procedures for work area preparation, maintenance, site dismantlement, waste handling, application of lock-down agent and all other procedures for the safe handling, removal and clean-up of asbestos specific to each phase or work area.

End of Section

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1.0 GENERAL

1.1 General & 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:

Division 13, Section 13080 Asbestos Abatement – General Provisions
- .3 The intent of this Section is to provide safe work practices and procedures to govern the handling of **minor** amounts of asbestos-containing material (ACM) or surfaces which may have been or become contaminated by asbestos either during or prior to work by this Contract.

1.2 Outline of Work

- .1 Supply all labour, material, plant and equipment necessary to safely execute and complete all work of this Section while in conjunction with work specified, required or implied under Section 13080, Asbestos Abatement - General Provisions.
- .2 Isolate the Asbestos Work Area from adjoining spaces through the installation of specified hoardings, seals and enclosures at the perimeter of each phase or work area.
- .3 Remove and dispose of asbestos-containing mechanical insulation present on the generator exhaust breeching.

1.3 Inspection

- .1 The following Milestone Inspections are to take place during work of this Section:
 - .1 Milestone Inspection A - Clean Site Preparation
Inspection of preparations and set-up prior to contaminated work.
 - .2 Milestone Inspection B - Site Dismantlement
Inspection and air sampling within the Asbestos Work Area following completion of work but prior to site dismantlement.

1.4 Worker Protection Respiratory Protection

- .1 During wet removal, clean-up or repair of ACMs performed within a sealed Type 2 enclosure, supply and use full face-piece powered air purifying positive pressure dust respirators with HEPA filters.
- .2 During site dismantlement and clean-up of the Asbestos Work Area, supply and use negative pressure non-powered half-face respirators with HEPA filters.

- .3 Asbestos Abatement Work Area Entry Procedures
 - .1 Before entering Asbestos Work Area, don respirator with new or tested filters, coveralls and head covers. Protective clothing shall cover hair and any reusable clothing.
 - .2 Notwithstanding the above, and wherever an attached airlock has been provided, ensure workers reseal curtained doorway leading from out of the airlock upon entry to the Asbestos Work Area.
- .4 Asbestos Abatement Work Area Exiting Procedures
 - .1 Before leaving Asbestos Work Area, remove contamination from protective clothing and equipment using HEPA vacuum or damp cloth.
 - .2 Immediately after exiting the Asbestos Work Area complete the following:
 - .1 Notwithstanding the above, and wherever an attached airlock has been provided, ensure workers reseal curtained doorway upon exiting the Asbestos Work Area.
 - .2 Remove contaminated clothing and place it into a sealed asbestos waste container for disposal.
 - .3 Clean contaminated footwear, hard hats, etc., or place into a sealed polyethylene bag for reuse.
 - .4 Wash hands in wash bucket provided for this purpose.
 - .3 Following the above, remove respirator then proceed directly to wash area and complete the following:
 - .1 Notwithstanding the above, and wherever an attached airlock has been provided, ensure workers exit the airlock and reseal curtain doorway before removing their respirator.
 - .2 Wash exposed skin and respirator with soap and water.
 - .3 Seal inlet side of respirator filters with tape then remove filters for testing or dispose of as asbestos-contaminated waste.

1.5 Visitor Protection

- .1 Maintain one (1) emergency access kit (equipped with respirator, protective clothing, etc.) within the attached airlock for use by Contract Administrator other authorized visitors.

2.0 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Sprayer: Garden reservoir type, low velocity, capable of producing mist or fine spray.

2.2 Hoarding Walls

- .1 Walls separating an Asbestos Work Area from an Occupied Area or another work area shall be constructed as follows:
 - .4 Construct 2" x 4" (50 mm x 100 mm) wood or metal stud framework with continuous sill and top plate of sufficient strength to support polyethylene.
 - .5 Cover inside of framework with one (1) layer polyethylene. Install additional layer of rip-proof polyethylene on exterior side of framework in non-construction areas.
 - .6 Free standing enclosures must have a completely sealed polyethylene top.

2.3 Airlock

- .1 Where required to provide an attached airlock to permit movement of workers or materials between Occupied Areas and the Asbestos Work Area, construct each airlock as follows:
 - .1 Construct 2" x 4" (50 mm x 100 mm) wood or metal studs framework with continuous sill and top plate of sufficient strength to support polyethylene (minimum size 4' x 4').
 - .2 Cover inside of framework with one (1) layer of polyethylene. Install additional layer of rip-proof polyethylene on exterior side of framework in non-construction areas.
 - .3 Free standing airlocks shall have a completely sealed polyethylene top.
 - .4 Install curtained doorways at opposing ends to permit ingress or egress of workers and materials.
 - .5 Construct curtained doorways as follows:
 - .1 Place two (2) overlapping sheets of polyethylene (use rip-proof polyethylene in non-construction areas) over an existing or temporarily framed doorway.
 - .2 Secure the vertical edge of one (1) sheet along one (1) jamb of the doorway and the vertical edge of the second sheet along the opposite jamb. Then secure both sheets to the head jamb of the framed opening.

- .3 All edges of polyethylene shall be reinforced with duct tape and the bottom edge shall be weighted to ensure automatic closing. Provide directional arrows indicating opening.
- .4 All edges of polyethylene shall be reinforced with duct tape and the bottom edge shall be weighted to ensure automatic closing. Provide directional arrows indicating opening.
- .2 Where workers egress from the airlock into an Occupied Area, provide an attached change room. Construct as per hoarding walls.

3.0 EXECUTION

3.1 Site Preparation

- .1 Submit pre-removal damage survey to Asbestos Abatement Consultant.
- .2 Perform all work during scheduled times approved by the Asbestos Abatement Consultant, after shutting down HVAC systems affecting the Asbestos Work Area.
- .3 Moving of equipment, tools, supplies, and stored materials which can be performed without disturbing ACM will be performed by others.
- .4 Protect electrical and mechanical systems within work area which may be affected by work of this Section.
- .5 Isolate or otherwise disable HVAC system, vents and diffusers located within the Asbestos Work Area. System shall remain disabled until completion of work and clean-up of Asbestos Work Area.
- .6 At locations where a sealed Type 2 enclosure has been erected, provide an attached airlock to permit ingress or egress of workers and materials.
- .7 Install temporary lighting at a level so as to provide for safe and efficient use of work area - minimum 550 LUX.
- .8 Seal openings within the asbestos work enclosure using polyethylene, tape, caulking, etc., including but not limited to windows, doors, vents, diffusers, etc.
- .9 Cover floor and wall surfaces within or forming the enclosure with polyethylene sheeting. Use sufficient layers to provide adequate protection.
- .10 Install additional polyethylene and plywood so as to protect surfaces in the work area that may be damaged. Carefully protect all finishes that are scheduled to remain in place.
- .11 At locations where a sealed Type 2 enclosure has been provided, establish negative pressure within the Asbestos Work Area as follows:

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- .1 Provide a minimum of two (2) HEPA vacuums or required number of negative pressure units within each work area.
 - .2 Operate vacuums (or negative pressure units) continuously from this point until completion of site dismantlement.
 - .3 Provide additional vacuums (or negative air units) as necessary to maintain specified pressure drop and to ensure at all times air movement at perimeter of enclosure flows inward into the Asbestos Work Area.
 - .4 Distribute negative air source evenly throughout the site.
 - .5 Install and make airtight all negative air discharge ducting.
 - .6 Leak test in place using DOP method, negative pressure units which discharge directly into an Occupied space. Discharge into Occupied Areas only with written approval of the Asbestos Abatement Consultant.
 - .7 Provide weighted flaps as necessary to provide make-up air.
 - .12 Provide required tools, equipment, vacuums, materials and waste receptacles within the Asbestos Work Area.
 - .13 Post signs at perimeter of Asbestos Work Area.
 - .14 Schedule and obtain written approval of Milestone Inspection A (Clean Site Preparation) before proceeding.

3.2 Maintenance of Asbestos Work Area

- .1 Maintain Asbestos Work Area in a clean and tidy condition.
- .2 Ensure barriers and enclosures are effectively maintained. Repair damaged barriers and remedy defects immediately upon discovery.

3.3 Asbestos Removal

- .1 Seal openings to enclosure with tape following worker access. Ensure workers remain inside enclosure until work at risk of disturbing ACMs is complete and enclosure has been cleaned.
- .2 HEPA vacuum visible fallen ACM, settled dust, etc., from exposed surfaces, light fixtures, etc., throughout the Asbestos Work Area prior to and throughout the course of the work.
- .3 Scrape wetted ACM directly into waste containers. Do not allow scraped ACM to fall to the floor of the enclosure.

- .4 Remove asbestos-containing mechanical insulation from the generator exhaust breeching within the enclosure to facilitate work of this Contract in layers. Maintain exposed surfaces of insulation in a wet condition and place directly into waste receptacle.
- .5 Treat all materials removed as ACM and dispose of as such. If materials or equipment removed to access ACM are to be reused (ceiling tiles, cladding, etc.), wet clean or vacuum prior to reinstatement.
- .6 Clean surfaces from which asbestos has been removed with scouring pads, vacuuming or wet-sponging to remove all visible material after completion of removal of ACM.
- .7 Wet clean enclosure including surfaces of polyethylene, equipment, ducting, floor, etc.
- .8 Apply a heavy coat of lock-down agent to all surfaces from which ACM has been removed and to surfaces of polyethylene.
- .9 Schedule and obtain written approval of Milestone Inspection B (Site Dismantlement) before proceeding.

3.4 Site Dismantlement and Clean-up

- .1 Teardown of Sealed Type 2 Enclosures:
 - .8 Do not commence site dismantlement until authorized by the Asbestos Abatement Consultant.
 - .9 Carefully roll polyethylene towards the centre of the enclosure. As polyethylene is rolled away, immediately remove visible debris with a HEPA vacuum.
 - .10 Place polyethylene, tape, cleaning material, clothing and other contaminated waste in containers and dispose of as asbestos waste.
- .2 Clean-up:
 - .1 Equipment used in contaminated Asbestos Work Area shall be washed to remove any visible signs of asbestos contamination.
 - .2 Dismantle and remove from the area, temporary framework used to support polyethylene.
 - .3 Immediately upon shutting down of negative air units, seal air inlet grill and exhaust vent with polyethylene tape. Dispose of unit pre and intermediate filters as asbestos contaminated waste.

- .4 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.
- .5 Wash and mop with clean water all surfaces in the work area.

End of Section

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