

PART E

SPECIFICATIONS

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

- E1.1 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.1.1 *The City of Winnipeg Standard Construction Specifications* is available in Adobe Acrobat (.pdf) format on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.
- E1.1.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.1.3 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.2 The following Drawings are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing</u>
D-1	Site Plan
D-2	Aerial Photo

E2. PROTECTIVE BARRICADES

- E2.1 The Contractor shall provide and erect all protective barricades as required in accordance with the requirements of the employment safety regulations under the Workplace Safety and Health Act, Employment Safety Act and Winnipeg By-Law No. 1481/77 pertaining to erection of barricades for protection.
- E2.2 The Contractor shall be responsible for maintaining all protective barricades, including gates, walks, lights, etc. in a good operating condition for the entire period of the work to the satisfaction of the Contract Administrator.

DIVISION 13 – SPECIAL CONSTRUCTION

Section 13080	Asbestos Abatement, General Provisions
Section 13081	Asbestos Abatement, Type 1
Section 13082	Asbestos Abatement, Type 2
Section 13083	Asbestos Abatement, Type 3
Section 13084	Asbestos Abatement, Glove Bag Method
Section 13085	Packaging of PCB Ballasts
Section 13086	Guano Clean-up
Section 13087	Chemical & Miscellaneous Waste Handling
Section 13088	Aboveground Storage Tank Decommissioning

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 Supplemental and General Conditions of the Contract.
- .2 Related Work specified elsewhere:

Division 13,	Section 13081	Asbestos Abatement – Type 1
Division 13,	Section 13082	Asbestos Abatement – Type 2
Division 13,	Section 13083	Asbestos Abatement – Type 3
Division 13,	Section 13084	Asbestos Abatement – Glove Bag Method
Division 13,	Section 13085	Packaging of PCB Ballasts
Division 13,	Section 13086	Guano Clean-up
Division 13,	Section 13087	Chemical and Miscellaneous Waste Handling
Division 13,	Section 13088	Aboveground Storage Tank Decommissioning
- .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 bid opportunity closing.
- .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(s) 13081, 13082, 13083, and 13084 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 Visit the Site prior to bid opportunity closing to confirm the location and extent of any asbestos-containing or asbestos-contaminated materials.
- .3 Provide temporary utilities including water and electricity to facilitate asbestos removal.
- .4 Isolate the Asbestos Work Area from adjoining Non-Occupied Areas whether present at an interior or exterior location.
- .5 Remove and dispose of as asbestos-containing waste, building components, materials and items contaminated by asbestos that cannot be effectively cleaned.
- .6 Final clean Work Area to remove visible signs of asbestos, other debris or settled dust.

- .7 Apply lock-down agent to exposed surfaces throughout the Work Area and to surfaces from which any asbestos had been removed.
- .8 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 Pipewrap insulation present on straight runs and fittings of mechanical services located on the Main and 2nd Floors of the 11 storey Elevator Building, the Boiler House, and the tunnel leading from the Boiler House under Higgins Avenue, is known to contain Chrysotile asbestos.
- .2 Pipe insulation debris present throughout the Boiler House and on the 2nd Floor of the 11 storey Elevator Building is known to contain Chrysotile asbestos.
- .3 Mechanical insulation present on the following equipment is known to contain Chrysotile asbestos:
 - .1 Hot water storage tank located in the northeast Basement of the Boiler House.
 - .2 Tops of the north and south boilers in the Boiler House.
 - .3 Around the access doors on the south side of the north Boiler.
 - .4 On two (2) unidentified ducts located on the south half of the Main Floor of the 11 storey Elevator Building.
- .4 Asbestos cement panel cladding is present on the walkway/conveyor from the Grain Silos to the 11 storey Elevator Building.
- .5 Asbestos cement panel and debris is present on the walls surrounding the shelves in the northwest corner of the 11 storey Elevator Building, inside an unidentified duct on the north side of the 2nd Floor of the Elevator Building, and along the Main Floor west wall of the Elevator Building on the interior (Main Floor) and exterior of the building.
- .6 Asbestos gaskets are present in and around the shelves of the northwest room of the Boiler House.
- .7 Immediately stop Work in the area and notify the Contract Administrator 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.
- .8 All utilities on Site including power, water, and sewer have been disconnected.
- .9 Bird feces/guano is present on all surfaces throughout the Boiler House and Main and 2nd Floors of the Elevator Building.

- .10 Building hazards including floor openings, missing guard rails, and potential for falling debris exist on Site.

1.4 **Schedule**

- .1 Perform Work during following period:
- .2 Work Hours:
 - .1 Normal Work Hours: 08:00 through 17:00 (Mon. - Fri.).
 - .2 Quiet Hours: As directed by the Contract Administrator.
- .3 Provide necessary manpower, supervision, equipment and materials to maintain and complete the project on schedule.
- .4 Provide 48 hours written notice to the Contract Administrator of any request to Work outside normal working hours. Obtain written approval before proceeding.

1.5 **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: Contract Administrator, 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 Contract Administrator or his representative.
- .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 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.
- .10 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.

- .11 Glove Bag: Prefabricated bag which provides a completely sealed envelope surrounding a given section of piping to permit the removal of asbestos-containing insulation from within the bag while maintaining the integrity of the bag and preventing the spread of airborne asbestos fibres.
- .12 HEPA Filter: High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.
- .13 Milestone Inspection: Inspection of the Asbestos Work Area at a defined point in the abatement operation.
- .14 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 Contract Administrator or his representative.
- .15 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure. Including but not limited to the following ACM: vinyl tiles, asbestos cement tiles, gaskets, seals, select packings, friction products, drywall joint compound and asbestos cement products. Exclude from the above categorization, any material that is or may become crumbled, pulverized or powdered by handling as described herein.
- .16 Occupied Area: Any area of the building or adjoining space outside the Asbestos Work Area.
- .17 Pipewrap: Any thermal or vapour covering present on straight runs and/or fittings of mechanical services. Include with the above, metal or other rigid jacketing associated straps, ties, fastenings, etc.
- .18 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.

1.6 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.

1.7 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.

1.8 Inspection

- .1 From commencement of Work until completion of clean-up operations, the Contract Administrator or his representative is empowered 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 Contract Administrator or his representative is empowered 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 City.
- .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 City.
- .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 City.
- .7 Refer to Section(s) 13081, 13082, 13083 and 13084 of the Specification 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 Contract Administrator or his representative of any request for scheduling of milestone inspections.
- .9 Do not proceed with next phase of Work until written approval of each milestone is received from the Contract Administrator or his representative.

1.9 Air Monitoring

- .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 of 0.05 fibres per millilitre of air (fibre/mL) or greater, outside an Asbestos Work Area, or from within the Asbestos Work Area during or following Glove Bag Work, 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 Contract Administrator or his representative.
 - .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 visual inspection and air monitoring results are at a level equal to that specified.
 - .4 At the discretion of the Contract Administrator or his representative, 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 in excess of 0.01 fibres per millilitre of air (fibre/mL), collected within the 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.
- .5 Where results of PCM sampling exceed 5.0 fibre/mL within a Type 2 Asbestos Work Area or 20.0 fibre/mL within a Type 3 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 Contract Administrator or his representative.
 - .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.
- .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 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.

1.10 Supervision

- .1 In addition to any requirements for Contractor's Supervisor identified in Section D4 – Contractor's Supervisor, the asbestos abatement Contractor's Supervisor will require the following:
 - .1 Provide on Site, in addition to the Contractor's Supervisor, and 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 Contractor's 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 City.
 - .4 Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the Contract Administrator. The Contract Administrator reserves the right to request replacement of supervisory personnel without explanation.
 - .5 Do not replace supervisory personnel without written approval from the Contract Administrator.

1.11 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.

1.12 Submittals

- .1 Submit prior to starting Work:
 - .1 Proof of required licensing for transportation of asbestos waste.

- .2 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.
- .3 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.
- .4 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.
 - .4 Rip-proof polyethylene.
 - .5 Polyurethane foam.
 - .6 Chemicals or materials used in the course of asbestos abatement.
- .5 Negative air unit performance data and results of DOP tests as required.
- .6 Proof that all employees have been fit-tested for the respirator appropriate for the Work being performed.
- .7 Proof that all employees have had instruction on hazards of asbestos exposure, use of respirator and all aspects of work procedures and protective measures.
- .8 Proof that all employees are listed on an asbestos work report and have been given required medical examinations.
- .9 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.

1.13 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(s) 13081, 13082, 13083 and 13084 of the Specification for specified type of respiratory equipment specific to each phase or Work Area.
- .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(s) 13081, 13082, 13083 and 13084 of the Specification for specified Work Area entry and exit procedures specific to each phase or Work Area.

1.14 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.

1.15 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).

1.16 Waste and Material Handling

- .1 Provide the Contract Administrator with a copy of each completed waste transportation manifest verifying the safe transportation of waste to an authorized disposal site.
- .2 Refer to Section(s) 13081, 13082, 13083 and 13084 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 Contract Administrator or his representative, non-porous materials may be cleaned, sprayed with a sealer and left behind for final disposal by the demolition contractor as clean waste.

- .6 Waste must be transported by a hauler licensed for the transportation of waste containing asbestos by Manitoba Conservation.
- .7 Garbage bins shall be dropped at designated locations and shall remain covered and enclosed (locked) while at the building Site.

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 the 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(s) 13081, 13082, 13083 and 13084 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 or glove bag, inside a second 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A sealed 6 mil (0.15 mm) polyethylene bag or glove 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 Contract Administrator or his representative. 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.
- .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.
- .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:
 - .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.
- .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 Shower Hose: Water lines for supply of hot and 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. Acceptable Product: No. 71-92 Daco; as available from MacMor Industries, Winnipeg, Manitoba.
- .13 Wetting Agent: Non-sudzing surface active agent. Acceptable product: Aqua-Gro or approved equal.

3.0 EXECUTION

- .1 Refer to Section(s) 13081, 13082, 13083 and 13084 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

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 Supplemental and General Conditions of the Contract.
- .2 Related Work 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, removal and disposal of non-friable asbestos-containing materials (ACMs) to be disturbed by Work of 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 placement of specified barriers and partitions at the perimeter of each phase or Work Area.
- .3 Remove and dispose of asbestos cement panels at locations specified under Section 13080, 1.3 Site Conditions. Exclude from removal asbestos cement panel cladding present on the walkway/conveyor from the Grain Silos to the 11 storey Elevator Building.
- .4 Remove and dispose of all asbestos gaskets at locations specified under Section 13080, 1.3 Site Conditions.
- .5 Protect surfaces throughout the Work Area and prevent the spread of dust, by use of polyethylene drop sheets or other suitable materials.

1.3 Inspection

- .1 The following Milestone Inspections are to take place during Work of this Section:
 - .1 Milestone Inspection A - Site Dismantlement
Inspection within the Asbestos Work Area following completion of Work but prior to site dismantlement.

1.4 Worker Protection

- .1 Provide, if requested by worker(s), protective coveralls and non-powered half-face respirators with high efficiency (HEPA) cartridge filters. Respirators and protective coveralls are not mandatory for Work with non-friable ACMs.
- .2 Provide facilities for washing of hands and face to the worker(s) which shall be used by every worker when leaving the Asbestos Work Area.

2.0 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Sprayer: Garden-type portable manual sprayer or water hose with spray attachment.
- .2 Prohibit the use of power tools that are not equipped with HEPA filtered dust collection device. Immediately cease the use of such power tools if any visible dust escapes from HEPA filtered dust collection device.

3.0 EXECUTION

3.1 Site Preparation

- .1 Proceed with selective demolition of mechanical and electrical equipment, building components, materials and items scheduled for demolition at locations required to facilitate access to concealed ACMs.
- .2 Ensure any non-asbestos debris or rubble generated during this selective demolition is removed from the immediate area prior to commencement of any asbestos removal.
- .3 This Section shall remain responsible for the clean-up and disposal of all debris or rubble not able to be successfully segregated from asbestos-containing or asbestos-contaminated materials during the selective demolition as completed by this Section.
- .4 Segregate Asbestos Work Area and parts of building required to remain in use by closing doors, placing of barricades or tape barrier, etc.
- .5 Provide tools, equipment, vacuum, materials and waste receptors within the Asbestos Work Area.
- .6 Post signs in all areas where access to the Asbestos Work Area is possible.
- .7 HEPA vacuum or wet wipe dust from surfaces within the Asbestos Work Area.
- .8 Cover floor and furnishings in the vicinity of the Work with polyethylene before disturbing non-friable asbestos materials other than floor tiles.
- .9 Do not commence contaminated Work until authorized by the Contract Administrator or his representative.

3.2 Removal of Asbestos Cement Panelling

- .1 Wet, where possible, all material to be disturbed.
- .2 Undo fasteners, if necessary, to remove material. Break material only if unavoidable.
- .3 Wet freshly exposed edges of broken materials.
- .4 Wet material and use hand scraping to remove adhering material where sections are adhered to substrate.

- .5 Place removed material into asbestos waste container.
- .6 Clean Asbestos Work Area frequently and again at completion of Work with HEPA vacuum or with wet methods.
- .7 At completion of Work, clean drop sheets to be reused with HEPA vacuum or wet methods.
- .8 Dispose of, as asbestos waste, drop sheets not cleaned.
- .9 Proceed with the dismantlement of all barricades, etc., following receipt of authorization to proceed from the Contract Administrator or his representative.
- .10 Schedule and obtain written approval of Milestone Inspection A (Site Dismantlement) before proceeding with the removal of perimeter barricades, etc.

End of Section

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 Supplemental and 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 at locations outside a prepared Type 3 enclosure.
- .4 Refer to related sections of the Specification for specified personnel protective measures and procedures for Work of this Section performed while within a prepared Type 3 enclosure.

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 minor amounts of asbestos-containing mechanical insulation present on the (two) unidentified ducts in the south half of the Main Floor of the Elevator Building.
- .4 Remove and dispose of minor amounts of asbestos-containing pipe insulation and debris on the 2nd Floor of the Elevator Building. The pipe insulation removal on the 2nd Floor will not require an enclosure, but workers must complete the removal following Type 2 procedures, including full personal protective equipment specified under this section.

1.3 Inspection

- .1 The following Milestone Inspections are to take place during Work of this Section:
 - .1 Milestone Inspection A - Site Dismantlement
Inspection and air sampling within the Asbestos Work Area following completion of Work but prior to Site dismantlement.

1.4 Worker Protection

.1 Respiratory Protection

- .1 During wet removal and clean-up 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.

.2 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.

.3 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.

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:
 - .1 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.
 - .2 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.
 - .3 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.

3.0 EXECUTION

3.1 Site Preparation

- .1 Moving of equipment, tools, supplies, and stored materials which can be performed without disturbing ACM will be performed by others.
- .2 Where access within a contaminated space or where removal and clean-up of minor amounts of ACMs is to be performed, erect hoarding walls at locations required to isolate the Asbestos Work Area from Occupied Areas.
- .3 Notwithstanding the above, and at locations specified under Section 1.2 Outline of Work, Item .4, segregation of the Asbestos Work Area may be provided by closing doors, placing of barricades or tape barriers, etc.
- .4 At locations where a sealed Type 2 enclosure has been erected, provide an attached airlock to permit ingress or egress of workers and materials.
- .5 Install temporary lighting at a level so as to provide for safe and efficient use of Work Area - minimum 550 LUX.
- .6 Seal openings within the asbestos work enclosure using polyethylene, tape, caulking, etc., including but not limited to windows, doors, vents, diffusers, etc.
- .7 Cover wall surfaces within or forming the enclosure with polyethylene sheeting. Use sufficient layers to provide adequate protection.
- .8 At locations where a sealed Type 2 enclosure has been provided, establish negative pressure within the Asbestos Work Area as follows:
 - .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 Contract Administrator or his representative.
 - .7 Provide weighted flaps as necessary to provide make-up air.

- .9 Provide required tools, equipment, vacuums, materials and waste receptacles within the Asbestos Work Area.
- .10 Post signs at perimeter of Asbestos Work Area.
- .11 Do not commence contaminated Work until authorized by the Contract Administrator or his representative.

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 and Clean-up

- .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 minor amounts of asbestos-containing mechanical insulation from systems or services 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.
- .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 A (Site Dismantlement) before proceeding.

3.4 Site Dismantlement and Clean-up

.1 Teardown of Sealed Type 2 Enclosures:

- .1 Do not commence Site dismantlement until authorized by the Contract Administrator or his representative.
- .2 Carefully roll polyethylene towards the centre of the enclosure. As polyethylene is rolled away, immediately remove visible debris with a HEPA vacuum.
- .3 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

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 Supplemental and General Conditions of the Contract.
- .2 Related work 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 asbestos-containing materials (ACM) and all other surfaces or materials which may have been or become contaminated by asbestos either during or prior to Work of this contract were present at locations within a prepared Type 3 enclosure.

1.2 Outline of Work

- .1 Supply all labour, material, plant and equipment necessary to safely execute and complete 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 Construct worker and waste decontamination facilities at the perimeter of each phase or Work Area.
- .4 Remove and dispose of asbestos-containing pipewrap insulation on straight runs and fittings of mechanical services present within a Type 3 enclosure at locations identified under Section 13080, Paragraph 1.3 Site Conditions. Include fallen or dislodged debris and material present throughout the Work Area.
- .5 Remove and dispose of mechanical insulation on tanks and boilers, at locations identified under Section 13080, Paragraph 1.3 Site Conditions. Include fallen or dislodged debris and material present throughout the Work Area.
- .6 Handling, removal, and clean-up of asbestos-containing materials or surfaces contaminated with asbestos is to be performed following wet removal techniques.

1.3 Inspection

- .1 The following Milestone Inspections are to take place during the Work:
 - .1 Milestone Inspection A - Clean Site Preparation
Inspection of site preparations and set-up prior to contaminated work.
 - .2 Milestone Inspection B - Visual Clearance
Inspection of the Asbestos Work Area after removal of asbestos, but prior to application of lock-down agent.

- .3 Milestone Inspection C - Air Monitoring Clearance
Inspection & air monitoring after application of lock-down agent, but prior to removal of polyethylene from within the Asbestos Work Area.

1.4 Worker Protection

.1 Respiratory Protection

- .1 During wet removal and cleaning of asbestos-containing or contaminated materials within a Type 3 enclosure, supply and use at a minimum, full face-piece powered air purifying positive pressure dust respirators with HEPA filters.
- .2 During dry removal, or if fibre level within the work enclosure exceeds permissible levels for use of PAPR during wet removal, supply and use Type C, pressure demand supplied air respirators with full face-piece and egress filters. Ensure workers exiting the enclosure do not disconnect their respirators from supply air hose until they have entered the shower stall.
- .3 During Site teardown, supply and use negative pressure non-powered half-face respirators equipped with HEPA cartridge filters.

.2 Asbestos Abatement Work Area Entry Procedures

- .1 Remove street clothes in Clean Change Room.
- .2 Put on respirator with new or tested filters, coveralls, and head covers in Clean Change Room or clean side of Shower Room.
- .3 Store street clothes, uncontaminated footwear, towels, etc. in Clean Change Room.

.3 Asbestos Abatement Work Area Exit Procedures

- .1 Remove gross contamination from protective clothing using a HEPA vacuum or by wet wiping.
- .2 Proceed to Equipment and Access Room and remove all contaminated clothing and equipment except respirator.
- .3 Store contaminated footwear, hard hats, etc. in Equipment and Access Room.
- .4 Proceed naked to showers while still wearing respirator.
- .5 Shower, cleaning outside of respirator with soap and water. Thoroughly wet body, head and hair, remove respirator and wash body, head and hair. Wet clean inside of respirator face-piece.
- .6 Remove filters for testing or dispose of in container provided for this purpose on the clean side of the shower. Store respirators in this area after leaving the Shower but prior to entering the Clean Change Room.
- .7 Proceed to the Clean Change Room, dry off and dress in street clothing.

1.5 Visitor Protection

- .1 Maintain one (1) emergency access kit (equipped with respirator, protective clothing, etc.) at each access point to Asbestos Work Area for use by Contract Administrator or authorized visitors.

2.0 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Ground Fault Panel: Electrical panel equipped 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.
- .2 Sprayer: Airless sprayer capable of providing a fine mist or spray while maintaining sufficient velocity to penetrate surface of ACM through to substrate without blowing loose the material as it is being wetted.

2.2 Hoarding Walls

- .1 Walls separating an Asbestos Work Area from an Occupied Area or another work area shall be constructed as follows:
 - .1 Lower Perimeter Hoarding Walls: 2" x 4" (50 mm x 100 mm) wood or metal studs at 16" (400 mm) o/c with continuous sill and top plate, covered with one (1) layer of polyethylene sheeting on each side of wall. Use rip-proof polyethylene at locations where exposed to non-construction areas.
 - .2 Upper Perimeter Hoarding Wall: 2" x 4" (50 mm x 100 mm) wood or metal studs at 16" (400 mm) o/c with continuous sill and top plate, covered with two (2) layers of polyethylene sheeting on Work Area side. Use rip-proof polyethylene at locations where exposed to non-construction areas.

2.3 Decontamination Facilities

- .1 Workers' Decontamination Facility

A decontamination facility comprised of four (4) linked rooms, an Equipment and Access Room, a Shower Room, a Respirator Storage Room, and a Clean Change Room. Rooms, Occupied Areas and Asbestos Work Areas, shall be separated by curtained doorways at each door.

- .2 Equipment and Access Room: Room between Shower Room and Asbestos Work Area. Minimum requirements as follows:
 - .1 Waste receptor for contaminated clothing or equipment not to be reused.
 - .2 Storage facilities for any personal protective equipment to be reused in Asbestos Work Areas.
 - .3 Minimum size of 16 square feet (1.5 square metres).
- .3 Shower Room: Room between Respirator Storage Room and Equipment and Access Room. Minimum requirements as follows:
 - .1 One walk-through shower unit for every six (6) workers.
 - .2 Provide a 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°C (maximum 50° C) in a volume required for all workers to properly decontaminate.
 - .3 Terminate water supply runs at individual hot and cold shut-off valves located on clean side of Shower Room. Connect shower to these valves.
 - .4 Provide sump pumps, sufficient for volume of waste water being discharged from showers and drip pans. Direct waste shower water to sanitary sewer drains.
 - .5 Provide power switch adjacent to each shower for operating sump pumps.
 - .6 Provide soap, shampoo and clean towels to workers and authorized visitors.
- .4 Respirator Storage Room: Room between the Shower Room and the Clean Room. Minimum requirements as follows:
 - .1 Install ground faulted power supply, hooks and shelves on clean side of shower for storage of respirators and recharging of batteries as required.
 - .2 Provide 6 mil poly waste container for disposal of respirator cartridge filters.
 - .3 Minimum room size of 16 square feet (1.5 square metres).
- .5 Clean Room: Room between the Respirator Storage Room and Occupied Areas. Minimum requirements as follows:
 - .1 Provide lockers or hangers for workers' street clothes and personal belongings.
 - .2 Provide and install temporary water heater for showers where required.
 - .3 Minimum size of 16 square feet (1.5 square metres).

.6 Waste and Equipment Decontamination Facility

Waste and Equipment Decontamination Facility comprised of three (3) linked rooms: a Container Cleaning Room, a Holding Room and a Transfer Room. Purpose of this system is to provide a means to decontaminate drums, scaffolding, asbestos waste containers, vacuum, spray equipment, other tools, equipment and materials required in the Asbestos Work Area. Rooms, Occupied Areas and Asbestos Work Areas, shall be separated by curtained doorways at each door.

.7 Container Cleaning Room: Room between Asbestos 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. Minimum size of 16 square feet (1.5 square metres).

.8 Holding Room: Room between Container Cleaning Room and Transfer Room, of sufficient size to accommodate at least two (2) rigid waste containers or largest item of equipment used. Minimum size of 16 square feet (1.5 square metres).

.9 Transfer Room: Room between Holding Room and Occupied Area, acting as an air lock for the transfer of waste. At doorway to Occupied Area, provide and install a vented wood door in wood frame. Door must have locking passage set or hasp and lock. Provide three (3) keys to the Contract Administrator or his representative. Minimum size of 16 square feet (1.5 square metres).

.10 Construction of Decontamination Facilities

.1 Floor:

- .1 Lay one (1) sheet of rip-proof polyethylene over floor area that will be covered by decontamination facility prior to erecting wall framing.
- .2 Turn 24" (600 mm) of rip-proof polyethylene up the outside of the decontamination facility and overlap with the polyethylene sheeting covering the exterior perimeter wall.
- .3 In the Container Clean Room, Equipment and Access Room, Holding Room, Transfer Room, Respirator Storage Room, and Clean Room, cover floor with a second layer of rip-proof polyethylene overlapped and sealed to the polyethylene sheeting on the walls.
- .4 In Shower Room, provide a 40" (1000 mm) wide x 108" (2700 mm) long x 6" (150 mm) deep sealed drip pan below shower stall and extending 36" (900 mm) into Shower Room on both sides of the shower stall. Install a wooden duck-board walking surface over drip pan on both sides of the shower stall.

.2 Perimeter Walls:

- .1 2" x 4" (50 mm x 100 mm) wood framing at 16" (400 mm) o/c with continuous top and sill plates.
- .2 Cover each side of framing with one (1) layer of polyethylene sheeting.
- .3 Use rip-proof polyethylene at locations exposed to non-construction areas.

.3 Interior Walls:

- .1 Construct walls to separate the rooms of the decontamination facilities using 2" X 4" (50 mm x 100 mm) wood framing at 24" (600 mm) o/c with continuous top and sill plates.
- .2 Cover walls with one (1) layer of polyethylene sheeting on each side.

.4 Roof:

- .1 Size of joists is to be determined by span. For spans up to 10 feet (3.3 meters) use as a minimum 2" x 6" (50 mm x 150 mm) wood joist at 16" (400 mm) o/c with continuous 2" x 6" (50 mm x 150 mm) headers.
- .2 Where roof is exposed to the Asbestos Work Area, cover joists with 3/4" (20 mm) plywood sheeting, caulked and taped at all joints. Cover plywood with two (2) layers of rip-proof polyethylene. One (1) layer to extend continuously over rip-proof polyethylene on the perimeter walls.
- .3 Where roof is exposed to the Occupied Area, install a layer of polyethylene directly over joists. Use rip-proof polyethylene at locations exposed to non-construction areas.
- .4 At underside of joist install one (1) layer of polyethylene.
- .5 Minimum interior clear height 6' - 6" (2.0 m) to underside of joist.

.5 Curtained Doorway:

- .1 Install two (2) flap doors, full width and height of door opening at all doors between chambers, facilities and Asbestos Work Area.
- .2 Construct each flap door of two (2) layers of rip-proof polyethylene sheeting with all edges tape reinforced. Use wood strapping to securely fasten flap doors to head and alternate jambs.
- .3 Weight each flap to ensure automatic closure.
- .4 Provide direction arrows on flaps to indicate opening.

3.0 EXECUTION

3.1 Clean Site Preparation

- .1 Moving of equipment, tools, supplies, and stored materials which can be performed without disturbing asbestos-containing materials will be performed by others.
- .2 Erect hoarding walls between Asbestos Work Area and Occupied Areas.
- .3 Pre-clean all surfaces using HEPA vacuum or damp cloth prior to installing protection.
- .4 Erect Worker and Waste decontamination facilities at locations approved by the Contract Administrator or his representative.

- .5 Provide one (1) specified ground fault electrical panel for each 1,000 square feet (300 square metres) of Asbestos Work Area. All electrical apparatus including temporary heating equipment shall be supplied from a ground fault system. Ensure safe installation of electrical lines and equipment by skilled tradesmen.
- .6 Install temporary lighting in all Work Areas at levels that will provide for a safe and efficient use of the Work Area - minimum 550 LUX.
- .7 Establish negative pressure within the Asbestos Work Areas as follows:
 - .1 Provide negative air units in place sufficient to maintain specified air flow and pressure differential between contaminated Asbestos Work Area and Occupied Areas.
 - .2 Distribute negative air units evenly throughout Site.
 - .3 Provide weighted flaps in perimeter seal to provide make-up air.
 - .4 Operate negative pressure units continuously from completion of Clean Site Preparation until start of final dismantlement.
 - .5 Replace pre-filters frequently to maintain specified flow.
 - .6 Replace HEPA filter as required to maintain flow rate and integrity of unit.
 - .7 Install and make airtight all negative air discharge ducting.
- .8 Install negative air discharge panels as follows:
 - .1 Remove existing windows or doorways where necessary and replace with a 3/4 inch (18 mm) plywood panel.
 - .2 Install panel securely in window or door frame and make weather-tight with caulking.
 - .3 For each negative pressure unit, provide a 12" (300 mm) diameter, screened, duct opening through panel.
- .9 Independently seal below ceiling openings to Work Area using polyethylene, tape, caulking, polyurethane foam etc., including but not limited to windows, doors, vents, diffusers, etc..
- .10 Seal openings in floor using plugs, tape, caulking, rip-proof polyethylene, etc
- .11 Maintain emergency and fire exits from Asbestos 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 so as to clearly mark exit route. Seal emergency exit door so as not to impede use of door during emergency evacuation.

- .12 Install ½ inch plywood and one (1) layer of rip proof polyethylene on exterior windows, doors, and wall openings.
- .13 Floor and wall surfaces within the Boiler House will not require polyethylene protection.
- .14 For hoarding walls exposed to the Asbestos Work Area; install polyethylene as specified in Paragraph 2.2 - Hoarding Walls.
- .15 Stagger or offset seams of polyethylene wherever multiple layers are used and ensure each layer is independently sealed.
- .16 Provide required tools, equipment, vacuums and asbestos waste receptacles within the Asbestos Work Area.
- .17 Post required signs at all access points to the sealed Asbestos Work Area.
- .18 Schedule and obtain written approval of Milestone A (Clean Site Preparation) before proceeding.

3.2 Maintenance of Contaminated Asbestos Work Area

- .1 Maintain enclosures in tidy condition and free of dislodged asbestos or other debris.
- .2 Ensure Asbestos Abatement Work Area enclosures, barriers, and polyethylene linings are effectively sealed and taped. Repair damage and remedy defects immediately.
- .3 Visually inspect enclosures at beginning and end of each working period. Inspection must be performed by Contractor's Supervisor or Shift Superintendent.
- .4 Inspect negative air units including discharge ducting at beginning and end of shift.

3.3 Maintenance of Decontamination Facilities

- .1 Maintain access to decontamination facilities in a locked state when not being used for worker access, egress, or waste and equipment movement.
- .2 Maintain and clean decontamination facilities at the following frequency:
 - .1 Thoroughly clean Worker Decontamination Facility at beginning and end of each shift change.
 - .2 Clean Equipment and Waste Facility on a frequent basis during waste or equipment removal and at the completion of each shift.
- .3 Visually inspect decontamination facilities at beginning and end of each working shift. Inspection must be performed by Contractor's Supervisor or Shift Superintendent.

3.4 Wet Removal of Asbestos

- .1 Proceed with selective demolition of mechanical and electrical equipment, building components, materials and items scheduled for demolition at locations required to facilitate access to concealed asbestos-containing materials.
- .2 Ensure any non-asbestos debris or rubble generated during this selective demolition is removed from the immediate area prior to commencement of any asbestos removal.
- .3 The demolition contractor shall remain responsible for the disposal of non-asbestos debris and rubble able to be segregated from asbestos-containing or contaminated materials during selective demolition as performed by this Section.
- .4 This Section shall remain responsible for the clean-up and disposal of all debris or rubble not able to be successfully segregated from asbestos-containing or asbestos-contaminated materials during the selective demolition as completed by this Section.
- .5 As Work progresses, lightly mist with amended water, pick-up and dispose of all visible fallen or dislodged asbestos-containing or asbestos-contaminated debris throughout the Work Area.
- .6 Provide a drop-sheet in the immediate area of active removal. Drop sheet is to consist of rip-proof polyethylene sized accordingly to catch any debris during removal - minimum width 5 feet.
- .7 Proceed with removal of pipewrap while maintaining exposed surfaces of insulation or lagging in a wet condition. Where necessary puncture surface of insulation to thoroughly saturate asbestos.
- .8 Remove saturated asbestos material in sections and place immediately into waste receptacle. Maintain drop-sheet free of any debris during the Work process.
- .9 All dislodged debris and fibres shall be maintained in wet state and placed in waste containers for disposal as Work progresses and at the end of each shift.
- .10 Repeatedly mist the air throughout the performance of this Work while maintaining surfaces within the Asbestos Work Area in a damp state.
- .11 Following completion of gross asbestos removal Work, perform the following:
 - .1 Wet clean all surfaces from which asbestos has been removed with stiff bristle brushes, vacuums, wet-sponges etc. to remove visible residue and fibrous materials.
 - .2 Wet clean all other surfaces in the Asbestos Work Area, including the decontamination facilities, equipment, surfaces of polyethylene sheeting, floor and walls surfaces, ducts and similar items not covered with polyethylene sheeting.
 - .3 Remove all wash water as contaminated waste.

- .12 Repeat final cleaning procedures until the Work Area is at a standard of cleanliness acceptable to the Contract Administrator or his representative.
- .13 As Work progresses, and at regular intervals, transport sealed and labelled asbestos waste containers from the Asbestos Work Area to an authorized waste disposal site.
- .14 Remove and dispose of as asbestos-contaminated waste the pre-filters from all negative air units.
- .15 Schedule and obtain written approval of Milestone Inspection B (Visual Clearance) before proceeding.

3.5 Waste and Material Handling

- .1 Removal of waste containers and decontaminated equipment and materials from the Asbestos Work Area shall be performed using the waste decontamination facility as follows:
 - .1 Prior to entering the waste decontamination facility Container Cleaning Room, the first worker (fully protected inside the Asbestos Work Area) shall remove any visible gross asbestos contamination from the surface of the item being removed from the Asbestos Work Area.
 - .2 The first worker then passes the item to a second worker located in the Container Cleaning Room. The second worker then wet sponges, cleans, double bags and/or wraps and seals the item prior to passing the item through the curtained doorway to a third worker in the Holding Room. (The second and third worker shall be fully protected with respirator and disposable clothing and may only leave the decontamination facility via the Asbestos Work Area.)
 - .3 Without entering the Transfer Room, the third worker then passes the item through the curtained doorway to a fourth worker located within the Transfer Room.
 - .4 The fourth worker then removes the item from the Transfer Room and transports it to the disposal bin. (The fourth worker must never enter the Holding Room.)

3.6 Application of Lock-down Agent

- .1 Obtain the Contract Administrator or his representative's written authorization to proceed prior to applying lock-down agent.
- .2 Paint surfaces from which asbestos-containing material has been removed with a heavy coat (two (2) passes) of lock-down agent.
- .3 Apply one (1) coat of lock-down agent as required to cover all other surfaces in the Asbestos Work Area, including all polyethylene and surfaces scheduled for demolition.
- .4 Restrict access to Asbestos Work Area and operate negative air units for a 12 hour period prior to Milestone Inspection C (Air Monitoring Clearance).

- .5 Schedule and obtain written approval of Milestone C (Air Monitoring Clearance) before proceeding.

3.7 Asbestos Work Area Teardown and Dismantling

.1 Teardown

- .1 Maintain hoardings, decontamination facilities and negative air unit(s) fully functional during teardown and removal of asbestos contaminated polyethylene, tape, etc.
- .2 Ensure use of half-face respirators with high efficiency filters and disposable clothing, during teardown and removal of asbestos contaminated polyethylene, tape, foam pack, caulking and enclosures from Asbestos Work Area.
- .3 Phase the removal of polyethylene, tape, polyurethane foam, caulking and enclosures from the Asbestos Work Area so as to maintain perimeter isolation as long as possible.
- .4 Visible fibres or residue found during removal of polyethylene shall be immediately removed using a HEPA vacuum or damp cloth.
- .5 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 asbestos contamination, or double-bagged for transportation prior to being removed from Asbestos Work Areas, via waste and equipment decontamination facility.
- .2 Seal vacuum, hoses and fittings, and all tools used in contaminated Work Site in 6 mil polyethylene bags prior to removal from Work Area.
- .3 Clean-up Asbestos Work Area, decontamination chambers, and all other surfaces that may be contaminated. Remove polyethylene protection from floor surfaces within the decontamination chambers at this time.
- .4 Wash and mop with clean water all surfaces in the Asbestos Work Area.

.3 Dismantling

- .1 Hoarding walls, platforms, scaffolding, tunnels, etc., used to separate Occupied Areas from Asbestos Work Area, are to remain in place until completion of Work in the area by other trades or until authorized to be removed by the Contract Administrator or his representative.
- .2 Remove from the area decontamination facilities, temporary lights, ground fault panels, negative pressure units and all other equipment located within the Work Area not scheduled to remain.

- .3 Immediately upon shutting down negative air units, seal air inlet grill, ducting and exhaust vent with polyethylene tape. Dispose of unit pre and intermediate filters as asbestos contaminated waste.

- .4 Damp mop and clean Occupied Areas following completion of dismantlement.

End of Section

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 Supplemental and General Conditions of the Contract.
- .2 Requirements specified elsewhere:

Division 2, Section 13080 Asbestos Abatement – General Provisions
- .3 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 pipewrap insulation performed by Glove Bag Method at locations outside a prepared Type 3 enclosure.

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 placement of specified barriers and partitions at the perimeter of each phase or Work Area.
- .3 Remove and dispose of asbestos pipewrap insulation on straight runs and fittings of mechanical services located throughout all areas of Work where present at locations outside a prepared Type 3 enclosure. Exclude the removal of pipewrap insulation visibly determined to be fibreglass insulation which is free of asbestos contamination.
- .4 Notwithstanding the above, complete the removal of pipewrap insulation within a temporary enclosure as specified under Section 13082, Asbestos Abatement - Type 2 at locations where removal following the Glove Bag Method can not be completed safely. The Contract Administrator or his representative shall determine on site which method is to be followed.

1.3 Inspection

- .1 The following Milestone Inspections are to take place during Work of this Section:
 - .1 Milestone Inspection A - Site Dismantlement
Inspection of Work Area at completion of Work, but prior to site dismantlement.

1.4 Worker Protection

- .1 Respiratory Protection
 - .1 During installation, use, or removal of a glove bag, or while within a Glove Bag Work Area; use negative pressure non-powered half-face respirators equipped with high efficiency (HEPA) cartridge filters.

.2 Asbestos Abatement Work Area Entry & Exit Procedures

- .1 Before entering the Asbestos Work Area, don respirator with new or tested filters, coveralls and hood. Protective clothing shall cover hair and re-usable clothing.
- .2 Before leaving Asbestos Work Area remove gross contamination from protective clothing using HEPA vacuum, then remove all contaminated clothing and equipment except respirator.
- .3 Clean contaminated footwear, hard hats, etc., or place in sealed polyethylene bag ready for reuse.
- .4 Exit Work Area before removing respirator then proceed directly to wash area and complete the following:
 - .1 Wash exposed skin and respirator with soap and water.
 - .2 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 Protective equipment shall be required by authorized visitors only where glove bag is ripped, cut or otherwise opened.

2.0 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Glove Bag: Single use prefabricated, 0.25 mm (10 mil) minimum thickness polyvinylchloride bag with integral 0.25 mm (10 mil) thick polyvinylchloride gloves and elasticized ports. Bag must be equipped with reversible double-pull double throw zipper to facilitate progressive movement along pipe and also be equipped with interior zip and straps for sealing ends of bag around pipe. Acceptable product: Safe-T-Strip manufactured by Asbesguard Equipment Inc., in configurations suitable for Work.
- .2 Knife: Knife with fully retractable blade for use inside glove bag.
- .3 Securing Straps: For glove bag, reusable nylon straps at least 1" wide with metal tightening buckle for sealing ends of bags around pipe and insulation.
- .4 Sprayer: Garden reservoir type, low velocity, capable of producing mist or fine spray.

3.0 EXECUTION

3.1 Preparation

- .1 Moving of equipment, tools, supplies, and stored materials which can be performed without disturbing asbestos will be performed by others.
- .2 Segregate Asbestos Work Area use by closing doors, placing of barricades or tape barriers, etc. at the perimeter of each phase or Work Area.

- .3 At locations where the Asbestos Work Area will remain visible to other trades or building occupants, provide a second line of barricades, tape barriers, etc., a minimum of 20 feet (6 m) apart to form a buffer zone adjacent to each Asbestos Work Area.
- .4 Provide required tools, equipment, vacuum, materials and waste receptors within the established Asbestos Work Area.
- .5 Post required signs in all areas where access to the Asbestos Work Area is possible.
- .6 Do not commence contaminated Work until authorized by the Contract Administrator or his representative.

3.2 Maintenance of Contaminated Work Area

- .1 Maintain Work Area in a clean and tidy state.
- .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

3.3 Pipe Insulation Removal

- .1 Prior to start of Work, ensure Work Area has been isolated with tape barriers, saw-horses, or other barriers, posted with notices marking the area as asbestos removal area site and that authorization to proceed has been received from the Contract Administrator or his representative.
- .2 Proceed with selective demolition of mechanical and electrical equipment, building components, materials and items scheduled for demolition at locations required to facilitate access to concealed asbestos-containing materials.
- .3 Ensure any non-asbestos debris or rubble generated during this selective demolition is removed from the immediate area prior to commencement of any asbestos removal.
- .4 This Section shall remain responsible for the clean-up and disposal of all debris or rubble not able to be successfully segregated from asbestos-containing or contaminated materials during the selective demolition as completed by this Section.
- .5 Provide polyethylene drop sheet under piping where damaged or unjacketed insulation is present.
- .6 Spray surface of damaged jacketing with mist of amended water then tape over area of damage to provide temporary repair.
- .7 Mist areas of insulation with no jacketing and wrap with polyethylene.
- .8 Clean surface of pipe or minor amounts of fallen or damaged insulation by HEPA vacuuming or by damp wiping.
- .9 Place tools necessary to remove insulation in tool pouch then zip bag onto pipe and seal ends of bag with cloth securing straps. For valve glove bags, seal valve cover with wire tie or equivalent.

- .10 Place hands into gloves and use necessary tools to remove insulation from pipe.
- .11 Arrange insulation in bag to obtain full capacity of bag.
- .12 Roll jacketing carefully to minimize the possibility of ripping or puncturing bags.
- .13 Insert nozzle of spray pump into bag through valve and wash down pipe and interior of bag thoroughly. Alternate use of each hand to aid washing process.
- .14 Wet surface of insulation in lower section of bag and any exposed end of asbestos insulation remaining on pipe.
- .15 If bag is to be removed from pipe for use at a new location, seal closure strip from inside of bag then insert nozzle of HEPA vacuum into valve opening and evacuate air from balance of bag. Re-install and seal in new location before re-opening closure strip. Repeat insulation removal operation.
- .16 If bag is to be moved along the same pipe, insert nozzle of HEPA vacuum into valve opening and evacuate air from bag prior to loosen holding straps then carefully move bag along length of pipe and re-seal to pipe using double-pull zipper to pass hangers. Repeat insulation removal operation.
- .17 Should the glove bag become ripped, cut or opened in any way, cease Work and repair opening before continuing Work. If the rip, cut or opening cannot be easily repaired, dispose of as contaminated waste and replace with new.
- .18 Spilled material must be cleaned up using a HEPA vacuum immediately upon discovery.
- .19 To remove bag after completion of insulation removal or as each bag is filled:
 - .1 Wash top section of glove bag and tools thoroughly.
 - .2 Place tools in one hand (glove), then pull out inverted, twist to create a separate pouch, tape inverted hand at two (2) separate locations 1" apart to seal pouch.
 - .3 Remove inverted glove and tools by cutting between the two (2) tape seals.
 - .4 Place inverted glove and tools into the next clean glove bag to be used or into a water bucket, open pouch underwater and clean tools and then allow to dry.
 - .5 Insert nozzle of HEPA vacuum into valve opening and evacuate air from bag. Remove nozzle from valve opening and seal over end of valve with tape.
 - .6 Pull a 6 mil polyethylene bag over glove bag before removing from pipe.
 - .7 Remove securing straps, unfasten zipper and place sealed glove bag into a sealed 6 mil polyethylene bag so as to create an asbestos waste container.
- .20 Ensure newly exposed section of pipe is free of residue before resuming removal Work or leaving the area. If necessary, after removal of each section of asbestos, vacuum all surfaces of pipe, using HEPA filtered vacuum equipment or wet wipe with damp cloth.

- .21 Before completion of shift, seal surfaces of exposed pipe with lock-down agent to seal any residual fibres.
- .22 Cover exposed ends of remaining asbestos insulation with heavy coat of bridging encapsulant.
- .23 Remove drop sheet and dispose of as contaminated waste.

3.4 Site Dismantlement and Clean-up

- .1 Following completion of Work within each separate Asbestos Work Area, and again at the completion of each work shift, inspect the Work Area to ensure required removal and clean-up have been completed and the area is free of any visible signs of asbestos or other debris. Inspection must be completed by Shift Superintendent.
- .2 Schedule and obtain written approval of Milestone Inspection A (Site Dismantlement) before proceeding with the removal of all barricades, etc.

End of Section

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 Supplemental and General Conditions of the Contract.
- .2 Related work specified elsewhere:

Division 13,	Section 13080	Asbestos Abatement – General Provisions
Division 13,	Section 13086	Guano Cleanup
Division 13,	Section 13087	Chemical and Miscellaneous Waste Handling
- .3 The intent of this section is to provide safe work practices and procedures to govern the handling, packaging and transfer of Polychlorinated Biphenyls (PCBs) containing ballasts from fluorescent fixtures.

1.2 Outline of Work

- .1 Remove ballasts from light fixtures.
- .2 All ballasts are to be handled, transported and stored as PCB ballasts unless on-Site identification confirms the ballast to be non-PCB.
- .3 Separate PCB light ballasts from non-PCB light ballasts. Non-PCB light ballasts are to be disposed of as regular waste.
- .4 Transport and dispose of all PCB light ballasts at an authorized PCB waste disposal or destruction facility. Documentation verifying destruction is to be submitted.

1.3 Regulatory Agencies

- .1 Perform all Work in accordance with current Federal, Provincial, and local regulations and codes 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.

2.0 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

- .1 Containment Drums: New, not used double bung No.18 gauge cold rolled steel drum suitably sized to contain number of ballasts with removable steel lid, a PCB resistant gasket, and a 12 gauge compression type ring closure with a 5/8" bolt and forged lug. Drums shall be newly painted inside and out with bright white rust resistant enamel.
- .2 Drum Liner: Polyethylene bag, 36" x 60", 6 mil thick.
- .3 Vermiculite: Pre-packed, industrial grade 3, containing no asbestos.

.4 Label: Number 4 Severely Hazard Label, completed as Health 3, Fire 1, Environment 4, and Reactivity 1. Available from Environment Canada, Environmental Protection Service, (7th Floor, 25 St. Clair East, Toronto, 1-416-966-5840).

.5 Cleaning Solvent: Varsol or Trichloroethane.

2.2 Protective Equipment

.1 Gloves: Elbow length, PCB resistant material (neoprene or nitrile latex) in good condition.

.2 Apron: Full body neoprene apron.

3.0 EXECUTION

3.1 Packaging

.1 Before beginning Work, submit written procedures to the Contract Administrator for review. Do not begin Work on PCB ballasts until procedures have been approved in writing.

.2 Provide a minimum 8" layer of vermiculite at bottom of lined drum. Place ballasts on end in drum. Provide a minimum of 8" vermiculite layer between layers of ballasts. When full, seal liner bag with duct tape. Do not leave liner bags open overnight.

.3 Avoid rough handling of any ballasts, especially if already leaking. Do not throw into drum. Any leakage must be wiped up using vermiculite or wipers and cleaning solvent (Varsol or Trichloroethane).

.4 If oil gets onto hands wash with soap and water immediately for at least 15 minutes and seek medical attention.

.5 All contaminated materials, including gloves, clothing, wipers, etc., must be placed inside sealed bags in drums for disposal.

.6 Seal drums airtight with compression ring closure. Affix specified and completed label.

.7 As drums accumulate, transfer to storage area in building (co-ordinate through Contract Administrator).

3.2 Reporting

.1 Provide typed and signed transfer document for each transfer of PCB ballasts to the Contract Administrator giving the following:

.1 Number and size of drums.

.2 Ballast type, approximate number of ballasts.

.3 Approximate net weight of contents.

.4 Dates ballast removal begun and completed for each lot.

.5 Date drums transferred.

3.3 Worker Protection

- .1 At all times when handling ballasts, wear specified gloves and apron. Inspect protective apparel before each use for cracks, holes, or other penetrations. All contaminated clothing must be disposed of in specified drums. Note that the Tyvek material normally worn in asbestos removal sites DOES NOT provide protection against PCB liquids.
- .2 Wash hands thoroughly before taking breaks.
- .3 PCB liquids do not constitute an inhalation hazard when handling at room temperature. In the event of a fire hazard or other heating of the ballasts, immediately vacate the area and notify security and the Contract Administrator. Note that air purifying filter respirators used in asbestos abatement DO NOT provide protection against PCB vapours.
- .4 In the event of PCB ingestion, obtain medical assistance immediately.
- .5 Follow specified asbestos precautions for Work completed within Asbestos Work Areas.

3.4 Fire and Explosion Control

- .1 PCB liquids are relatively non-flammable. However, if exposed to flame or hot surfaces, a higher vapour concentration will result. Also, PCBs may decompose and chemically rearrange to produce highly toxic gases, vapours, and soot.
- .2 In the event of a fire involving PCBs, immediately stop Work and report to main security. The necessity to rapidly report the fire overrides normal asbestos decontamination procedures.
- .3 Cause all workers to evacuate the Site. When leaving, shutdown all water in use. Only personnel trained in use of, and wearing SCBA apparatus, will be allowed to re-enter the area.
- .4 Do not return to Work Site until the Contract Administrator or his representative and Environmental Protection officials have cleared the area for re-entry.

END OF SECTION

1.0 GENERAL

1.1 General And Related Work

- .1 Read this section in conjunction with all other sections so as to comply with the requirements of the Supplemental and General Conditions of the Contract.
- .2 Related Work Specified Elsewhere:
 - Division 13, Section 13080 Asbestos Abatement – General Provisions
 - Division 13, Section 13085 Packaging of PCB Ballasts
 - Division 13, Section 13087 Chemical and Miscellaneous Waste Handling
- .3 Unless otherwise shown or specified it is the intent that work performed as per this section will result in the removal and disposal or decontamination of all guano.

1.2 Site Conditions

- .1 Bird excrement is present in the following locations throughout the building:
 - .1 Inside the stack of the Boiler House.
 - .2 On floor and building surfaces throughout the Boiler House and the Main and 2nd Floor of the Elevator Building.
- .2 Workers removing accumulations of bird excrement are at risk of exposure to airborne fungal spores likely to be released when this material is disturbed. Bird and bat droppings are often contaminated with the fungi *Histoplasma capsulatum*, *Cryptococcus neoformans*, and other infectious hazards. The spores of some of these organisms can remain infectious for many years after their growth in the guano has ceased. Many of these microorganisms are known to cause respiratory infections in workers exposed during construction or maintenance disturbance.

NOTE: Although a disinfectant will be applied during this work, the treated excrement may still contain viable organisms and personal protective equipment must continue to be used until the site is well cleaned.

1.3 Outline of Work

- .1 Supply all labour, material, plant and equipment necessary to safely execute and complete all Work of this Section.
- .2 Isolate the Work Area from adjoining spaces through the placement of specified barriers and partitions at the perimeter of each phase or Work Area.
- .3 Remove and dispose of bird excrement at locations specified in Section 1.2 above.
- .4 Protect surfaces throughout the Work Area and prevent the spread of dust, by use of polyethylene drop sheets or other suitable materials.

1.4 Schedule

.1 Work Hours:

Normal Work Hours: 08:00 through 17:00 (Mon. - Fri.).

Quiet Hours: As directed by the Contract Administrator.

- .2 Provide necessary manpower, supervision, equipment and materials to maintain and complete the project on schedule.
- .3 Provide 48 hours written notice to the Contract Administrator of any request to work outside normal working hours. Obtain written approval before proceeding.

1.5 Supervision

In addition to any requirements for Contractor's Supervisor identified in Section D4 – Contractor's Supervisor, the Contractor's Supervisor will require the following:

- .1 Provide on-site a Shift Superintendent, who has authority regarding all aspects related to manpower, equipment and production.
- .2 The Shift Superintendent must be on site at all times during Work at risk of disturbing contaminated materials. Failure to comply with this requirement will result in a stoppage of all Work, at no cost to the City.
- .3 Replace supervisory personnel, with approved replacements, within 1 working day of a written request from the Contract Administrator. Contract Administrator reserves the right to request replacement of supervisory personnel without explanation.
- .4 Contractor cannot replace supervisory personnel without written approval of the Contract Administrator.

1.6 Quality Assurance

- .1 Project staff and supervisors shall be trained on the potential hazards of guano exposure, safe use of the disinfectant, use and care of personal protective equipment, work practices for decontamination of surfaces, and packaging and disposal of waste.
- .2 Ensure Work proceeds to schedule, meeting all requirements of this specification.
- .3 All Work of this section involving electrical, mechanical, carpentry, glazing etc. shall be performed by licensed persons experienced and qualified for the Work required.
- .4 The Contract Administrator will not be responsible for, and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs required for the Work in accordance with the applicable construction safety legislation, other regulations or general construction practice. The Contract Administrator will not be responsible for, or have control or charge over the acts or omissions of the Contractor, his Subcontractors or their agents, employees or other persons performing any of the Work.

1.7 Submittals

- .1 Submit prior to starting work:
 - .1 Names and credentials of the Shift Superintendents.
 - .2 Proof with references that supervisory personnel have performed supervisory functions on at least five other similar cleanup projects.
 - .3 Provide names of trades-people on site. The Contract Administrator reserves the right to request detailed personal information if required for security checks.
 - .4 Proof that workers have received WHMIS training.
 - .5 WSIB status and transcription of insurances.
 - .6 Proposed schedule providing the following for each separate Work Area:
 - .1 Duration of set-up, removal and refit work in each Work Area.
 - .2 Proposed average daily work force.
 - .7 Any proposed deviation from specifications, procedures, or drawings.
 - .8 Material Safety Data Sheets for chemicals or material used in the course of the project.
 - .9 Performance data on negative air units and results of leak tests.
 - .10 Certificate proving that each worker on site has been fit tested for the respirators to be used on the project.
 - .11 Pre-removal survey of damage in all areas where abatement will take place or waste will be transported.
 - .12 Submit on a biweekly basis, time and material sheets for investigation work and additional remediation work, where so directed.

1.8 Regulations

- .1 Comply with provincial and local requirements and these specifications, provided that in any case of conflict, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time Work is performed. Regulations include, but are not limited to:
 - .1 Department of Labour Occupational Health and Safety Act and regulations, including Regulations for Construction Projects, as amended.

1.9 Acceptable Equipment and Materials

- .1 Air Purifying Respirator: Minimum of a full facepiece respirator fitted with appropriate cartridge filters. As a minimum, P100 filters are required for protection against airborne particles. Depending on the disinfectant used, the cartridge may have to include protection against vapours or gases. A Powered Air Purifying Respirator (PAPR) fitted with an appropriate cartridge filter is preferred.
- .2 Disposable Coveralls: Full body disposable coveralls with attached hood.

- .3 Acceptable disinfectants:
 - .1 Concrete and Wood Scrub/Disinfectant, Dupont Canada Inc., 1-800-387-2122 or equivalent.
- .4 Flexible Ducting: Tubing with metal reinforcement or approved equal. Diameter to equal negative air discharge.
- .5 Gloves: Either disposable gloves taped to coveralls and worn under work gloves, or heavy rubber or nitrile work gloves, taped to coveralls.
- .6 HEPA Vacuum Cleaner: Vacuum cleaner, with appropriate tools and hose, fitted with High Efficiency Particulate Air filter.
- .7 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints. New Materials Only.
- .8 Rip-Proof Polyethylene Sheeting: Minimum requirements: 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New Materials Only.

1.10 Worker and Visitor Medical Prescreening

- .1 Workers performing contaminated Work must be free from asthma, mould allergies, any immunocompromised condition, present or recent (three days) infection with a virus or bacteria, bronchitis, pneumonia, etc., and shall not be pregnant. A medical consultation, to confirm suitability for working under conditions of guano disturbance, is recommended.
- .2 Each worker and supervisor shall sign an Acknowledgment Letter stating that they have received and understood the medical warning and requirements for personal protection and decontamination. Copies of the signed forms shall be provided to the Consultant.
- .3 Maintain a posted list of workers on the abatement project.

1.11 Worker Personal Protective Equipment

- .1 During contaminated Work workers shall wear personal protective equipment as follows:
 - .1 Full facepiece air purifying respirator.
 - .2 Disposable coveralls with hood up.
 - .3 Rubber work boots taped to coveralls.
 - .4 Gloves taped to coveralls.
- .2 Persons required to enter contaminated areas shall be clean-shaven, daily, along the sealing line of the respirator.
- .3 Dispose of respirator filters daily.

1.12 Visitor Protection

- .1 Provide appropriate coveralls and gloves to visitors to the site, including the Consultant. Visitors and the Consultant shall be responsible for their own respiratory protection.

1.13 Inspection

- .1 From commencement of Work until completion of clean-up operations, the Consultant will be present periodically on site both inside and outside the Work Area.
- .2 The Contract Administrator or his representative is empowered to inspect adherence to specified procedures and materials, and to inspect for final cleanliness and completion. Additional labour or materials expended by the Contractor to provide satisfactory performance to the level specified would be at no additional cost to the City.
- .3 The Contract Administrator or his representative is empowered to order a shutdown of Work when a leakage of contaminant from the controlled Work Area has occurred or is likely to occur. These conditions include, but are not limited to, failure of negative pressure systems, failure of the perimeter enclosure, water leaks, etc. Additional labour or materials to rectify these or other unsatisfactory conditions shall be at no cost to the City.
- .4 Inspection performed as a result of Abatement Contractor's failure to perform satisfactorily regarding quality, safety, schedule, shall be back-charged to the Contractor.

2.0 EXECUTION

2.1 Site Preparation

- .1 Full personal protective equipment must be worn during site setup where guano or carcasses may be disturbed by setup work.
- .2 Post hazard signs at access points to the Work Area.
- .3 Provide negative pressure during guano cleanup within the Boiler House and Boiler House stack.
- .4 Guano clean-up may be performed within an established Type 3 enclosure while adhering to the following procedures.

2.2 Guano Clean-up

- .1 Perform an initial dry HEPA vacuum removal of as much loose residue as possible.

- .2 Following a HEPA vacuuming, apply a disinfectant solution to all areas with visible residue. Apply with a garden sprayer set for droplet as opposed to mist spraying. Apply additional disinfectant as necessary to maintain the area wet for the contact time specified by the disinfectant manufacturer. Leave the material wet overnight where practical to do so.
- .3 After the treated residue has dried, clean the area of residue with suitable tools and HEPA vacuuming. Lightly mist with water to reduce aerosol formation.
- .4 After surfaces have been cleaned of residue to the extent possible, apply a second application of the disinfectant, maintaining wet for the period recommended by the manufacturer.

2.3 Work Area Teardown And Dismantling

- .1 Remove all site isolation.
- .2 HEPA Vacuum and damp mop all surfaces within and immediately adjacent to Work Area.

2.4 Waste Handling and Disposal

- .1 Collect all waste into 6 mil disposal bags, and immediately seal. Wipe the bag with the disinfectant solution and place into a second bag. Waste can be disposed of to municipal sanitary landfills.
- .2 All waste is to be placed into a lockable closed-top bin. Clean the Work Areas, transferring the waste to the bin frequently, and prior to completion of Work on each workday. Lock bin when not in use.

End of Section

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 Supplemental and General Conditions of the Contract.
- .2 Related work specified elsewhere:

Division 13,	Section 13080	Asbestos Abatement – General Provisions
Division 13,	Section 13085	Packaging of PCB Ballasts
Division 13,	Section 13086	Guano Clean-up
- .3 The intent of this section is to provide safe work practices and procedures to govern the proper handling and removal of chemical and miscellaneous waste products from the Work Area.

1.2 Outline of Work

- .1 Supply all labour, material, plant, and equipment to safely execute and complete the Work of this section.
- .2 Separate, store, and handle materials on Site in order to maximize recyclability and salvageability of identified materials.
- .3 Recycle all materials where possible and feasible.
- .4 Dispose of all materials at a licensed hazardous waste handling/disposal facility.
- .5 Pump water from Elevator Building Basement into a licensed hauler and transport it to a Water Treatment Plant.

1.3 Site Conditions

- .1 The following hazardous or potentially hazardous chemical and miscellaneous waste products are present throughout the Boiler House and Elevator Building:
 - .1 Approximately eleven (11) spray paint cans on the 2nd Floor of the Elevator Building and five (5) to ten (10) spray paint cans scattered throughout the Main floors of the Elevator Building and Boiler House.
 - .2 Miscellaneous bottle of boiler treatment liquid south of boilers in Bboiler House.
 - .3 Two bags of silica cement parging on the east side of the north Boiler.
 - .4 Approximately ten (10) mercury containing boiler control switches along west side of boilers.
 - .5 Three (3) industrial batteries in the northwest Basement of the Boiler House.
 - .6 Flood water in Basement of Elevator Building.

1.4 Regulatory Agencies

- .1 Perform all Work in accordance with current Federal, Provincial, and local regulations and codes 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.

2.0 WORKER PROTECTION

2.1 Protective Equipment

- .1 Gloves: Elbow length, natural rubber, nitrile latex, or polyvinyl chloride) in good condition.
- .2 Respiratory Protection: Negative pressure non-powered half-face respirators with HEPA filters.
- .3 Protective Clothing: Full body disposable coveralls with attached head covering.
- .4 Eye Protection: Dust proof goggles.

2.2 Work Area Procedures

- .1 During handling of chemical waste materials, supply and use negative pressure non-powered half-face respirators with HEPA filters.
- .2 During handling of chemical waste materials, don coveralls, head covers, safety goggles, and protective gloves. Protective clothing shall cover hair, exposed skin, and any reusable clothing.

END OF SECTION

1.0 GENERAL

1.1 Scope of Work

- .1 This specification covers the decommissioning of an 8,000 gallon fuel oil aboveground storage tank (AST) and associated systems located near the southwest corner of the Boiler House Basement at the former Ogilvie Flour Mill Site.
- .2 Work required includes provision of all approvals, permits, labour and equipment necessary for Site preparation, decommissioning of the AST and Site restoration. Work will proceed in coordination with and will be subject to inspection by the Contract Administrator or his representative.
- .3 Work shall be executed in accordance with all regulations and guidelines specified by Federal and/or Provincial and/or local governing agencies.
- .4 Documentation of all disposals must be provided to the Contract Administrator.

1.2 Description of Work

- .1 Arrange for or pump out and disposal of, or arrange for disposal of, remaining liquids and/or residual sludge from the AST and associated systems prior to decommissioning (assume 100 gallons).
- .2 Lower the concentration of explosive gases in the AST to an acceptable level; this can be done by adding dry ice, purging the tank with an inert gas or applying some other acceptable method.
- .3 Remove any obstructions to gain access to the AST; this may involve removing a steel, concrete or asphalt cover or other structure material. Do not damage the AST or associated piping.
- .4 Disconnect and remove lines to and from the AST other than the vent line. Alternatively, all lines and any openings at the AST can be sealed, excluding the vent line.
- .5 Arrange for and schedule with the Contract Administrator and/or his representative all necessary tests to measure the tank and area for explosive gases and organic vapours and any other confined space testing required by regulations and safe work practices.

1.3 Documents

- .1 Examine all reports, drawings, and specifications, available for the Site.

1.4 Examination

- .1 The Contractor shall visit and inspect the Site and ensure complete familiarity with Site conditions related to execution of the Work under this section.
- .2 Arrange for and schedule all required Site inspections as required by the Contract Administrator or his representative and any regulatory agency having jurisdiction.

1.5 Quality Assurance

- .1 Provide to the Contract Administrator evidence of general commercial insurance and letter of good standing from the Workers Compensation Board.
- .2 Acquire all necessary permits for the decommissioning of AST, transportation of hazardous substances and waste dangerous goods, and disposal of hazardous substances and waste dangerous goods.
- .3 Provide to the Contract Administrator the name and credentials of on-site supervisor. Do not change Contractor's Supervisor without written notification to the Contract Administrator.
- .4 The current issue of the following documents shall govern the Work conducted under the terms of this contract (where conflict between regulatory requirements and these specifications exists, the more stringent requirements shall apply):
 - .1 Regulations:
 - .1 Comply with applicable Federal, Provincial, Municipal and local regulations.
 - .2 Manitoba Conservation, The Dangerous Goods Handling and Transportation Act, Storage and Handling of Petroleum Products and Allied Products Regulation (188/2001).
 - .3 CCME, Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products, PN 1326, October 2003.
- .5 No cutting torch, open flame, electric or spark producing equipment shall be used on the AST or associated pipework, unless the equipment has been properly purged of hydrocarbon liquid and vapours.
- .6 All spillage surrounding this project from the AST and associated piping systems must be avoided and any spills must be cleaned immediately.

1.6 Personnel Protection

- .1 Personnel entering the area shall be equipped with steel-toed work boots, hard hats, gloves, hearing protection and safety glasses as required by Manitoba Labour.
- .2 Workers shall be equipped with appropriate personal protective gear. Should contamination be encountered and exposure to hazardous materials be encountered, the worker must use or wear such equipment as appropriate and necessary.
- .3 Use electrical generators and temporary lightning to provide workers with adequate lightning.
- .4 If in a high traffic area, high visibility vests shall be worn.
- .5 Use barricades and warning signs where necessary.

- .6 Avoid skin contact and inhalation of hydrocarbon products.
- .7 Promptly wash hydrocarbon contaminated soaked clothes and avoid using soaked leather goods. Properly dispose of any soaked rags.
- .8 Keep Work Area clean and well ventilated.
- .9 Clean up spills promptly.
- .10 Precautions must be taken to eliminate all potential sources of ignition from the area (ie. smoking materials, non explosion-proof electrical and internal combustion equipment).
- .11 Prevent debris from blocking surface drainage system, mechanical and electrical systems which must remain in operation.
- .12 Do not dispose of waste or volatile materials such as mineral spirits, oil, petroleum based lubricants or toxic cleaning solutions into watercourses, septic tanks or fields, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout the project.
- .13 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- .14 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.
- .15 Fires and burning of waste or materials is not permitted on Site.
- .16 Do not bury waste or materials on Site.
- .17 Prevent accumulation of vapours at ground level. Prevent the discharge of static electricity during venting of flammable vapours.

1.7 Special Procedures

- .1 Provide and instruct authorized visitors in proper procedures/personal equipment to be adhered to before entering and exiting from Work Areas.
- .2 Do not encumber Site with materials and equipment. Obtain and pay for use of additional storage or Work Areas if required.
- .3 Every effort shall be made to protect the surrounding environment, landscape and property from contamination.

2.0 PRODUCTS AND FACILITIES

2.1 Materials

- .1 Hazardous substances and waste dangerous goods include remaining liquids and/or residual sludge from the AST and associated systems, as well as any other contaminated materials that may be encountered during the tank decommissioning process.

3.0 EXECUTION

3.1 Site Preparation

- .1 Examine AST location and associated pipe work with the Contract Administrator or his representative to determine extent of Work at the Site. Develop specific work procedures for decommissioning of the AST.
- .2 Ensure all necessary permits, services and documents are available on Site before Work procedures begin. Arrange for any required inspections by regulatory agencies.
- .3 Decommissioning procedures shall include, but not be limited to, the following:
 - .1 Identify exact location, size, orientation and condition of the AST to ensure a good Work area.
 - .2 Drain product piping into the AST. Disconnect and remove all associated piping, or seal ends of piping and leave in place.
 - .3 Drain excess liquid and removal sludge from the AST and remove off Site by an approved hauler. Ensure explosion proof or air-driven pumps are used.
 - .4 Remove all AST fixtures and non-product lines except for the vent line. Alternatively, all lines and tank openings can be sealed, excluding the vent line.
 - .5 If required, purge tank of vapours to a level of less than 10% of the LEL by an approved method (ie. inert gas such as carbon dioxide or nitrogen or dry ice). Pressure in the AST shall not exceed 5 pounds per square inch gauge when using these methods.
 - .6 Have AST inspected by the Contract Administrator and/or his representative.
- .4 At the completion of all Work, the Contract Administrator and/or his representative will conduct a final contractual acceptance. Work not done to the satisfaction of the Contract Administrator or his representative must be redone to the same and costs incurred by the Contractor. Failure to carry Work out to the satisfaction of the Contract Administrator may result in the termination of the contract.

4.0 PAYMENT

Payment for Work under this section will be at a lump sum price.

5.0 SUBMITTALS

The Contractor, upon completion of the Site Work shall provide copies of all permits, waste manifests etc. to the Contract Administrator and/or his representative.

END OF SECTION