PART 1 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 Division 1 and the General Conditions of the Contract.

.2 Related Work Specified Elsewhere

Division 13,	Section 02 82 11	Asbestos Abatement - Moderate Risk/Type 2
Division 13,	Section 02 82 12	Asbestos Abatement - High Risk/Type 3
Division 13,	Section 02 82 13	Asbestos Abatement - Glove Bag
Division 13,	Section 02 84 10	Mercury Lamps and PCB Ballasts

.3 The site conditions identify the location and condition of all known asbestos-containing materials (ACM) to be disturbed by the work of this section.

.4 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 ACM and all materials which have been contaminated by ACM either during or prior to work of this section.

1.2 Site Conditions

.1 Refer to the Hazardous Building Materials Assessment Report, prepared by Pinchin Ltd., dated January 31, 2019 for details on hazardous building materials present in the Work Area.

1.3 Outline of Work

.1 Coordinate the following items with the Construction Manager and Environment and Climate Change Canada (ECCC), which are to be included in the lump sum bid of the Abatement Contractor, including but not limited to: electrical isolations, GFI connection, water connections, hoarding walls, bin placement, hours of work, schedule, etc.

.2 Contractor to verify actual site conditions during the site visit walkthrough, prior to tender, and base tender price on conditions and quantities found. Coordinate all phasing of work with ECCC or the Construction Manager. No extras for variations in quantities or phasing of work/work areas will be accepted.

.3 Use Type 1 procedures to remove and dispose of the following:

.1 Vinyl floor tiles (12” x 12” cream and brown streaks) in the Ground Floor Vestibule (Location 14).

.1 Associated mastic is non-asbestos.

.2 Cork duct insulation and black mastic present in the duct chase within the Basement Work Area (Location 8) and on the Ground Floor adjacent to the Corridor/Janitor Closet (Location 3).

.1 Include to remove all residual black mastic from duct surfaces.

.2 Demolish the duct chase on the Ground Floor to access the insulation for removal, if required.

.3 Roof flashing with asbestos-containing brown caulking around the flashing and on screws, on the Roof and Exterior (Location 15).

.4 Hard grey caulking at the perimeter of glass block windows throughout the Exterior (Location 15).

.5 Roof flashing with asbestos-containing tar present over the Exterior Ramp Shed (Location 15).

.6 Presumed asbestos-containing residual tar, presumed to be present on concrete deck below newer non-asbestos roofing, Roof (Location 15).

.7 Presumed asbestos-containing electrical components (i.e. transite inside electrical disconnects) and wiring throughout the Building.

.4 Follow the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014) during disturbance of all paint. Special precautions are not required unless aggressive disturbance (grinding, blasting, torching, and welding) is planned of paints in the renovation areas that contain low levels of lead (i.e., less than the Surface Coating Materials Regulatory cut-off of 0.009% for lead-containing paints). Complete the following:

.1 Remove paint where cutting of steel will occur.

.2 Remove paint where it may be disturbed by the work or follow lead procedures as outlined in the EACO guideline.

.5 Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with provincial standards or guidelines.

.1 Silica work is to be completed in accordance with the Ontario Ministry of Labour Guideline: Silica on Construction Projects, September 2004 (revised 2011).

1.4 Schedule

.1 Coordinate all work, scheduling and phasing with the Construction Manager and ECCC.

1.5 Definitions

.1 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including: actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.

.2 Asbestos Abatement Consultant: Owner's Representative providing inspection and air monitoring.

.3 Asbestos Abatement Contractor: Contractor or sub-contractor performing work of this section.

.4 Asbestos-Containing Material(s) (ACM): Material(s) identified under Site Conditions including debris, fallen material and settled dust.

.5 Asbestos Work Area: Area where work takes place which will, or may, disturb ACM.

.6 Authorized Visitors: Prime Contractor, Building Owner or Representatives, Asbestos Abatement Consultant, and persons representing regulatory agencies.

.7 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with Regulation 278/05 and the Occupational

Health and Safety Act, and has knowledge of the potential or actual danger to health and safety in the work.

.8 Friable Material: means a material when dry can be crumbled, pulverized or powdered by hand pressure or is crumbled, pulverized or powdered.

.9 HEPA Filter: High Efficiency Particulate Arresting filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.

.10 PCM: Phase Contrast Microscopy.

.11 Polyethylene: Either polyethylene sheeting or rip-proof polyethylene sheeting (as specified) with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect underlying surfaces from damage, and to prevent escape of asbestos fibres through sheeting into Occupied Areas.

.12 Occupied Area: Any area of the building outside the Asbestos Work Area.

.13 Personnel: All contractor's employees, sub-contractor's employees, supervisors.

.14 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g. remove and turn over to Owner).

.15 TEM: Transmission Electron Microscopy.

1.6 Submittals

.1 Submit prior to starting work:

.1 Workplace Safety and Insurance Board Clearance Certificate.

.2 Insurance certificates.

.3 Copy of Company Health and Safety Policy and applicable Programs.

.4 Copy of Certificate of Approval for transportation of asbestos waste and location of landfill.

.2 Submit the following information regarding personnel prior to starting work:

.1 Resumes of the supervisory personnel.

.2 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal (2 day minimum duration) or are certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.

.3 WHMIS training certificates for all personnel.

.4 Written statement that personnel have had instruction on hazards of asbestos exposure, the use of respirator, protective clothing, worker and waste decontamination procedures, and all aspects of work procedures and protective measures.

.5 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.

.3 Submit performance data on HEPA filtered vacuums including HEPA challenge integrity leak tests no more than 3 months old prior to isolating the work area or commencing asbestos abatement.

.4 Submit the following prior to isolating the work area:

.1 Written statement that the Ground Fault Interrupter Panels use CSA approved parts and have been inspected by the Electrical Safety Authority.

.2 Material Safety Data Sheets for chemicals or material used in the course of the Asbestos Abatement Project.

.5 Submit the following upon completion of the work.

.1 Manifests, waybills, bills of ladings etc. as applicable for each type of waste.

1.7 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. Regulations include but are not limited to the following:

.2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.

.3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.

.4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

1.8 Supervision

.1 Provide onsite, a supervisor, with authority to oversee all aspects of the work, including but not limited to, health and safety, methods, scheduling, labour and equipment requirements.

.2 The supervisor must be on site at all times during work at risk of disturbing ACM. Failure to comply with this requirement may result in a stoppage of work, at no cost to the Owner.

.3 Provide a minimum of one supervisor for every 10 workers.

.4 Replace supervisory personnel, with approved replacements, within 3 working days of a written request from the Asbestos Abatement Consultant. Asbestos Abatement Consultant reserves the right to request replacement of supervisory personnel without explanation.

.5 Do not replace supervisory personnel without written approval from the Asbestos Abatement Consultant.

1.9 Quality Assurance

.1 Ensure the removal and handling of ACM or asbestos contaminated materials is performed by persons experienced in the methods, procedures and industry practices of asbestos abatement.

.2 Complete work so that at no time airborne asbestos, visible solid residue, or water runoff contaminates areas outside Asbestos Work Area. Asbestos Abatement Consultant is empowered to order a shutdown of work when a leak has occurred or is likely to occur. Cost of additional work by Asbestos Abatement Contractor and/or Asbestos Abatement Consultant to rectify unsatisfactory conditions shall be charged to the Asbestos Abatement Contractor.

.3 Perform all work involving other trades such as electrical, mechanical, carpentry, glazing etc. using licensed persons experienced and qualified for the work required.

.4 The Asbestos Abatement Consultant 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 Asbestos Abatement Consultant will not be responsible for or have control or charge over the acts or omissions of the Asbestos Abatement Contractor, his Subcontractors or their agents, employees or other persons performing any of the Work.

1.10 Notification

.1 Notify Sanitary Landfill site as per Ontario Regulation 347 as amended.

.2 Inform all sub trades of the presence of ACM identified in the contract documents.

.3 Notify the Owner or Owners Representative, the Joint Occupational Health and Safety Committee and the Ontario Ministry of Labour, as required by Regulation 278/05, if friable materials not identified in the contract documents are discovered during the course of the work. Stop work in these areas immediately.

1.11 Insurance

.1 Maintain a Commercial General Liability Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Commercial General Liability insurance shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period.

.2 Maintain an Automobile or Fleet Policy, and Non-owned Automobile Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of these policies is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract.

.3 Maintain a Pollution Liability Policy (or asbestos liability policy or specific coverage under the CGL for asbestos abatement) with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and THE OWNER harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Pollution Liability shall be provided on an "occurrence" basis to cover

injury or damage (whether detected or not during the policy period) which happens during the policy period. Without limiting the generality of the foregoing, the policy shall insure the operations of asbestos abatement and shall not contain any environmental and/or health hazard exclusions relating to remediation operations including asbestos abatement.

.4 Forward all certificates to Pinchin Ltd. and ECCC before work is commenced, showing Pinchin Ltd. and ECCC as additional insured as their interest may appear.

.5 ECCC may request a certified true copy of the policies.

.6 The limits will not be less than:

.1	Commercial General Liability	$5,000,000.00
.2	Automobile	$2,000,000.00
.3	Pollution Policy (Asbestos Liability)	$5,000,000.00

1.12 Instruction and Training

.1 Provide instruction and training to all workers including the following:

- .1 Hazards of asbestos.
- .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that would be used and worn during abatement work, including:
  - .1 Limitations of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Proper fitting of equipment.
  - .4 Disinfecting and cleaning of equipment.
- .3 Personal hygiene to be observed when performing the work.
- .4 The measures and procedures prescribed by this section.

.2 Instruction and training must be provided by a competent person.

1.13 Personal Protection

.1 Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters when requested by personnel. Respirators are required for Low Risk work under the federal regulations.

.2 Respirators shall be:

- .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
- .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
- .3 Assigned to a worker for their exclusive use.
- .4 Maintained in accordance with manufacturer's specifications.
- .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.

.6 Repaired or have damaged or deteriorated parts replaced.

.7 Stored in a clean and sanitary location.

.8 Provided with new filters as necessary, according to manufacturer's instructions.

.3 Personnel must have respirators fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.1 Personnel shall wear and use the respirator provided.

.4 As per the requirements of Regulation 278/05, when requested by personnel, and as required by the federal regulations, provide protective clothing which:

.1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.

.2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.

.3 Is replaced or repaired if torn or ripped.

.5 Decontaminate clothing or protective clothing by using a HEPA Vacuum, or by damp wiping prior to leaving the Asbestos Work Area:

.1 Dispose of as ACM.

.6 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Asbestos Work Area.

.7 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

.8 Use hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

1.14 Authorized Visitor Protection

.1 Provide clean protective clothing and equipment, and approved respirators to Authorized Visitors.

.2 Ensure Authorized Visitors have received required training prior to granting entry into Asbestos Work Area.

1.15 Inspection

.1 From commencement of work until completion of clean-up operations, the Asbestos Abatement Consultant may be present periodically on site both inside and outside the Asbestos Work Area.

.2 Inspection of the Asbestos Work Area will be performed to confirm the Asbestos Abatement Contractor's compliance with the requirements of the contract documents and governing authorities. Any deviations from these requirements that have not been approved in writing may result in a stoppage of work at no additional cost to the Owner.

.3 If the Asbestos Work Area is found unacceptable by the standards specified or required by governing authorities, the remedial work required to meet these standards and obtain consent to proceed from the Asbestos Abatement Consultant, shall be performed at no additional cost to the Owner.

.4 The following Milestone Inspections may take place, at the Owner's cost:

.1 Milestone Inspection A - Clean Site Preparation

.1 Inspection of preparations and set-up prior to contaminated work in the Asbestos Work Area.

.2 Milestone Inspection D - Visual Clearance

.1 Inspection of Asbestos Work Area after removal of all asbestos, but prior to application of lock-down agent.

.5 The Asbestos Abatement Consultant is empowered by the Owner to inspect for final cleanliness at completion. Additional labour or materials expended by the Asbestos Abatement Contractor to provide satisfactory performance to the level specified shall be at no additional cost.

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 All materials and equipment brought to work site must be in good condition and free of asbestos, asbestos debris, and fibrous materials.

.2 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.

.3 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.

.4 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:

.1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.

.2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.

.3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.

.5 Ground Fault Panel: Electrical panel as follows:

.1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical equipment and lights in Asbestos Work Area.

.2 Interrupters to have a 5 mA ground fault protection.

.3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.

.4 Openings sealed to prevent moisture or dust penetration.

.5 Inspected by the Electrical Safety Authority.

.6 Panel uses CSA approved parts and been constructed, inspected and installed by a licensed electrician.

.6 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.

.7 Hose: Leak-proof, minimum busting strength of 500 PSI or greater if required, abrasion resistant covering, reinforcing, and machined-brass couplings. Maintained and tested. Hose to be temperature resistant if it is to carry domestic hot water.

.8 OSB: Oriented Strand Board.

.9 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.

.10 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.

.11 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.

.12 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.

.13 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.

.14 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

.15 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

2.2 Signage

.1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area and on hoarding walls as follows:

.1 CAUTION.

.2 Asbestos Dust Hazard Area.

.3 Unauthorized Entry Prohibited.

.4 Wear Assigned Protective Equipment.

.5 Breathing Asbestos Dust May Cause Serious Bodily Harm.

.2 Vehicles, Bins and Asbestos Waste Containers: Post signs on both sides of every vehicle used for the transportation of asbestos waste and on every asbestos waste container. Signs must display thereon in large, easily legible letters that contrast in colour with the

background the word "CAUTION" in letters not less than ten centimetres in height and the words:

.1 CONTAINS ASBESTOS FIBRES

.2 Avoid Creating Dust and Spillage

.3 Asbestos May be Harmful to Your Health

.4 Wear Approved Protective Equipment.

.3 Place placards in accordance with Transportation of Dangerous Goods Act.

PART 3 EXECUTION

3.1 Site Preparation

.1 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.

.2 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.

.3 Install polyethylene drop sheets below areas of work.

.4 Install signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

.5 Isolate, at panel, and disconnect existing power supply to Asbestos Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.

.1 Lock-out/tag-out power at electrical panels.

.2 Mark/tag any items within or passing through the Asbestos Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.

.6 Shut down HVAC systems serving the Asbestos Work Area.

.1 Install polyethylene sheeting over openings in ducts and diffusers and seal.

.7 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc.).

.8 Provide power from ground fault interrupt circuits as follows:

.1 Use CSA approved ground fault interrupt outlets outside the Asbestos Work Area to provide power to equipment within the enclosure.

.2 All electrical equipment used during work shall be supplied power from a Ground Fault Panel.

3.2 Maintenance of Asbestos Work Area

.1 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.

.2 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Asbestos Work Area.

.3 Maintain Asbestos Work Area in tidy condition.

.4 Remove any standing water on polyethylene/floor at the end of every shift.

3.3 Asbestos Removal - General

.1 Do not use powered tools or non-hand held tools.

.2 Do not use compressed air to clean or remove dust or debris.

.3 Do not break, cut, drill, abrade, grind, sand or vibrate ACM if it cannot be wetted. Type 2 procedures would be required if the material cannot be wetted due to hazard or damage.

.4 Wet ACM prior to work and keep ACM wet throughout the removal process.

.5 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.

.6 Frequently and at regular intervals, place all waste in asbestos waste containers.

.7 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.4 Asbestos Removal - Vinyl Asbestos Tile

.1 Wedge a heavy duty scraper in seam of two adjoining tiles and gradually force edge of one tile up and away from floor. Do not break off pieces of tile, but continue to force balance of tile up.

.2 Place tile, without breaking into smaller pieces, into Asbestos Waste Container.

.3 Force scraper through tightly adhered areas by striking scraper handle with a hammer.

.4 Heat tile thoroughly with a hot air gun until heat penetrates through tile and softens adhesive in areas where scraper will not remove tile.

.5 HEPA vacuum floor on completion of work in area.

3.5 Asbestos Removal - Removal of Other Non-Friable Asbestos Materials

.1 Wet all material to be disturbed.

.2 Undo fasteners if necessary to remove material.

.3 Break material only if unavoidable, and wet material if broken during work.

.4 Use only non-powered hand-held tools to remove ACM.

.5 Scrape to remove material adhered to substrate.

.6 Place removed ACM directly into an asbestos waste container.

3.6 Waste and Material Handling

.1 Waste bins must be placed on grade or in receiving.

.2 All bins must be locked and covered when waste transfer is not being performed.

.3 Ensure redundant non-ACM, rubble, debris, etc. removed during contaminated work are treated, packaged, transported and disposed of as asbestos waste.

.4 Clean and wash equipment prior to removal from Asbestos Work Area if removed prior to completion.

.5 Place all equipment, tools and unused materials that cannot be cleaned in Asbestos Waste Containers.

.6 As work progresses, and at regular intervals, transport the sealed and labelled asbestos waste containers from the Asbestos Work Area to waste bin.

.7 Place items in bins according to waste classification. Place asbestos waste, metals, non-asbestos waste, etc. in separate bins.

.8 Removal of waste containers and decontaminated tools and materials from the Asbestos Work Area shall be performed as follows:

.1 Remove any visible contamination from the surface of the non-porous or sealable item being removed from the Asbestos Work Area. If the item can be cleaned, remove it from the site. If it cannot be cleaned thoroughly, place it in an Asbestos Waste Container.

.2 Place waste or item in Asbestos Waste Container and seal closed.

.3 Wet wipe outside of Asbestos Waste Container.

.4 At entrance to Asbestos Work Area, place in second Asbestos Waste Container. Seal closed.

.5 Remove the item from the Asbestos Work Area.

.9 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner.

.10 Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled ACM in the case of a rupture of an Asbestos Waste Container.

.11 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owners operations.

.12 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

.13 Co-operate with Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

3.7 Application of Post Removal Sealant

.1 Obtain Asbestos Abatement Consultant's written permission to proceed.

.2 Apply one coat of Post Removal Sealant with an airless sprayer, in accordance with Manufacturer’s Instructions, to cover all surfaces on all items in the Asbestos Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition.

3.8 Asbestos Work Area Dismantling

.1 Wash or HEPA vacuum equipment used in Asbestos Work Area, seal vacuum hoses and fittings.

.2 Place tools and equipment used in contaminated work site but not cleaned in 6 mil polyethylene bags prior to removal from Asbestos Work Area.

.3 Clean polyethylene sheeting and drop sheets with HEPA vacuum or wet cleaning methods at completion of work.

.4 Wet drop sheets and polyethylene sheeting.

.5 Remove seals, tape, signage etc.

.6 Seal openings in HEPA vacuums.

.7 Place polyethylene sheeting, drop sheets, seals, tape, clothing and other contaminated waste in asbestos waste containers, wet wipe and place in second asbestos waste container.

.8 Rigid portable enclosures and rigid barriers that are to be reused shall be cleaned thoroughly.

END OF SECTION

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PART 1 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 Division 1 and the General Conditions of the Contract.

.2 Related Work Specified Elsewhere

Division 13,	Section 02 82 10	Asbestos Abatement - Low Risk/Type 1
Division 13,	Section 02 82 12	Asbestos Abatement - High Risk/Type 3
Division 13,	Section 02 82 13	Asbestos Abatement - Glove Bag
Division 13,	Section 02 84 10	Mercury Lamps and PCB Ballasts

.3 The site conditions identify the location and condition of all known asbestos-containing materials (ACM) to be disturbed by the work of this contract.

.4 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 ACM included in work of this section and all materials which have been contaminated by ACM either during or prior to work of this section.

1.2 Site Conditions

.1 Refer to the Hazardous Building Materials Assessment Report, prepared by Pinchin Ltd., dated January 31, 2019 for details on hazardous building materials present in the Work Area.

1.3 Outline of Work

.1 Coordinate the following items with the Construction Manager and Environment and Climate Change Canada (ECCC), which are to be included in the lump sum bid of the Abatement Contractor, including but not limited to: electrical isolations, GFI connection, water connections, hoarding walls, bin placement, hours of work, schedule, etc.

.2 Contractor to verify actual site conditions during the site visit walkthrough, prior to tender, and base tender price on conditions and quantities found. Coordinate all phasing of work with ECCC or the Construction Manager. No extras for variations in quantities or phasing of work/work areas will be accepted.

.3 Using Type 2 procedures of this section, remove and dispose of the following:

.1 Exterior cladding, as required, to access the interior of the Rooftop Penthouse (Location 15).

.2 Asbestos-containing pipe and/or duct insulations and debris in the Rooftop Penthouse (Location 15). Use High Risk/Type 3 procedures, as outlined in Section 02 82 12, where the removal exceeds 1 meter squared of friable material. Glove Bag procedures, as outlined in Section 02 82 13, can be used where access allows.

.4 Follow the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014) during disturbance of all paint. Special precautions are not required unless aggressive disturbance (grinding, blasting, torching, and welding) is planned of paints in the renovation areas that contain

low levels of lead (i.e., less than the Surface Coating Materials Regulatory cut-off of 0.009% for lead-containing paints). Complete the following:

.1 Remove paint where cutting of steel will occur.

.2 Remove paint where it may be disturbed by the work or follow lead procedures as outlined in the EACO guideline.

.5 Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with provincial standards or guidelines.

.1 Silica work is to be completed in accordance with the Ontario Ministry of Labour Guideline: Silica on Construction Projects, September 2004 (revised 2011).

1.4 Schedule

.1 Coordinate all work, scheduling and phasing with the Construction Manager and ECCC.

1.5 Definitions

.1 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.

.2 Asbestos Abatement Consultant: Owner's Representative providing inspection and air monitoring.

.3 Asbestos Abatement Contractor: Contractor or sub-contractor performing work of this section.

.4 Asbestos-Containing Material(s) (ACM): Material(s) identified under Site Conditions including debris, fallen material and settled dust.

.5 Asbestos Work Area: Area where work takes place which will, or may, disturb ACM.

.6 Authorized Visitors: Prime Contractor, Building Owner or Representatives, Asbestos Abatement Consultant, and persons representing regulatory agencies.

.7 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with Regulation 278/05 and the Occupational Health and Safety Act, and has knowledge of the potential or actual danger to health and safety in the work.

.8 DOP Testing (or HEPA Integrity Test): Testing performed on HEPA Filtered Negative Pressure Machines and HEPA vacuums using DOP or equivalent. Testing shall ensure that total penetration from the unit does not exceed 0.03%, or 99.97% efficient of airborne particulate removal. DOP Testing must be in compliance with ASME N510-1989 (1995) and must be performed using a Temporary Mixing Chamber with installed baffles to allow uniform mixing of challenge aerosol.

.9 Fitting: Section of pipe other than straight uninterrupted sections including elbows, valves, tees, hangers, nipples, union or ends.

.10 Friable Material: means a material when dry can be crumbled, pulverized or powdered by hand pressure or is crumbled, pulverized or powdered.

.11 HEPA Filter: High Efficiency Particulate Arresting filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.

.12 PCM: Phase Contrast Microscopy.

.13 Polyethylene: Either polyethylene sheeting or rip-proof polyethylene sheeting (as specified) with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect underlying surfaces from damage, and to prevent escape of asbestos fibres through sheeting into Occupied Areas.

.14 Occupied Area: Any area of the building outside the Asbestos Work Area.

.15 Personnel: All contractor's employees, sub-contractor's employees, supervisors.

.16 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g. remove and turn over to Owner).

.17 TEM: Transmission Electron Microscopy.

1.6 Submittals

.1 Submit prior to starting work:

.1 Schedule.

.2 Workplace Safety and Insurance Board Clearance Certificate.

.3 Insurance certificates.

.4 Copy of Company Health and Safety Policy and applicable programs.

.5 Ministry of Labour Notice of Project form.

.6 Copy of Certificate of Approval for disposal of asbestos waste and location of landfill.

.7 Pre-removal survey of damage in all areas where asbestos abatement will take place or waste will be transported.

.2 Submit the following information regarding personnel prior to starting work:

.1 Resumes of the supervisory personnel.

.2 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal (2 day minimum duration) or are certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.

.3 WHMIS training certificates for all personnel.

.4 Written statement that personnel have had instruction on hazards of asbestos exposure, the use of respirator, protective clothing, worker and waste decontamination procedures, use of Glove Bags and all aspects of work procedures and protective measures.

.5 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.

.3 Submit the following information regarding HEPA filtered devices prior to construction of enclosure or asbestos abatement:

.1 Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old.

.2 Performance data on negative air units including DOP tests which must be no more than 3 months old if the unit is vented outdoors or which must be performed on site immediately prior to initial usage and when HEPA filters are changed or the unit is vented indoors.

.3 DOP tests to be performed by an independent testing company.

.1 DOP testing company is required to submit a detailed technical report of testing protocol, including Introduction, Methodology, Results, Conclusions, and Recommendations, including results of the Air-Aerosol Mixing Uniformity test as per ASME N510-1989 (1995).

.2 DOP testing company must also provide calibration certificates from an independent calibration firm or from the manufacturer of the testing equipment for both the aerosol photometer and the pressure gauge on the aerosol generator dated within 1 calendar year from the on-site testing date.

.3 DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing.

.4 Proof of calibration of DOP testing equipment.

.4 Submit the following prior to isolating the work area:

.1 Written statement that the Ground Fault Interrupter Panels use CSA approved parts and have been inspected by the Electrical Safety Authority.

.2 Material Safety Data Sheets for chemicals or material used in the course of the Asbestos Abatement Project.

.5 Submit the following upon completion of the work.

.1 Manifests, waybills, bills of ladings etc. as applicable for each type of waste.

1.7 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. Regulations include but are not limited to the following:

.2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.

.3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.

.4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

1.8 Supervision

.1 Provide onsite, a supervisor, with authority to oversee all aspects of the work, including but not limited to, health and safety, methods, scheduling, labour and equipment requirements.

.2 The supervisor must be on site at all times during work at risk of disturbing ACM. Failure to comply with this requirement may result in a stoppage of work, at no cost to ECCC.

.3 Provide a minimum of one supervisor for every 10 workers.

.4 Replace supervisory personnel, with approved replacements, within 3 working days of a written request from the Asbestos Abatement Consultant. Asbestos Abatement Consultant reserves the right to request replacement of supervisory personnel without explanation.

.5 Do not replace supervisory personnel without written approval from the Asbestos Abatement Consultant.

1.9 Quality Assurance

.1 Ensure the removal and handling of ACM or asbestos contaminated materials is performed by persons experienced in the methods, procedures and industry practices of asbestos abatement.

.2 Complete work so that at no time airborne asbestos, visible solid residue, or water runoff contaminates areas outside Asbestos Work Area. Asbestos Abatement Consultant is empowered to order a shutdown of work when a leak has occurred or is likely to occur. Cost of additional work by Asbestos Abatement Contractor and/or Asbestos Abatement Consultant to rectify unsatisfactory conditions shall be charged to the Asbestos Abatement Contractor.

.3 Perform all work involving other trades such as electrical, mechanical, carpentry, glazing etc. using licensed persons experienced and qualified for the work required.

.4 The Asbestos Abatement Consultant 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 Asbestos Abatement Consultant will not be responsible for or have control or charge over the acts or omissions of the Asbestos Abatement Contractor, his Subcontractors or their agents, employees or other persons performing any of the Work.

1.10 Notification

.1 Notify Sanitary Landfill site as per Ontario Regulation 347 as amended.

.2 Inform all sub trades of the presence of ACM identified in the contract documents.

.3 Notify ECCC or Owners Representative, the Joint Occupational Health and Safety Committee and the Ontario Ministry of Labour, as required by Regulation 278/05, if friable materials not identified in the contract documents are discovered during the course of the work. Stop work in these areas immediately.

1.11 Insurance

.1 Maintain a Commercial General Liability Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Commercial General Liability insurance shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period.

.2 Maintain an Automobile or Fleet Policy, and Non-owned Automobile Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of these policies is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract.

.3 Maintain a Pollution Liability Policy (or asbestos liability policy or specific coverage under the CGL for asbestos abatement) with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Pollution Liability shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period. Without limiting the generality of the foregoing, the policy shall insure the operations of asbestos abatement and shall not contain any environmental and/or health hazard exclusions relating to remediation operations including asbestos abatement.

.4 Forward all certificates to Pinchin Ltd. and ECCC before work is commenced, showing Pinchin Environmental Ltd and ECCC as additional insured as their interest may appear.

.5 ECCC may request a certified true copy of the policies.

.6 The limits will not be less than:

.1	Commercial General Liability	$5,000,000.00
.2	Automobile	$2,000,000.00
.3	Pollution Policy (Asbestos Liability)	$5,000,000.00

1.12 Instruction and Training

.1 Provide instruction and training to all workers including the following:

.1 Hazards of asbestos.

.2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that would be used and worn during abatement work, including:

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

.3 Personal hygiene to be observed when performing the work.

.4 The measures and procedures prescribed by this section including decontamination of the worker.

.5 Instruction and training must be provided by a competent person.

1.13 Personal Protection

.1 Protect all personnel at all times when possibility of disturbance of ACM exists.

.2 Provide workers with full-face respirators with P100 high efficiency (HEPA) cartridge filters during the use of HEPA filtered power tools to remove or disturb other non-friable ACM, if applicable.

.3 Provide workers, at a minimum, with non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters for all other work of this section.

.4 Respirators shall be:

.1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.

.2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.

.3 Assigned to a worker for their exclusive use.

.4 Maintained in accordance with manufacturer's specifications.

.5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.

.6 Repaired or have damaged or deteriorated parts replaced.

.7 Stored in a clean and sanitary location.

.8 Provided with new filters as necessary, according to manufacturer's instructions.

.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.

.9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.5 Provide protective clothing, to all personnel which:

.1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.

.2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.

.3 Is replaced or repaired if torn or ripped.

.4 Is disposed of as ACM.

.6 Decontaminate clothing or protective clothing by using a HEPA Vacuum, or by damp wiping prior to leaving the Asbestos Work Area:

.7 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

.8 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Asbestos Work Area.

.9 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

1.14 Authorized Visitor Protection

.1 Provide clean protective clothing and equipment, and approved respirators to Authorized Visitors.

.2 Ensure Authorized Visitors have received required training prior to granting entry into Asbestos Work Area.

1.15 Air Monitoring

.1 Air monitoring will be performed following the National Institute for Occupational Safety and Health method 7400, Asbestos and other fibres by PCM (Phase Contrast Microscopy).

.2 Co-operate with the Asbestos Abatement Consultant in collection of air samples, including providing workers to wear sampling pumps for up to full-shift periods. Asbestos Abatement Contractor to exercise care with Asbestos Abatement Consultant's equipment. ECCC reserves the right to back-charge the Asbestos Abatement Contractor for further collection of samples damaged by tampering or abuse. In addition, the Asbestos Abatement Contractor will be responsible for the cost of testing equipment repairs resulting from the actions of the Asbestos Abatement Contractor's forces.

.3 Results of air monitoring of 0.05 fibres per cubic centimetre of air (fibre/cc) or greater, outside of Asbestos Work Area, will indicate asbestos contamination of these areas and result in the following actions:

.1 Suspend Work within the adjoining Asbestos Work Area until written authorization to resume Work has been received from the Asbestos Abatement Consultant.

.2 Isolate and clean area in the same manner applicable to the Asbestos Work Area.

.3 Maintain Work area isolation, and repeat clean-up operations until visual inspection and air monitoring results are at a level equal to that specified.

.4 Install additional negative air units at locations specified in response to elevated fibre levels being detected in the Clean Change Room or Occupied Areas at the discretion of the Asbestos Abatement Consultant.

.4 Perform the following when results of PCM monitoring within the Asbestos Work Area show airborne fibre levels have exceeded the respirator protection factor:

.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 personal decontamination procedures.

.3 Contractor's forces shall not re-enter the Asbestos Work Area until authorized by the Asbestos Abatement Consultant.

.4 Upon re-entry to the Asbestos Work Area, mist any fallen debris or exposed surfaces with amended water using an airless sprayer.

.5 If PCM monitoring shows repeated failure, change respiratory protection to suitable alternative and change unsatisfactory methods used.

.5 Cost of additional inspection and sampling performed as a result of elevated fibre levels may be charged to the Asbestos Abatement Contractor at the Owner's discretion.

1.16 Inspection

.1 From commencement of work until completion of clean-up operations, the Asbestos Abatement Consultant may be present periodically on site both inside and outside the Asbestos Work Area.

.2 The following Milestone Inspections will take place, at the Owner' cost:

.1 Milestone Inspection A - Clean Site Preparation

.1 Inspection of preparations and set-up prior to contaminated work in the Asbestos Work Area.

.2 Milestone Inspection D - Visual Clearance

.1 Inspection of Asbestos Work Area after removal of all asbestos, but prior to application of lock-down agent.

.3 Do not proceed with next phase of Work until written approval of each milestone is received from the Asbestos Abatement Consultant.

.4 In addition to the Milestone Inspections, inspection of the Asbestos Work Area may be performed to confirm the Asbestos Abatement Contractor's compliance with the requirements of the contract documents and governing authorities. Any deviations from these requirements that have not been approved in writing, may result in a stoppage of work, at no additional cost to the Owner.

.5 The Asbestos Abatement Consultant is empowered by ECCC to inspect for final cleanliness at completion. Additional labour or materials expended by the Asbestos Abatement Contractor to provide satisfactory performance to the level specified shall be at no additional cost.

.6 Inspection and air monitoring performed as a result of Asbestos Abatement Contractor's failure to perform satisfactorily regarding quality, safety, or schedule may be charged to the Asbestos Abatement Contractor at ECCC's discretion.

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 All materials and equipment brought to work site must be in good condition and free of asbestos, asbestos debris, and fibrous materials.

.2 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.

.3 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.

.4 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:

.1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.

.2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.

.3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.

.5 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.

.6 Discharge Ducting: Polyethylene Tubing. Reinforced with wire. Diameter to equal negative pressure machine discharge. Not to be longer than required, or so long that negative pressure is compromised.

.7 Ground Fault Panel: Electrical panel as follows:

.1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical equipment and lights in Asbestos Work Area.

.2 Interrupters to have a 5 mA ground fault protection.

.3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.

.4 Openings sealed to prevent moisture or dust penetration.

.5 Inspected by the Electrical Safety Authority.

.6 Panel uses CSA approved parts and been constructed, inspected and installed by a licensed electrician.

.8 HEPA Filtered Negative Pressure Machine: Portable air handling system which extracts air directly from the Asbestos Work Area and discharges the air to the exterior of the building. Equipped as follows:

.1 Prefilter and HEPA filter. Air must pass HEPA filter before discharge.

.2 Pressure differential gauge to monitor filter loading.

.3 Auto shut off and warning system for HEPA filter failure.

.4 Separate hold down clamps to retain HEPA filter in place during change of prefilter.

.9 OSB: Oriented Strand Board.

.10 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.

.11 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.

.12 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.

.13 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.

.14 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.

.15 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

.16 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

2.2 Transfer Room

.1 Transfer Room to be generally 2000 mm x 2000 mm x 2200 mm high. Increase size accordingly to accommodate number of workers.

.2 Install walls as follows:

.1 Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates.

.2 Install one layer rip-proof polyethylene sheeting on interior walls of Transfer Room.

.3 Install one layer of rip-proof polyethylene sheeting over one layer of 6 mil polyethylene sheeting beneath entire Transfer Room.

.4 Install one layer rip-proof polyethylene sheeting over roof.

.5 Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls.

.6 Install a fire extinguisher, mount to wall.

2.3 Curtained Doorways

.1 Construct as follows:

.1 Install two flap doors, full width and height of door opening at all doors to Asbestos Work Area and both ends of Transfer Room.

.2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head and alternate jambs.

.3 Install weights attached to bottom edge of each door flap.

.4 Provide direction arrows on flaps to indicate opening.

2.4 Signage

.1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area and on hoarding walls as follows:

.1 CAUTION.

.2 Asbestos Dust Hazard Area.

.3 Unauthorized Entry Prohibited.

.4 Wear Assigned Protective Equipment.

.5 Breathing Asbestos Dust May Cause Serious Bodily Harm.

.2 Vehicles, Bins and Asbestos Waste Containers: Post signs on both sides of every vehicle used for the transportation of asbestos waste and on every asbestos waste container. Signs must display thereon in large, easily legible letters that contrast in colour with the background the word "CAUTION" in letters not less than ten centimetres in height and the words:

.1 CONTAINS ASBESTOS FIBRES

.2 Avoid Creating Dust and Spillage

.3 Asbestos May be Harmful To Your Health

.4 Wear Approved Protective Equipment.

.3 Place placards in accordance with Transportation of Dangerous Goods Act.

PART 3 EXECUTION

3.1 Site Preparation - General

.1 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.

.2 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 Procedures as required by O. Reg. 278/05.

.3 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 to clearly mark exit route. Seal emergency exit doors so as not to impede use of door during emergency evacuation.

.4 Isolate, at panel, and disconnect existing power supply to Asbestos Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.

.1 Lock-out/tag-out power at electrical panels.

.2 Mark/tag any items within or passing through the Asbestos Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.

.5 Shut down HVAC systems serving the Asbestos Work Area.

.1 Install polyethylene sheeting over openings in ducts and diffusers and seal.

.2 Perform work at scheduled times after shutting down HVAC systems affecting the Asbestos Work Area.

.6 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc.).

.1 Provide power from ground fault interrupt circuits as follows:

.1 Use CSA approved ground fault interrupt outlets outside the Asbestos Work Area to provide power to equipment within the enclosure.

.2 All electrical equipment used during work shall be supplied power from a Ground Fault Panel.

3.2 Site Preparation – Enclosure Required

.1 Install polyethylene enclosure complete with Windows at Asbestos Work Areas in which the abatement of friable asbestos-containing materials (less than 1 square metre) is performed, and the removal of a false ceiling (or part of) where asbestos-containing sprayed fireproofing dust and debris is present above.

.2 Install Transfer Room where duration of work is to last longer than one 8 hour shift.

.3 Install Curtained Doorways.

.4 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

.5 Install polyethylene sheeting at openings in walls (as required) and seal.

.6 Install polyethylene sheeting on porous materials that cannot be cleaned.

.7 Install 6 mil polyethylene sheeting on walls within the Asbestos Work Area, where walls are not present and on materials that cannot be cleaned, including existing walls that make up, or are within, the Asbestos Work Area.

.8 Place required tools to complete the abatement with the Asbestos Work Area.

.9 Provide a completely sealed polyethylene top for free standing enclosures.

.10 Extend to underside of ceiling system, enclosures for access into ceilings. Enclosure may be supported from the ceiling system if ceiling can support the polyethylene.

.11 Install temporary lighting in enclosure to a level that will provide for safe and efficient use of work area - minimum 550 LUX.

.12 Establish negative pressure in Asbestos Work Areas as follows:

.1 Use HEPA Vacuum.

.2 Insert vacuum hose into enclosure, leave HEPA vacuum outside enclosure. Provide enough hose to reach all areas of enclosure.

.3 Operate HEPA vacuum continuously at all times when ACM may be disturbed.

3.3 Site Preparation – No Enclosure Required

.1 Cover walls, floors, finishes, millwork, equipment and furnishings remaining in the Asbestos Work Area with polyethylene drop sheets before disturbing ACM to control the spread of dust.

.2 Install caution tape around work area where existing walls are not present.

.3 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

.4 Install temporary lighting in enclosure to a level that will provide for safe and efficient use of work area - minimum 550 LUX.

.5 Place HEPA vacuum in Asbestos Work Area.

.6 Place required tools to complete the abatement with the Asbestos Work Area.

3.4 Maintenance of Asbestos Work Area

.1 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.

.2 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Asbestos Work Area.

.3 Inspect HEPA filtered negative pressure machines including discharge ducting at the beginning and end of each working period. Inspection must be performed by competent person.

.4 Maintain Asbestos Work Area in tidy condition.

.5 Remove standing water on polyethylene/floor at the end of every shift.

.6 Turn off water supply to any hoses and reduce pressure in hose, prior to leaving the Asbestos Work Area at end of shift.

3.5 Asbestos Removal - General

.1 Do not use compressed air to clean or remove dust or debris.

.2 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.

.3 Frequently and at regular intervals, place all waste in asbestos waste containers.

.4 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.6 Asbestos Removal - Mechanical Insulation (less than 1 Square Metre)

.1 Construct an enclosure around asbestos work area and use the procedures described above under *Site Preparation – Enclosure Required*.

.2 Seal entry to the Asbestos Work Area with tape when workers enter the Asbestos Work Area. Worker to remain inside the Asbestos Work Area until work disturbing ACM is complete and enclosure has been cleaned.

.3 Use only hand-held non-powered tools.

.4 Saturate exterior of the ACM with amended water.

.5 Remove asbestos-containing mechanical insulations in layers, maintaining all exposed surfaces of insulation in a wet condition.

.6 Remove wetted ACM directly into waste containers. Do not allow ACM to fall to the floor of the Asbestos Work Area.

.7 Clean all surfaces from which ACM has been removed with scouring pads, vacuuming or wet-sponging to remove all visible material after completion of removal of ACM.

.8 Remove visible dust and debris.

.9 Seal exposed ends of asbestos-containing pipe insulation with 6 oz. canvas and lagging.

.10 HEPA vacuum or wet clean entire Asbestos Work Area, including any surfaces not covered with polyethylene sheeting. Any materials removed to access ACM that are to be re-used, and any abatement equipment, must be wet cleaned or HEPA vacuumed prior to completion.

.11 Apply Post Removal Sealant to all surfaces within the Asbestos Work Area including those from which ACM has been removed.

3.7 Asbestos Removal - Dust and Debris

.1 Use the procedures described above under *Site Preparation – No Enclosure Required*.

.2 Remove visible dust and debris from Asbestos Work Area using HEPA vacuums or wet cleaning methods.

.3 Wet clean or HEPA vacuum the entire Asbestos Work Area, including surfaces not covered with polyethylene sheeting (e.g. ceiling grid). Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.8 Waste and Material Handling

.1 Waste bins must be placed on grade or in receiving.

.2 All bins must be covered and locked when waste transfer is not being performed.

.3 Ensure redundant non-ACM, rubble, debris, etc. removed during contaminated work are treated, packaged, transported and disposed of as asbestos waste.

.4 Clean, wash and apply Post Removal Sealant to metal waste prior to removal from Asbestos Work Area. Recycle metals or dispose of metals as clean waste.

.5 Clean, wash and apply Post Removal Sealant to non-porous materials prior to disposal as clean waste. Obtain prior written approval from the Asbestos Abatement Consultant for each individual type of material.

.6 Clean and wash equipment prior to removal from Asbestos Work Area if removed prior to completion.

.7 Place all equipment, tools and unused materials that cannot be cleaned in Asbestos Waste Containers.

.8 As work progresses, and at regular intervals, transport the sealed and labelled asbestos waste containers from the Asbestos Work Area to waste bin.

.9 Place items in bins according to waste classification. Place asbestos waste, metals, non-asbestos waste, etc. in separate bins.

.10 Removal of waste containers and decontaminated tools and materials from the Asbestos Work Area shall be performed as follows:

.1 Remove any visible contamination from the surface of non-porous or cleanable waste being removed from the Asbestos Work Area. If the item can be cleaned, remove it from the site as clean waste.

.2 Place waste or item in Asbestos Waste Container and seal closed.

.3 Wet wipe outside of Asbestos Waste Container.

.4 Within Transfer Room or at the perimeter of the Asbestos Work Area, place in second Asbestos Waste Container. Seal closed.

.5 Remove the item from the Asbestos Work Area.

.11 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.

.12 Limit transportation of waste and materials through Occupied Areas of the building to Quiet Hours.

.13 Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled ACM in the case of a rupture of an Asbestos Waste Container.

.14 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owner's operations.

.15 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

.16 Co-operate with Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

3.9 Application of Post Removal Sealant

.1 Obtain Asbestos Abatement Consultant's written permission to proceed.

.2 Apply one coat of Post Removal Sealant with an airless sprayer, in accordance with Manufacturer's Instructions, to cover all surfaces on all items in the Asbestos Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition.

.3 Notify Pinchin Ltd. at least 24 hours prior to the need for Milestone Inspection E (Air Monitoring Clearance). Obtain written approval of this Milestone Inspection before proceeding.

3.10 Clean-Up and Dismantling

.1 Wash or HEPA vacuum equipment used in Asbestos Work Area.

.2 Wash remaining equipment and tools used in contaminated Asbestos Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Asbestos Work Area.

.3 Clean polyethylene sheeting and drop sheets with HEPA vacuum or wet cleaning methods at completion of work.

.4 Wet drop sheets and polyethylene sheeting.

.5 Carefully roll polyethylene sheeting on floors or drop sheets toward the centre of enclosure. As polyethylene is rolled away, immediately remove visible debris beneath with a HEPA vacuum.

.6 Remove and dispose of polyethylene sheeting as asbestos waste.

.7 Remove remaining site isolation, seals, tape, etc.

.8 Remove Transfer Room.

.9 Remove seals, tape, Signage etc.

.10 Remove and dispose of the pre-filters from HEPA filtered negative pressure machines as asbestos-contaminated waste.

.11 Remove temporary lights.

.12 Remove HEPA filtered negative pressure machines and discharge ducting or HEPA vacuums.

.13 Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.

.14 Seal openings in HEPA vacuums.

.15 Place contaminated materials including polyethylene sheeting, drop sheets, seals, tape, disposable coveralls, and other contaminated waste in asbestos waste containers.

END OF SECTION

PART 1 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 Division 1 and the General Conditions of the Contract.

.2 Related Work Specified Elsewhere

Division 13,	Section 02 82 10	Asbestos Abatement - Low Risk/Type 1
Division 13,	Section 02 82 11	Asbestos Abatement - Moderate Risk/Type 2
Division 13,	Section 02 82 13	Asbestos Abatement - Glove Bag
Division 13,	Section 02 84 10	Mercury Lamps and PCB Ballasts

.3 The site conditions identify the location and condition of all known asbestos-containing materials (ACM) to be disturbed by the work of this section.

.4 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 ACM included in work of this section and all materials which have been contaminated by ACM either during or prior to work of this section.

1.2 Site Conditions

.1 Refer to the Hazardous Building Materials Assessment Report, prepared by Pinchin Ltd., dated January 31, 2019 for details on hazardous building materials present in the Work Area.

1.3 Outline of Work

.1 Coordinate the following items with the Construction Manager and Environment and Climate Change Canada (ECCC), which are to be included in the lump sum bid of the Abatement Contractor, including but not limited to: electrical isolations, GFI connection, water connections, hoarding walls, bin placement, hours of work, schedule, etc.

.2 Contractor to verify actual site conditions during the site visit walkthrough, prior to tender, and base tender price on conditions and quantities found. Coordinate all phasing of work with ECCC or the Construction Manager. No extras for variations in quantities or phasing of work/work areas will be accepted.

.3 Using Type 3 procedures, remove and dispose of the following:

.1 Non-asbestos plaster ceilings, bulkheads, grids, support systems, walls, and column enclosures, as required to access pipe insulation above the ceiling in the Basement Storage Room (Location 9).

.2 Asbestos-containing debris from pipe insulations present on top of the plaster ceiling in the Basement Storage Room (Location 9).

.3 Asbestos-containing pipe insulation in the Basement Storage Room (Location 9).

.4 Non-asbestos plaster ceilings, bulkheads, grids, support systems, walls, pipe and duct chases and column enclosures, and asbestos-containing pipe insulation and debris above or behind solid finishes in the following locations:

.1 Ground Floor Washroom (Location 1);

.2 Ground Floor Kitchen (Location 2); and

.3 Ground Floor Corridor (Location 3).

.4 Follow the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014) during disturbance of all paint. Special precautions are not required unless aggressive disturbance (grinding, blasting, torching, and welding) is planned of paints in the renovation areas that contain low levels of lead (i.e., less than the Surface Coating Materials Regulatory cut-off of 0.009% for lead-containing paints). Complete the following:

.1 Remove paint where cutting of steel will occur.

.2 Remove paint where it may be disturbed by the work or follow lead procedures as outlined in the EACO guideline.

.5 Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with provincial standards or guidelines.

.1 Silica work is to be completed in accordance with the Ontario Ministry of Labour Guideline: Silica on Construction Projects, September 2004 (revised 2011).

1.4 Schedule

.1 Coordinate all work, scheduling and phasing with the Construction Manager and ECCC.

1.5 Definitions

.1 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.

.2 Asbestos Abatement Consultant: Owner's Representative providing inspection and air monitoring.

.3 Asbestos Abatement Contractor: Contractor or sub-contractor performing work of this section.

.4 Asbestos-Containing Material(s) (ACM): Material(s) identified under Site Conditions including debris, fallen material and settled dust.

.5 Asbestos Work Area: Area where work takes place which will, or may, disturb ACM.

.6 Authorized Visitors: Prime Contractor, Building Owner or Representatives, Asbestos Abatement Consultant, and persons representing regulatory agencies.

.7 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with Regulation 278/05 and the Occupational Health and Safety Act, and has knowledge of the potential or actual danger to health and safety in the work.

.8 DOP Testing (or HEPA Integrity Test): Testing performed on HEPA Filtered Negative Pressure Machines and HEPA vacuums using DOP or equivalent. Testing shall ensure that total penetration from the unit does not exceed 0.03%, or 99.97% efficient of airborne particulate removal. DOP Testing must be in compliance with ASME N510-

1989 (1995) and must be performed using a Temporary Mixing Chamber with installed baffles to allow uniform mixing of challenge aerosol.

.9 Fitting: Section of pipe other than straight uninterrupted sections including elbows, valves, tees, hangers, nipples, union or ends.

.10 Friable Material: means a material when dry can be crumbled, pulverized or powdered by hand pressure or is crumbled, pulverized or powdered.

.11 HEPA Filter: High Efficiency Particulate Arresting filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.

.12 Polyethylene: Either polyethylene sheeting or rip-proof polyethylene sheeting (as specified) with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect underlying surfaces from damage, and to prevent escape of asbestos fibres through sheeting into Occupied Areas.

.13 PCM: Phase Contrast Microscopy

.14 Personnel: All contractors' employees, sub-contractors' employees, supervisors.

.15 Occupied Area: Any area of the building outside the Asbestos Work Area.

.16 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g. remove and turn over to Owner).

.17 TEM: Transmission Electron Microscopy

1.6 Submittals

.1 Submit prior to starting work:

.1 Schedule.

.2 Workplace Safety and Insurance Board Clearance Certificate.

.3 Insurance certificates.

.4 Copy of Company Health and Safety Policy and applicable Programs.

.5 Ministry of Labour Notice of Project form.

.6 Copy of Certificate of Approval for transportation of asbestos waste and location of landfill.

.7 Pre-removal survey of damage in all areas where asbestos abatement will take place or waste will be transported.

.2 Submit the following information regarding personnel prior to starting work:

.1 Resumes of the supervisory personnel.

.2 Proof in the form of a certificate that supervisory personnel have been certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.

.3 Proof in the form of a certificate that workers have been certified under the Ministry of Training, Colleges and Universities course 253W.

.4 WHMIS training certificates for all personnel.

.5 Certificate proving that each worker or supervisor on site has been fit tested for the respirator appropriate for the work being performed.

.3 Submit the following information regarding HEPA filtered devices prior to construction of enclosure or asbestos abatement:

.1 Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old.

.2 Performance data on negative air units including DOP tests which must be no more than 3 months old if the unit is vented outdoors or which must be performed on site immediately prior to initial usage and when HEPA filters are changed or the unit is vented indoors.

.3 DOP tests to be performed by an independent testing company.

.1 DOP testing company is required to submit a detailed technical report of testing protocol, including Introduction, Methodology, Results, Conclusions, and Recommendations, including results of the Air-Aerosol Mixing Uniformity test as per ASME N510-1989 (1995).

.2 DOP testing company must also provide calibration certificates from an independent calibration firm or from the manufacturer of the testing equipment for both the aerosol photometer and the pressure gauge on the aerosol generator dated within 1 calendar year from the on-site testing date.

.3 DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing.

.4 Submit the following prior to isolating the work area:

.1 Written statement that the Ground Fault Interrupter Panels use CSA approved parts and have been inspected by the Electrical Safety Authority.

.2 Material Safety Data Sheets for chemicals or material used in the course of the Asbestos Abatement Project.

.5 Submit the following upon completion of the work.

.1 Manifests, waybills, bills of ladings etc. as applicable for each type of waste.

1.7 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. Regulations include but are not limited to the following:

.2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.

.3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.

.4 Ministry of Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

1.8 Supervision

.1 Provide onsite, a supervisor, with authority to oversee all aspects of the work, including but not limited to, health and safety, methods, scheduling, labour and equipment requirements.

.2 The supervisor must be on site at all times during work at risk of disturbing ACM. Failure to comply with this requirement may result in a stoppage of work, at no cost to the Owner.

.3 Provide a minimum of one supervisor for every 10 workers.

.4 Replace supervisory personnel, with approved replacements, within 3 working days of a written request from the Asbestos Abatement Consultant. Asbestos Abatement Consultant reserves the right to request replacement of supervisory personnel without explanation.

.5 Do not replace supervisory personnel without written approval from the Asbestos Abatement Consultant.

1.9 Quality Assurance

.1 Ensure the removal and handling of ACM or asbestos-contaminated materials is performed by persons experienced in the methods, procedures and industry practices of asbestos abatement.

.2 Complete work so that at no time airborne asbestos, visible solid residue, or water runoff contaminates areas outside Asbestos Work Area. Asbestos Abatement Consultant is empowered to order a shutdown of work when a leak has occurred or is likely to occur. Cost of additional work by Asbestos Abatement Contractor and/or Asbestos Abatement Consultant to rectify unsatisfactory conditions shall be charged to the Asbestos Abatement Contractor.

.3 Perform all work involving other trades such as electrical, mechanical, carpentry, glazing etc. using licensed persons experienced and qualified for the work required.

.4 The Asbestos Abatement Consultant 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 Asbestos Abatement Consultant will not be responsible for or have control or charge over the acts or omissions of the Asbestos Abatement Contractor, his Subcontractors or their agents, employees or other persons performing any of the Work.

1.10 Notification

.1 Before commencing work, notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site.

.2 Notify Sanitary Landfill site as per Ontario Regulation 347 as amended.

.3 Inform all sub trades of the presence of ACM identified in the contract documents.

.4 Notify the Owner or Owners Representative, the Joint Occupational Health and Safety Committee and the Ontario Ministry of Labour, as required by Regulation 278/05, if friable materials not identified in the contract documents are discovered during the course of the work. Stop work in these areas immediately.

1.11 Insurance

.1 Maintain a Commercial General Liability Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Commercial General Liability insurance shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period.

.2 Maintain an Automobile or Fleet Policy, and Non-owned Automobile Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of these policies is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract.

.3 Maintain a Pollution Liability Policy (or asbestos liability policy or specific coverage under the CGL for asbestos abatement) with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Pollution Liability shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period. Without limiting the generality of the foregoing, the policy shall insure the operations of asbestos abatement and shall not contain any environmental and/or health hazard exclusions relating to remediation operations including asbestos abatement.

.4 Forward all certificates to Pinchin Ltd. and ECCC before work is commenced, showing Pinchin Ltd. and ECCC as additional insured as their interest may appear.

.5 ECCC may request a certified true copy of the policies.

.6 The limits will not be less than:

.1	Commercial General Liability	$5,000,000.00
.2	Automobile	$2,000,000.00
.3	Pollution Policy (Asbestos Liability)	$5,000,000.00

1.12 Personal Protection

.1 Protect all personnel at all times when possibility of disturbance of ACM exists.

.2 Provide the following respiratory protection to all personnel:

.1 Full Face Powered Air Purifying Respirators with P100 high efficiency (HEPA) cartridge filters during projects when performing wet abatement of sprayed fireproofing or texture coat containing chrysotile asbestos, or wet abatement of other non-surfacing asbestos-containing material specified in this section.

.2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters for dismantling of Type 3 enclosures, using Type 2 Procedures.

.3 Respirators shall be:

.1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.

.2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.

.3 Assigned to a worker for their exclusive use.

.4 Maintained in accordance with manufacturer's specifications.

.5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.

.6 Repaired or have damaged or deteriorated parts replaced.

.7 Stored in a clean and sanitary location.

.8 Provided with new filters as necessary, according to manufacturer's instructions.

.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.

.9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.4 Provide protective clothing, to all personnel which:

.1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.

.2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.

.3 Is replaced or repaired if torn or ripped.

.4 Is disposed of as ACM.

.5 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

.6 Provide site specific instruction to workers before allowing entry to Asbestos Work Area. Instruction shall include training on entry and exit from Asbestos Work Areas. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.7 Provide soap, shampoo and towels for use by all personnel when leaving the Asbestos Work Area.

.8 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area and Decontamination Facilities.

1.13 Asbestos Abatement Work Area Entry Procedures

.1 Use the following procedure to enter contaminated Asbestos Work Area:

.1 Remove street clothes in Clean Change Room.

.2 Put on respirator with new or tested filters, and protective clothing in Clean Change Room or clean side of Shower Room.

.3 Store all street clothes, uncontaminated footwear, towels, etc. in the Clean Change Room.

1.14 Asbestos Abatement Work Area Exit Procedures

.1 Use the following procedure to exit contaminated Asbestos Work Area:

.1 Remove gross contamination from protective clothing using 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 shower 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. Remove 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.

.8 Maintain and disinfect respirator.

1.15 Authorized Visitor Protection

.1 Provide clean protective clothing and equipment, and approved respirators to Authorized Visitors.

.2 Ensure Authorized Visitors have received required training prior to granting entry into Asbestos Work Area.

1.16 Air Monitoring

.1 Air monitoring will be performed following the National Institute for Occupational Safety and Health method 7400, Asbestos and other fibres by PCM (Phase Contrast Microscopy).

.2 Co-operate with the Asbestos Abatement Consultant in collection of air samples, including providing workers to wear sampling pumps for up to full-shift periods. Asbestos Abatement Contractor to exercise care with Asbestos Abatement Consultant's equipment. The Owner reserves the right to back-charge the Asbestos Abatement Contractor for further collection of samples damaged by tampering or abuse. In addition, the Asbestos Abatement Contractor will be responsible for the cost of testing equipment repairs resulting from the actions of the Asbestos Abatement Contractor's forces.

.3 Results of air monitoring of 0.05 fibres per cubic centimetre of air (fibre/cc) or greater, outside of Asbestos Work Area, will indicate asbestos contamination of these areas and result in the following actions:

.1 Suspend Work within the adjoining Asbestos Work Area until written authorization to resume Work has been received from the Asbestos Abatement Consultant.

.2 Isolate and clean area in the same manner applicable to the Asbestos Work Area.

.3 Maintain Work area isolation, and repeat clean-up operations until visual inspection and air monitoring results are at a level equal to that specified.

.4 Install additional negative air units at locations specified in response to elevated fibre levels being detected in the Clean Change Room or Occupied Areas at the discretion of the Asbestos Abatement Consultant.

.4 Perform the following where results of air monitoring within the Asbestos Work Area show airborne fibre levels have exceeded the respirator protection factor:

.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 personal decontamination procedures.

.3 Contractor's forces shall not re-enter the Asbestos Work Area until authorized by the Asbestos Abatement Consultant.

.4 Upon re-entry to the Asbestos Work Area, mist any fallen debris or exposed surfaces with amended water using an airless sprayer.

.5 If PCM monitoring shows repeated failure, change respiratory protection to suitable alternative and change unsatisfactory methods used.

.5 PCM samples will be collected from within the Asbestos Work Area, after the site has passed a visual inspection and an acceptable coat of post removal sealant has been applied. These airborne fibre levels *must not exceed* 0.01 fibre/cc, after forced air monitoring and PCM analysis (Air Monitoring Clearance Inspection). If these results show fibre levels in excess of 0.01 fibre/cc:

.1 Maintain Asbestos Work Area isolation.

.2 Re-clean entire Asbestos Work Area.

.3 Apply another acceptable coat of post removal sealant to exposed surfaces throughout the Work area.

.4 Repeat above measures until visually inspected and air monitoring results are at a level equal to that specified.

.5 Alternate to items 2-4 above, the Asbestos Abatement Contractor can pay for analysis of samples by Transmission Electron Microscopy (TEM). Laboratory performing TEM analysis is to be NVLAP accredited.

.6 Cost of additional inspection and sampling performed as a result of elevated fibre levels may be charged to the Asbestos Abatement Contractor at the Owner’s discretion.

1.17 Inspection

.1 From commencement of work until completion of clean-up operations, the Asbestos Abatement Consultant will be present periodically on site both inside and outside the Asbestos Work Area.

.2 The following Milestone Inspections will take place, at the Owner's cost:

.1 Milestone Inspection A - Clean Site Preparation

.1 Inspection of preparations and set-up prior to contaminated work in the Asbestos Work Area.

.2 Milestone Inspection D - Visual Clearance

.1 Inspection of Asbestos Work Area after removal of all asbestos, but prior to application of lock-down agent.

.3 Do not proceed with next phase of Work until written approval of each milestone is received from the Asbestos Abatement Consultant.

.4 In addition to the Milestone Inspections, inspection of the Asbestos Work Area may be performed to confirm the Asbestos Abatement Contractor's compliance with the requirements of the contract documents and governing authorities. Any deviations from these requirements that have not been approved in writing, may result in a stoppage of work, at no additional cost to the Owner.

.5 The Asbestos Abatement Consultant is empowered by the Owner to inspect for final cleanliness at completion. Additional labour or materials expended by the Asbestos Abatement Contractor to provide satisfactory performance to the level specified shall be at no additional cost.

.6 Inspection and air monitoring performed as a result of Asbestos Abatement Contractor's failure to perform satisfactorily regarding quality, safety, or schedule may be charged to the Asbestos Abatement Contractor at the Owner’s discretion.

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 All materials and equipment brought to work site must be in good condition and free of asbestos, asbestos debris, and fibrous materials.

.2 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.

.3 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.

.4 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:

.1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.

.2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.

.3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.

.5 Differential Pressure Monitor: a high precision instrument for measuring and controlling pressure differences in the low range, between the Asbestos Work Area and occupied

area. Acceptable Product: Magnehelic gauge (Cat. No. 2000-00) manufactured by Dwyer Instruments Inc. or equivalent. Calibrate regularly to manufacturer's instructions.

.6 Discharge Ducting: Polyethylene Tubing. Reinforced with wire. Diameter equal to negative pressure machine discharge. Not to be longer than required, or so long that negative pressure is compromised.

.7 Ground Fault Panel: Electrical panel as follows:

.1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical equipment and lights in Asbestos Work Area.

.2 Interrupters to have a 5 mA ground fault protection.

.3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.

.4 Openings sealed to prevent moisture or dust penetration.

.5 Inspected by the Electrical Safety Authority.

.6 Panel uses CSA approved parts and been constructed, inspected and installed by a licensed electrician.

.8 HEPA Filtered Negative Pressure Machine: Portable air handling system which extracts air directly from the Asbestos Work Area and discharges the air to the exterior of the building. Equipped as follows:

.1 Prefilter and HEPA filter. Air must pass HEPA filter before discharge.

.2 Pressure differential gauge to monitor filter loading.

.3 Auto shut off and warning system for HEPA filter failure.

.4 Separate hold down clamps to retain HEPA filter in place during change of prefilter.

.9 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining 0.3 micron spherical particles greater than 0.3 microns at 99.97% efficiency.

.10 Hose: Leak-proof, minimum busting strength of 200 PSI or greater if required, abrasion resistant covering, reinforcing, and machined-brass couplings. Maintained and tested. Hose to be temperature resistant if it is to carry domestic hot water.

.11 OSB: Oriented Strand Board.

.12 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.

.13 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.

.14 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly

at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.

.15 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.

.16 Shower Hose: Water lines for supply of hot & cold water to shower facilities to be rated for use at 200 PSI (1380 kPa) or twice the working pressure whichever is greater. Supply lines to be continuous and free of fittings, joints or couplings.

.17 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.

.18 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

.19 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

2.2 Decontamination Facilities

.1 Workers' Decontamination Facility: A decontamination facility comprised of three linked rooms, Contaminated Change Room, a Shower Room, and a Clean Change Room.

.1 Rooms, Occupied Areas and Asbestos Work Areas, shall be separated by curtained doorways at each door.

.2 Contaminated Change Room: Room between Shower Room and Asbestos Work Area.

.1 Locate on contaminated side of Shower Room.

.2 Install asbestos waste container for asbestos contaminated protective clothing.

.3 Install storage facilities for any personal protective equipment to be reused in Asbestos Work Area including boots, hard hats, etc., but excluding respirators.

.4 Install hooks and shelves as required for personal protective equipment.

.5 Minimum size of generally 2 m x 2 m. Increase size accordingly to accommodate number of workers.

.3 Shower Room: Room between Clean Change Room and Contaminated Change Room.

.1 Install one walk through shower unit for every six workers.

.2 Install constant supply of hot and cold water, controllable at each shower. Water supply must be sufficient to provide water at a minimum temperature of 40 degrees Celsius (maximum 50 degrees) in a volume required for all workers to properly decontaminate.

.1 Install individual hot and cold shut-off valves on water supply located on clean side of Shower Room. Connect shower to these valves.

.2 Install individual controls inside the shower to regulate water flow and temperature.

.3 Install rigid piping or Shower Hose with watertight connections for supply and drains.

.4 Install a sealed drip pan under and around the showers, 150 mm deep.

.5 Install sump pumps, sufficient for volume of waste shower water from showers and drip pan. Direct waste shower water to sanitary drains.

.6 Install ground fault protected power switch on clean side of shower for sump pumps, or timed for shut off.

.7 Provide adequate quantity of soap, shampoo, clean towels

.8 Install an Asbestos Waste Container for disposal of used respirator filters, on the contaminated side of the Shower Room.

.4 Clean Change Room: A room between the Shower Room and Occupied Areas.

.1 Install hooks and shelves on clean side of shower in clean Change Room for storage of respirators.

.2 Install lockers or hangers for workers' street clothes and personal belongings.

.3 Install hose bib on domestic cold water pipe for connection on clean side of Asbestos Work Area.

.4 Install electric hot water heater/tank for showers in decontamination facility.

.5 Provide ground fault protected power supply to hot water tanks, sump pump, battery chargers.

.6 Install a fire extinguisher, mount to wall.

.7 Minimum size of generally 2m x 2m. Increase size accordingly to accommodate number of workers.

.5 Waste and Equipment Decontamination Facility: Waste and Equipment Decontamination Facility comprised of three linked rooms: a Container Cleaning Room, a Holding Room and a Transfer Room.

.1 Purpose of Waste and Equipment Decontamination Facility is to provide a means to decontaminate asbestos waste containers, scaffolding, vacuums, and other tools and equipment and materials required in the Asbestos Work Area.

.2 Rooms, Occupied Areas and Asbestos Work Areas, shall be separated by curtained doorways at each door.

.6 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.

.7 Holding Room: Room between Container Cleaning Room and Transfer Room, of sufficient size to accommodate at least two asbestos waste containers and two workers double bagging waste, or for largest item of equipment used.

.1 Install a fire extinguisher mounted to wall.

.8 Transfer Room: Room between Holding Room and Occupied Area, acting as an air lock for the transfer of waste.

.9 Construction of Decontamination Facilities

.1 Install floor protection as follows:

.1 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting beneath entire decontamination facility.

.2 Turn 600 mm of polyethylene up the sides of the decontamination facility and overlap with the polyethylene sheeting covering the walls.

.3 Install plywood with taped and caulked joints between layers of 6 mil polyethylene where required to protect surfaces from water damage (e.g. carpet).

.2 Install walls as follows:

.1 Around all rooms, between all rooms, at entrance to Asbestos Work Area and at entrance to Occupied Area.

.2 Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates.

.3 Install one layer rip-proof polyethylene sheeting on interior walls of Decontamination Facility.

.4 Install one layer rip-proof polyethylene sheeting both sides on interior dividing walls of Decontamination Facility.

.5 Install one layer rip-proof polyethylene sheeting over one layer of 6 mil polyethylene sheeting on walls exposed to the Asbestos Work Area.

.6 For perimeter walls exposed to the Asbestos Work Area, install 13 mm plywood or OSB caulked and sealed at joints, beneath one layer of 6 mil and one layer of rip-proof polyethylene sheeting, on Asbestos Work Area side of framing.

.7 Install one layer rip-proof polyethylene sheeting over one layer of 6 mil polyethylene sheeting on walls exposed to the Occupied Area.

.8 For perimeter walls exposed to the Occupied Area, install 13 mm plywood or OSB caulked and sealed at joints, over polyethylene sheeting, on Occupied Area side of framing. Paint with 2 coats white latex.

.3 Install roof as follows:

.1 Install joists. Size of joists is to be determined by clear span. Consult Ontario building Code (Table A-1). For clear spans up to 2850 mm use SPF Select 38 x 140 mm wood joist at 400 mm o/c with continuous 38 x 140 mm wood headers, and install strapping beneath joists.

.2 At the Contaminated Change Room and where roof is exposed to the Asbestos Work Area, install 19 mm plywood or OSB over joists. Caulk and tape joints and install one layer rip-proof polyethylene sheeting over 2 layers of 6 mil polyethylene sheeting.

.3 Where roof is not exposed to the Asbestos Work Area, install one layer rip-proof polyethylene sheeting over joists.

.4 Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls.

.5 At underside of joists in all rooms, install one layer of polyethylene sheeting.

.6 Minimum interior clear height 2000 mm to underside of joist.

.10 Curtained Doorways

.1 Construct as follows:

.1 Install two flap doors, full width and height of door opening at all doors between chambers, facilities and Asbestos Work Area.

.2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head and alternate jambs.

.3 Install weights attached to bottom edge of each door flap.

.4 Provide direction arrows on flaps to indicate opening.

2.3 Signage

.1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area and on hoarding walls as follows:

.1 CAUTION.

.2 Asbestos Dust Hazard Area.

.3 Unauthorized Entry Prohibited.

.4 Wear Assigned Protective Equipment.

.5 Breathing Asbestos Dust May Cause Serious Bodily Harm.

.2 Vehicles, Bins and Asbestos Waste Containers: Post signs on both sides of every vehicle used for the transportation of asbestos waste and on every asbestos waste container. Signs must display thereon in large, easily legible letters that contrast in colour with the background the word “CAUTION” in letters not less than ten centimetres in height and the words:

.1 CONTAINS ASBESTOS FIBRES

.2 Avoid Creating Dust and Spillage

.3 Asbestos May be Harmful to Your Health

.4 Wear Approved Protective Equipment.

.3 Place placards in accordance with Transportation of Dangerous Goods Act.

PART 3 EXECUTION

3.1 Clean Site Preparation

.1 Remove stored or non-fixed items from the Asbestos Work Area, including but not limited to equipment, furniture, waste etc. Store in area provided by Owner.

.2 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.

.3 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 Procedures as required by O. Reg. 278/05.

.4 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 to clearly mark exit route. Seal emergency exit doors so as not to impede use of door during emergency evacuation.

.5 Install Worker Decontamination facility.

.6 Install signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

.7 Post Ministry of Labour Notice of Project.

.8 Seal openings (excepting electrical trenches) in floor using tape, caulking, polyethylene, etc. Openings in floor are to be sealed independently prior to installation of polyethylene sheeting on floor. Include floors of duct and service shafts.

.1 Large openings in floor to be covered. Construction to comply with loading requirements of Ontario building Code and secured in place. Surround with guard rails as per the Occupational Health and Safety Act. Install one layer of rip proof polyethylene over two layers of 6 mil polyethylene over cover. Mark as opening to below. No personnel are to walk or stand on covered opening unless constructed to support live and dead load.

.9 Seal openings in walls below ceiling level using polyethylene, tape, caulking, etc. including but not limited to windows, doors, vents, diffusers, etc.

.10 Seal openings in ceiling, using polyethylene, tape, caulking, etc. including diffusers, grills, etc.

.11 Establish negative pressure in Asbestos Work Areas as follows:

.1 Install HEPA Filtered Negative Pressure Machines sufficient to maintain pressure differential of -0.02 inches of water between contaminated Asbestos Work Area and Occupied Areas.

.2 Operate HEPA Filtered Negative Pressure Machines continuously from first disturbance of ACM until completion of dismantling.

.3 Replace prefilters frequently to maintain specified flow rate.

.4 Replace HEPA filters as required to maintain flow rate and integrity of unit.

.5 Discharge HEPA filtered negative pressure machines as follows:

.1 To building exterior.

.1 Remove existing glazing where necessary and replace with a 19 mm plywood panel.

.2 Install panel securely on the exterior side of the window frame and make weather-tight with caulking.

.3 For each negative pressure unit, provide a 300 mm diameter, duct opening through panel.

.4 Cover duct opening with chicken wire.

.5 Direct discharge away from building access points.

.6 Reinstall glazing to match existing upon completion of work.

.2 Use polyethylene discharge ducting or metal reinforced polyethylene discharge ducting in locations where the ducting must be protected from damage or collapse.

.3 Install and make airtight all negative air discharge ducting.

.4 Discharge ducting is not to be longer than required, and to be straight, so that the length of the ducting does not reduce the flow from negative pressure machines.

.6 DOP test all HEPA Filtered Negative Pressure Machines where they discharge into Occupied Areas.

.12 Provide one Ground Fault Panel for each 5,000 square feet (500 square metres) of Asbestos Work Area.

.1 Ground Fault Interrupter Panel to use CSA approved equipment and be inspected by the Electrical Safety Authority.

.2 Ensure safe installation by licensed electricians.

.3 Connect to building power at electrical panel outside Asbestos Work Area.

.4 Cable to be completely jacketed with no defects. Tag/mark cable as Live.

.5 All electrical equipment used during work shall be supplied power from a Ground Fault Panel.

.13 Install temporary lighting in all work areas at levels that will provide for a safe and efficient use of the work area.

.14 Isolate, at panel, and disconnect existing power supply to Asbestos Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.

.1 Lock-out/tag-out power at electrical panels.

.2 Mark/tag any items within or passing through the Asbestos Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.

.15 Install hose bib on domestic cold water pipe for connection of hoses for wetting.

.1 Install hoses with watertight connections and airless sprayers to wet asbestos-containing materials.

.16 Shut down HVAC systems serving the Asbestos Work Area.

.1 Leave induction units at building exterior walls on lowest supply setting when temperatures are below 0°C so windows and exterior walls do not ice.

.2 Disable any exhaust/return systems at induction units, washrooms, etc.

.3 Seal and protect induction units with one layer of 6 mil polyethylene sheeting.

.17 Perform clean demolition of non-asbestos materials as specified.

.18 Install one layer of rip-proof polyethylene sheeting on porous materials that cannot be cleaned in Asbestos Work Area.

.19 On walls within and forming the perimeter of the Asbestos Work Area install one layer of 6 mil polyethylene sheeting.

.20 Notify Asbestos Abatement Consultant at least 24 hours prior to the need for Milestone Inspection A (Clean Site Preparation). Obtain written approval for this Milestone Inspection before proceeding.

3.2 Maintenance Of Contaminated Asbestos Work Area

.1 Inspect Asbestos Work Area perimeter Hoarding Walls and Upper Perimeter Seals at the beginning and end of each working period and once on each day work does not take place. Inspection must be performed by competent person.

.2 Inspect HEPA filtered negative pressure machines including discharge ducting at the beginning and end of each working period. Inspection must be performed by competent person.

.3 Perform Differential Pressure Monitoring on a frequent basis and record pressure at start and end of shift at a minimum.

.4 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.

.5 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Asbestos Work Area.

.6 Maintain Asbestos Work Area in tidy condition.

.7 Remove waste and debris frequently.

.8 Remove standing water on polyethylene/floor at the end of every shift.

.9 Turn off water supply to hoses and reduce pressure in hose, prior to leaving the Asbestos Work Area at end of shift.

.10 Turn off water supply to showers, at the end of every shift.

.11 Ensure shower pans are pumped out at the end of every use and shift.

3.3 Wet Removal

.1 Do not use compressed air to clean or remove dust or debris.

.2 Remove and dispose of remaining non-asbestos items before, during or after wet removal.

.3 Spray asbestos-containing pipe insulations with Amended Water using airless spray equipment.

.4 Remove pipe insulations specified to be removed and clean substrate. Maintain exposed surfaces of insulation or lagging in a wet condition.

.1 Full saturation of insulation will not be required if material is immediately bagged and not allowed to fall to floor.

.2 ACM cannot be allowed to fall from one level to the next.

.5 Remove obstructions as required to remove the ACM.

.1 Do not demolish any existing walls etc. that form the perimeter of the Asbestos Work Area without prior written permission from Asbestos Abatement Consultant.

.6 All dislodged ACM shall be maintained in wet state until placed in asbestos waste containers for disposal.

.7 As work progresses, and at regular intervals, place waste in asbestos waste containers and remove from the Asbestos Work Area.

.8 After completion of gross asbestos removal work, perform the following:

.1 Wet clean surfaces from which ACM has been removed with stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue and asbestos-containing materials.

.2 Wet clean surfaces which ACM has fallen on using stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue and asbestos-containing materials

.3 Wet clean other surfaces in the Asbestos Work Area, including the decontamination facilities, scaffolding, equipment, polyethylene sheeting on floor and walls surfaces etc., ducts and similar items not covered with polyethylene sheeting.

.4 Remove wash water as contaminated waste.

.5 Remove waste.

.6 Level of cleanliness must be acceptable to Asbestos Abatement Consultant.

.7 Remove and dispose of the pre-filters from all negative air units as asbestos-contaminated waste.

.9 Notify Asbestos Abatement Consultant at least 24 hours prior to the need for Milestone Inspection D (Visual Clearance). Obtain written approval for this Milestone Inspection before proceeding.

3.4 Waste and Material Handling

.1 Waste bins must be placed on grade or in receiving.

.2 All bins must be covered and locked when waste transfer is not being performed.

.3 Ensure redundant non-ACM, rubble, debris, etc. which was not cleaned and which was removed during contaminated work are treated, packaged, transported and disposed of as asbestos waste.

.4 Fluorescent lamps contain mercury and are to be recycled. Do not dispose of fluorescent lamps.

.5 Clean, wash and apply Post Removal Sealant to metal waste prior to removal from Asbestos Work Area.

.1 Recycle metals or dispose of metals as clean waste.

.6 Clean, wash and apply Post Removal Sealant to non-porous materials prior to disposal as clean waste.

.1 Obtain prior written approval from the Asbestos Abatement Consultant for each individual type of material.

.7 Clean and wash equipment prior to removal from Asbestos Work Area if removed prior to completion.

.8 Place all equipment, tools and unused materials that cannot be cleaned in Asbestos Waste Containers.

.9 As work progresses, and at regular intervals, transport the sealed and labelled asbestos waste containers from the Asbestos Work Area to waste bin.

.10 Place items in bins according to waste classification. Place asbestos waste, metals, non-asbestos waste, etc. in separate bins.

.11 Removal of waste containers and decontaminated equipment and materials from the Asbestos Work Area shall be performed using the Waste and Equipment Decontamination Facility as follows:

.1 Prior to entering the Waste and Equipment Decontamination Facility Container Cleaning Room, the first worker (fully protected inside the Asbestos Work Area) shall remove any visible contamination from the surface of the item or waste container being removed from the Asbestos Work Area.

.2 The first worker then carries the item into the Container Cleaning Room and wet sponges the item prior to passing the item through the curtained doorway to a second worker in the Holding Room. (The second worker shall be fully protected with respirator and disposable clothing and may only leave the decontamination facility via the Asbestos Work Area.)

.3 The second worker in the Holding Room double bags or wraps and seals the item. Without entering the Transfer Room, the second worker passes the item through the curtained doorway into the Transfer Room.

.4 A third worker enters the Transfer Room from the clean area. (The third worker must never enter the Holding Room.) The third worker removes the item from the Transfer Room and transports it to the disposal bin.

.12 Dispose of plaster debris, lath, hangers and other asbestos-contaminated waste that could tear a 6 mil (0.15 mm) polyethylene bag in sealed rigid Asbestos Waste Container.

.13 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.

.14 Limit transportation of waste and materials through Occupied Areas of the building to Quiet Hours.

.15 Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled ACM in the case of a rupture of an Asbestos Waste Container.

.16 Bin loading area and waste routes shall be kept clean at all times. Use Type 2 asbestos abatement procedures if appropriate or requested by Owner's Representative.

.17 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owners operations.

.18 Transport asbestos-contaminated waste to landfill licensed by Ontario Ministry of the Environment.

.19 Co-operate with Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

3.5 Application Of Post Removal Sealant

.1 Wet Removal

.1 Obtain Asbestos Abatement Consultant's written permission to proceed.

.2 Apply one coat of Post Removal Sealant with an airless sprayer, in accordance with Manufacturer's Instructions, to cover all surfaces on all items in the Asbestos Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition.

.3 Notify Asbestos Abatement Consultant at least 24 hours prior to the need for Milestone Inspection E (Air Monitoring Clearance). Obtain written approval of this Milestone Inspection before proceeding.

3.6 Asbestos Work Area Dismantling

.1 Use Type 2 worker precautions during dismantling.

.2 Operate negative air units during dismantling.

.3 Polyethylene, tape, cleaning material, etc. to be treated as asbestos waste.

.4 Wash remaining equipment and tools used in contaminated Asbestos Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Asbestos Work Area.

.5 Clean Asbestos Work Area, Equipment and Access area, washing/Showering Room.

.6 Remove upper seals, and seals over tops of walls, on deck, at columns, etc. within the Asbestos Work Area.

.7 Remove polyethylene sheeting and dispose of as asbestos waste.

.8 Remove water hoses and shut off at source.

.9 Remove Signs, Hoarding Walls, Decontamination Facilities, Equipment Enclosures, Tunnels, Platforms.

.10 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.

.11 Remove temporary lights.

.12 Remove negative air unit prefilters. Dispose of as asbestos contaminated waste.

.13 Remove HEPA filtered negative pressure machines and discharge ducting.

.14 Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.

END OF SECTION

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EnvironmentCan,ExeterRadarStn,HAZ,DSS\Deliverables\Specs\229221.004 Section 02 82 12 High Risk Asbestos Abatement Exeter Radar February 7 2019.docx

PART 1 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 Division 1 and the General Conditions of the Contract.

.2 Related Work Specified Elsewhere

Division 13,	Section 02 82 10	Asbestos Abatement – Low Risk/Type 1
Division 13,	Section 02 82 11	Asbestos Abatement – Moderate Risk/Type 2
Division 13,	Section 02 82 12	Asbestos Abatement – High Risk/Type 3
Division 13,	Section 02 84 10	Mercury Lamps and PCB Ballasts

.3 The site conditions identify the location and condition of all known friable asbestos-containing materials (ACM) to be disturbed by the work of this section.

.4 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 ACM included in work of this section and all materials which have been contaminated by ACM either during or prior to work of this section.

1.2 Site Conditions

.1 Refer to the Hazardous Building Materials Assessment Report, prepared by Pinchin Ltd., dated January 31, 2019 for details on hazardous building materials present in the Work Area.

1.3 Outline of Work

.1 Coordinate the following items with the Construction Manager and Environment and Climate Change Canada (ECCC), which are to be included in the lump sum bid of the Abatement Contractor, including but not limited to: electrical isolations, GFI connection, water connections, hoarding walls, bin placement, hours of work, schedule, etc.

.2 Contractor to verify actual site conditions during the site visit walkthrough, prior to tender, and base tender price on conditions and quantities found. Coordinate all phasing of work with ECCC or the Construction Manager. No extras for variations in quantities or phasing of work/work areas will be accepted.

.3 Remove the following to access asbestos-containing materials:

.1 Penthouse to be accessed through exterior cladding following Moderate Risk/Type 2 procedures of Section 02 82 11.

.4 If for reasons of pipe geometry or access, Glove Bag procedures cannot be used, remove and dispose of asbestos-containing insulations as per Section 02 82 11 (Asbestos Abatement – Moderate Risk/Type 2) or Section 02 82 12 (Asbestos Abatement – High Risk/Type 3) if the removal exceed 1 meter squared of friable material.

.5 Follow the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014) during disturbance of all paint. Special precautions are not required unless aggressive disturbance (grinding, blasting, torching, and welding) is planned of paints in the renovation areas that contain

low levels of lead (i.e., less than the Surface Coating Materials Regulatory cut-off of 0.009% for lead-containing paints). Complete the following:

.1 Remove paint where cutting of steel will occur.

.2 Remove paint where it may be disturbed by the work or follow lead procedures as outlined in the EACO guideline.

.6 Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica should be completed only with proper respiratory protection and other worker safety precautions that comply with provincial standards or guidelines.

.1 Silica work is to be completed in accordance with the Ontario Ministry of Labour Guideline: Silica on Construction Projects, September 2004 (revised 2011).

1.4 Schedule

.1 Coordinate all work, scheduling and phasing with the Construction Manager and ECCC.

1.5 Definitions

.1 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.

.2 Asbestos Abatement Consultant: Owner's Representative providing inspection and air monitoring.

.3 Asbestos Abatement Contractor: Contractor or sub-contractor performing work of this section.

.4 Asbestos-Containing Material(s) (ACM): Material(s) identified under Site Conditions including debris, fallen material and settled dust.

.5 Asbestos Work Area: Area where work takes place which will, or may, disturb ACM.

.6 Authorized Visitors: Prime Contractor, Building Owner or Representatives, Asbestos Abatement Consultant, and persons representing regulatory agencies.

.7 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with Regulation 278/05 and the Occupational Health and Safety Act, and has knowledge of the potential or actual danger to health and safety in the work.

.8 DOP Testing (or HEPA Integrity Test): Testing performed on HEPA Filtered Negative Pressure Machines and HEPA vacuums using DOP or equivalent. Testing shall ensure that total penetration from the unit does not exceed 0.03%, or 99.97% efficient of airborne particulate removal. DOP Testing must be in compliance with ASME N510-1989 (1995) and must be performed using a Temporary Mixing Chamber with installed baffles to allow uniform mixing of challenge aerosol.

.9 Friable Material: means a material when dry can be crumbled, pulverized or powdered by hand pressure or is crumbled, pulverized or powdered.

.10 Fitting: Section of pipe other than straight uninterrupted sections including elbows, valves, tees, hangers, nipples, union or ends.

.11 Glove Bag: The glove bag shall be equipped with,

.1 sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period,

.2 valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure,

.3 a tool pouch with a drain,

.4 a seamless bottom and a means of sealing off the lower portion of the bag, and

.5 a high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.

.12 HEPA Filter: High Efficiency Particulate Arresting filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.

.13 PCM: Phase Contrast Microscopy.

.14 Polyethylene: Either polyethylene sheeting or rip-proof polyethylene sheeting (as specified) with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect underlying surfaces from damage, and to prevent escape of asbestos fibres through sheeting into Occupied Areas.

.15 Personnel: All contractor's employees, sub-contractor's employees, supervisors.

.16 Occupied Area: Any area of the building outside the Asbestos Work Area.

.17 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g. remove and turn over to Owner).

1.6 Submittals

.1 Submit prior to starting work:

.1 Schedule.

.2 Workplace Safety and Insurance Board Clearance Certificate.

.3 Insurance certificates.

.4 Copy of Company Health and Safety Policy and applicable programs.

.5 Ministry of Labour Notice of Project form if more than 1 square metre of insulation will be removed during the work of this section.

.6 Copy of Certificate of Approval for disposal of asbestos waste and location of landfill.

.7 Pre-removal survey of damage in all areas where asbestos abatement will take place or waste will be transported.

.2 Submit the following information regarding personnel prior to starting work:

.1 Resumes of the supervisory personnel.

.2 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal (2 day minimum duration) or are certified as

supervisors under the Ministry of Training, Colleges and Universities course 253S.

.3 WHMIS training certificates for all personnel.

.4 Written statement that personnel have had instruction on hazards of asbestos exposure, the use of respirator, protective clothing, worker and waste decontamination procedures, use of Glove Bags and all aspects of work procedures and protective measures.

.5 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.

.3 Prior to construction of enclosure or asbestos abatement, submit the following information regarding HEPA filtered devices:

.1 Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old.

.2 DOP tests to be performed by an independent testing company.

.1 DOP testing company is required to submit a detailed technical report of testing protocol, including Introduction, Methodology, Results, Conclusions, and Recommendations, including results of the Air-Aerosol Mixing Uniformity test as per ASME N510-1989 (1995).

.2 DOP testing company must also provide calibration certificates from an independent calibration firm or from the manufacturer of the testing equipment for both the aerosol photometer and the pressure gauge on the aerosol generator dated within 1 calendar year from the on-site testing date.

.3 DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing.

.4 Submit the following prior to isolating the work area:

.1 Material Safety Data Sheets for chemicals or material used in the course of the Asbestos Abatement Project.

.2 Glove Bag manufacturer’s product information.

.5 Submit the following upon completion of the work.

.1 Manifests, waybills, bills of ladings etc. as applicable for each type of waste.

1.7 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. Regulations include but are not limited to the following:

.2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.

.3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.

.4 Ministry of Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

1.8 Supervision

.1 Provide onsite, a supervisor, with authority to oversee all aspects of the work, including but not limited to, health and safety, methods, scheduling, labour and equipment requirements.

.2 The supervisor must be on site at all times during work at risk of disturbing ACM. Failure to comply with this requirement may result in a stoppage of work, at no cost to ECCC.

.3 Provide a minimum of one supervisor for every 10 workers.

.4 Replace supervisory personnel, with approved replacements, within 3 working days of a written request from the Asbestos Abatement Consultant. Asbestos Abatement Consultant reserves the right to request replacement of supervisory personnel without explanation.

.5 Do not replace supervisory personnel without written approval from the Asbestos Abatement Consultant.

1.9 Quality Assurance

.1 Ensure the removal and handling of ACM or asbestos contaminated materials is performed by persons experienced in the methods, procedures and industry practices of asbestos abatement.

.2 Complete work so that at no time airborne asbestos, visible solid residue, or water runoff contaminates areas outside Asbestos Work Area. Asbestos Abatement Consultant is empowered to order a shutdown of work when a leak has occurred or is likely to occur. Cost of additional work by Asbestos Abatement Contractor and/or Asbestos Abatement Consultant to rectify unsatisfactory conditions shall be charged to the Asbestos Abatement Contractor.

.3 Perform all work involving other trades such as electrical, mechanical, carpentry, glazing etc. using licensed persons experienced and qualified for the work required.

.4 The Asbestos Abatement Consultant 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 Asbestos Abatement Consultant will not be responsible for or have control or charge over the acts or omissions of the Asbestos Abatement Contractor, his Subcontractors or their agents, employees or other persons performing any of the Work.

1.10 Notification

.1 If more than 1 square metre of insulation is removed during work of this section, before commencing work, notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site.

.2 Notify Sanitary Landfill site as per Ontario Regulation 347 as amended.

.3 Inform all sub trades of the presence of ACM identified in the contract documents.

.4 Notify ECCC or Owner's Representative, the Joint Occupational Health and Safety Committee and the Ontario Ministry of Labour, as required by Regulation 278/05, if friable materials not identified in the contract documents are discovered during the course of the work. Stop work in these areas immediately.

1.11 Insurance

.1 Maintain a Commercial General Liability Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Commercial General Liability insurance shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period.

.2 Maintain an Automobile or Fleet Policy, and Non-owned Automobile Policy with an insurance company acceptable to Pinchin Environmental Ltd. and ECCC. The intent of these policies is to hold Pinchin Environmental Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract.

.3 Maintain a Pollution Liability Policy (or asbestos liability policy or specific coverage under the CGL for asbestos abatement) with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Pollution Liability shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period. Without limiting the generality of the foregoing, the policy shall insure the operations of asbestos abatement and shall not contain any environmental and/or health hazard exclusions relating to remediation operations including asbestos abatement.

.4 Forward all certificates to Pinchin Ltd. and ECCC before work is commenced, showing Pinchin Environmental Ltd and ECCC. as additional insured as their interest may appear.

.5 ECCC may request a certified true copy of the policies.

.6 The limits will not be less than:

.1	Commercial General Liability	$5,000,000.00
.2	Automobile	$2,000,000.00
.3	Pollution Policy (Asbestos Liability)	$5,000,000.00

1.12 Instruction and Training

.1 Provide instruction and training to all workers including the following:

.1 Hazards of asbestos.

.2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that would be used and worn during abatement work, including:

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

.3 Personal hygiene to be observed when performing the work.

.4 The measures and procedures prescribed by this section including use of specific glove bag and decontamination of the worker.

.5 Instruction and training must be provided by a competent person.

1.13 Personal Protection

.1 Protect all personnel at all times when possibility of disturbance of ACM exists.

.2 Provide workers, at a minimum, with non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.

.3 Respirators shall be:

.1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.

.2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.

.3 Assigned to a worker for their exclusive use.

.4 Maintained in accordance with manufacturer's specifications.

.5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.

.6 Repaired or have damaged or deteriorated parts replaced.

.7 Stored in a clean and sanitary location.

.8 Provided with new filters as necessary, according to manufacturer's instructions.

.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.

.9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

.4 Provide protective clothing, to all personnel which:

.1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.

.2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.

.3 Is replaced or repaired if torn or ripped.

.4 Is disposed of as ACM.

.5 Decontaminate protective clothing by using a HEPA Vacuum, or by damp wiping prior to leaving the Asbestos Work Area.

.6 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

.7 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Asbestos Work Area.

.1 Ensure workers wash hands and face when leaving Asbestos Work Area.

.8 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

1.14 Authorized Visitor Protection

.1 Provide clean protective clothing and equipment, and approved respirators to Authorized Visitors.

.2 Ensure Authorized Visitors have received required training prior to granting entry into Asbestos Work Area.

1.15 Air Monitoring

.1 Air monitoring will be performed following the National Institute for Occupational Safety and Health method 7400, Asbestos and other fibres by PCM (Phase Contrast Microscopy).

.2 Co-operate with the Asbestos Abatement Consultant in collection of air samples, including providing workers to wear sampling pumps for up to full-shift periods. Asbestos Abatement Contractor to exercise care with Asbestos Abatement Consultant's equipment. ECCC reserves the right to back-charge the Asbestos Abatement Contractor for further collection of samples damaged by tampering or abuse. In addition, the Asbestos Abatement Contractor will be responsible for the cost of testing equipment repairs resulting from the actions of the Asbestos Abatement Contractor's forces.

.3 Results of air monitoring of 0.05 fibres per millilitre of air (fibre/mL) or greater, outside of Asbestos Work Area, will indicate asbestos contamination of these areas and result in the following actions:

.1 Suspend Work within the adjoining Asbestos Work Area until written authorization to resume Work has been received from the Asbestos Abatement Consultant.

.2 Isolate and clean area in the same manner applicable to the Asbestos Work Area.

.3 Maintain Work area isolation, and repeat clean-up operations until visual inspection and air monitoring results are at a level equal to that specified.

.4 Cost of additional inspection and sampling performed as a result of elevated fibre levels may be charged to the Asbestos Abatement Contractor at ECCC’s discretion.

1.16 Inspection

.1 From commencement of work until completion of clean-up operations, the Asbestos Abatement Consultant may be present periodically on site both inside and outside the Asbestos Work Area. The following Milestone Inspection may take place at the Owner’s cost:

.1 Milestone Inspection D - Visual Clearance

.1 Inspection of Asbestos Work Area after removal of all asbestos.

.2 Do not proceed with next phase of Work until written approval of each milestone is received from the Asbestos Abatement Consultant.

.3 In addition to the Milestone Inspections, inspection of the Asbestos Work Area may be performed to confirm the Asbestos Abatement Contractor's compliance with the requirements of the contract documents and governing authorities. Any deviations from these requirements that have not been approved in writing, may result in a stoppage of work, at no additional cost to the Owner.

.4 The Asbestos Abatement Consultant is empowered by the Owner to inspect for final cleanliness at completion. Additional labour or materials expended by the Asbestos Abatement Contractor to provide satisfactory performance to the level specified shall be at no additional cost.

.5 Inspection and air monitoring performed as a result of Asbestos Abatement Contractor's failure to perform satisfactorily regarding quality, safety, or schedule may be charged to the Asbestos Abatement Contractor at the Owner's discretion.

PART 2 PRODUCTS

2.1 Materials and Equipment

.1 All materials and equipment brought to work site must be in good condition and free of asbestos, asbestos debris, and fibrous materials.

.2 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.

.3 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:

.1 A sealed glove bag, inside a second 6 mil (0.15 mm) sealed polyethylene bag.

.2 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.

.4 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.

.5 Knife: Knife with fully retractable blade for use inside Glove Bag.

.6 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.

.7 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.

.8 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.

.9 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.

.10 Securing Straps: For some types of Glove Bag, reusable nylon straps at least 1" wide with metal tightening buckle for sealing ends of bags around pipe and/or insulation.

.11 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.

.12 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

.13 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

2.2 Signage

.1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area and on barriers and caution tape as follows:

.1 CAUTION.

.2 Asbestos Dust Hazard Area.

.3 Unauthorized Entry Prohibited.

.4 Wear Assigned Protective Equipment.

.5 Breathing Asbestos Dust May Cause Serious Bodily Harm.

.2 Vehicles, Bins and Asbestos Waste Containers: Post signs on both sides of every vehicle used for the transportation of asbestos waste and on every asbestos waste container. Signs must display thereon in large, easily legible letters that contrast in colour with the background the word “CAUTION” in letters not less than ten centimetres in height and the words:

.1 CONTAINS ASBESTOS FIBRES

.2 Avoid Creating Dust and Spillage

.3 Asbestos May be Harmful to Your Health

.4 Wear Approved Protective Equipment.

.3 Place placards in accordance with Transportation of Dangerous Goods Act.

PART 3 EXECUTION

3.1 Site Preparation

.1 Remove to the extent necessary to access piping, stored or non-fixed items from the Asbestos Work Area including but not limited to equipment, furniture, waste etc. Store in area provided by Owner.

.2 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.

.3 Post Notice of Project.

.4 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 Procedures as required by O. Reg. 278/05.

.5 Shut down HVAC systems serving the Asbestos Work Area.

.1 Install polyethylene sheeting over openings in ducts and at diffusers and seal.

.2 HVAC to remaining areas of building must not be disrupted during work of this section.

.3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.

.4 Perform work at scheduled times after shutting down HVAC systems affecting the Asbestos Work Area.

.6 Provide Amended Water for wetting ACM, in garden sprayers. Provide one garden sprayer for each worker.

.7 Provide power from ground fault interrupt circuits as follows:

.1 Use CSA approved ground fault interrupt outlets outside the Asbestos Work Area to provide power to equipment within the asbestos work area.

.2 Provide one specified ground fault electrical panel for each 500 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.

.1 Ground Fault Interrupter Panel to use CSA approved equipment and be inspected by the Electrical Safety Authority.

.2 Ensure safe installation by licensed electricians.

.3 Connect to building power at electrical panel outside Asbestos Work Area.

.4 Cable to be completely jacketed with no defects. Tag/mark cable as Live.

.3 All electrical equipment used during work shall be supplied power from Ground Fault outlets.

.8 Do not used compressed air to clean or remove and dust or debris when completing work of this section.

.9 Cover walls, floors, finishes, millwork, equipment and furnishings below the pipe to be worked on in the Asbestos Work Area with polyethylene drop sheets before disturbing ACM. Drop sheets shall extend a minimum of 6 ‘ from pipe.

.10 Install barricades, fencing, walls or other suitable means, around Asbestos Work Area where existing walls are not present to isolate Asbestos Work Area from the workplace.

.11 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

.12 Use existing lighting or install temporary lighting to a level that will provide for safe and efficient use of work area - minimum 550 LUX.

.13 Place HEPA Vacuum in Asbestos Work Area for each worker.

.14 Place required tools to complete the abatement within the Asbestos Work Area.

3.2 Maintenance of Asbestos Work Area

.1 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Asbestos Work Area.

.2 Maintain Asbestos Work Area in tidy condition.

3.3 Glove Bag Removal

.1 Do not use Glove Bags on hot pipes that may damage Glove Bag. Refer to manufacturers limitations.

.2 Prior to use of Glove Bag on damaged or unjacketed insulation:

.1 Spray any areas of damaged insulation jacketing with mist of Amended Water.

.2 Tape over damaged insulation to provide temporary repair.

.3 Mist areas of insulation with no jacketing and wrap with polyethylene sheeting and seal with tape.

.3 Place any tools necessary to remove insulation in tool pouch built into Glove Bag.

.4 Inspect the Glove Bag for damage and defects:

.1 Immediately before it is attached to the pipe or, duct. or other.

.2 At regular intervals during its use.

.3 If damage or defects are observed prior to use of the Glove Bag, dispose of Glove Bag.

.4 If damage or defects are observed during the use of the Glove Bag, which cannot be readily repaired with tape and not affect the integrity or strength of the glove bag.

.1 Discontinue use of Glove Bag.

.2 Wash inner surface of Glove Bag.

.3 Wet insulation.

.4 Insert nozzle of HEPA Vacuum into bag through valve and evacuate air from bag.

.5 Seal valve cover on valve Glove Bags.

.6 Pull an Asbestos Waste Container over Glove Bag before removing from pipe. Remove securing straps. Unfasten zipper.

.7 Remove Glove Bag and seal with tape.

.8 Seal the Asbestos Waste Container with tape.

.9 Place in a second Asbestos Waste Container and seal with tape.

.10 Clean immediate area with a HEPA Vacuum prior to resuming work.

.5 Install Glove Bag as per manufacturer's instructions.

.6 Remove metal jacketing or banding carefully. Do not damage the Glove Bag.

.7 Remove insulation from pipe as per manufacturer's directions.

.1 Volume and weight of insulation must not exceed capacity of the Glove Bag or supports.

.2 Arrange insulation in the Glove Bag to maximize use of the Glove Bag.

.8 Only Glove Bags designed to be moved may be re-used on other sections of pipe or moved down same section of pipe (e.g. Safe-T-Strip).

.9 If bag is to be moved along pipe for use on adjacent section of insulation:

.1 Wash inner surface of Glove Bag.

.2 Wash tools and place tools in pouch.

.3 Wet surface of insulation in lower section of bag and any exposed end of asbestos insulation remaining on pipe with Amended Water.

.4 Insert nozzle of HEPA filtered vacuum cleaner into bag through valve and evacuate air from bag.

.5 Seal closure strip.

.6 Loosen securing straps to maintain a loose seal of Glove Bag to insulation or pipe.

.7 Use double throw zipper as necessary to pass hangers.

.8 Tighten straps once bag is in new position and continue insulation removal until Glove Bag is full, work is completed on the pipe or an obstruction prevents further movement of the bag.

.10 If bag is to be removed from a pipe for use on a new section of pipe, perform the following:

.1 Wash inner surface of Glove Bag.

.2 Wash tools and place tools in pouch.

.3 Wet surface of insulation in lower section of bag and any exposed end of asbestos insulation remaining on pipe with Amended Water.

.4 Insert nozzle of HEPA filtered vacuum cleaner into bag through valve and evacuate air from bag.

.5 Seal valve cover on valve Glove Bags.

.6 Seal closure strip.

.7 Wash top section of Glove Bag and tool pouch thoroughly.

.8 Undo securing straps, unfasten zipper and carefully move bag to new section of pipe.

.11 To remove bag after completion of insulation removal operation:

.1 Wash inner surface of Glove Bag.

.2 Wash and place all tools in one hand (glove), pull hand out inverted, twist to create a separate pouch, tape inverted hand at two separate locations 25 mm apart so as to seal pouch.

.1 Remove inverted hand and tools by cutting between the two tape seals.

.2 Place inverted hand pouch and tools into the next clean Glove Bag to be used or into a water bucket, open pouch underwater and clean tools.

.3 Wet surface of insulation in lower section of bag and any exposed end of asbestos insulation remaining on pipe with Amended Water.

.4 Insert nozzle of HEPA filtered vacuum cleaner into bag through valve and evacuate air from bag.

.5 Seal valve cover on valve Glove Bags.

.6 Seal closure strip if equipped with one.

.7 Pull an Asbestos Waste Container over Glove Bag before removing from pipe. Undo securing straps. Unfasten zipper.

.1 Seal Glove Bag with tape.

.2 Seal Asbestos Waste Container with tape.

.8 Ensure pipe is clean of all residue after removal of Glove Bag. If necessary, after removal of each section of asbestos, vacuum all surfaces of pipe, using HEPA vacuum or wipe with wet cloth.

.12 Seal all surfaces of freshly-exposed pipe with Post Removal Sealer. Cover exposed ends of any remaining asbestos insulation with canvas and lagging using Type 2 Procedures.

3.4 Waste and Material Handling

.1 Waste bins must be placed on grade or in receiving.

.2 All bins must be locked and covered when waste transfer is not being performed.

.3 As work progresses, and at regular intervals, transport the sealed and labelled Asbestos Waste Containers from the Asbestos Work Area to asbestos waste bin.

.4 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner.

.5 Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled ACM in the case of a rupture of an Asbestos Waste Container.

.6 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owner's operations.

.7 Removal of waste containers and decontaminated tools and materials from the Asbestos Work Area shall be performed as follows:

.1 Remove any visible contamination from the surface of the non-porous or sealable item being removed from the Asbestos Work Area. If the item can be cleaned, remove it from the site. If it cannot be cleaned thoroughly, place it in an Asbestos Waste Container.

.2 Place waste or item in Asbestos Waste Container and seal closed.

.3 Wet wipe outside of Asbestos Waste Container.

.4 At entrance to Asbestos Work Area, place in second Asbestos Waste Container. Seal closed.

.5 Remove the item from the Asbestos Work Area.

.8 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

.9 Co-operate with Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

3.5 Clean-Up and Dismantling

.1 Notify Asbestos Abatement Consultant at least 24 hours prior to the need for Milestone Inspection D (Visual Clearance). Obtain written approval for this Milestone Inspection before proceeding.

.2 Remove barricades, fencing, caution tape, signs, etc.

.3 Seal openings in HEPA vacuums.

.4 Do not empty HEPA vacuums on site unless a Type 2 Enclosure is constructed.

.5 Remove equipment and tools.

.6 Remove ground fault panels if used.

.7 Remove temporary lighting if used.

.8 Remove polyethylene seals from HVAC systems.

.9 Place polyethylene sheeting, drop sheets, seals, tape, clothing and other contaminated waste in asbestos waste containers, wet wipe and place in second asbestos waste container.

.10 Clean Asbestos Work Area with HEPA vacuums or wet wiping/mopping.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

.1 Perform the following work practices for the handling, packaging, and transfer of materials containing polychlorinated biphenyls (PCB) ballasts and mercury-containing lamps.

.2 Related Work Specified Elsewhere

Division 13,	Section 02 82 10	Asbestos Abatement – Low Risk/Type 1
Division 13,	Section 02 82 11	Asbestos Abatement – Moderate Risk/Type 2
Division 13,	Section 02 82 12	Asbestos Abatement – High Risk/Type 3
Division 13,	Section 02 82 13	Asbestos Abatement - Glove Bag

.3 Unless otherwise shown or specified it is the intent that work performed as per this section will result in the removal and destruction of PCB-containing ballasts and removal and recycling of mercury-containing lamps.

1.2 Site Conditions

.1 Refer to the Hazardous Building Materials Assessment Report, prepared by Pinchin Ltd., dated January 31, 2019 for details on hazardous building materials present in the Work Area.

1.3 Outline of Work

.1 Coordinate the following items with the Construction Manager and Environment and Climate Change Canada (ECCC), which are to be included in the lump sum bid of the Abatement Contractor, including but not limited to: electrical isolations, GFI connection, water connections, hoarding walls, bin placement, hours of work, schedule, etc.

.2 Contractor to verify actual site conditions during the site visit walkthrough, prior to tender, and base tender price on conditions and quantities found. Coordinate all phasing of work with ECCC or the Construction Manager. No extras for variations in quantities or phasing of work/work areas will be accepted.

.3 Throughout the building, remove the following;

.1 Fluorescent lamps and bulbs.

.2 Ballasts.

.4 Identify ballasts as either non-PCB or PCB-containing.

.5 Recycle or dispose of non-PCB ballasts.

.6 Package and recycle mercury-containing lamps and bulbs.

.7 Package PCB-containing ballasts.

.8 Transport packaged mercury waste to a MOE (Ministry of the Environment) approved recycling facility and recycle. Contractor to assume all costs incurred including recycling, transport, permits, approvals and record keeping.

.9 Transport packaged PCB waste to a MOE (Ministry of the Environment) approved incineration facility and destroy. Contractor to assume all costs incurred including destruction, transport, permits, approvals and record keeping.

1.1 Schedule

.1 Coordinate all work, scheduling and phasing with the Construction Manager and ECCC.

1.2 Definitions

.1 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with the Occupational Health and Safety Act and Environmental Protection Act, has knowledge of the potential or actual danger to health and safety in the work.

.2 Mercury Waste: Equipment, materials or items containing mercury or contaminated with mercury.

.3 Polyethylene: Either polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect underlying surfaces from damage.

.4 PCBs: Monochlorinated or Polychlorinated Biphenyls (or any mixture of both).

.5 PCB Material: means material containing PCBs at a concentration of more than fifty milligrams per kilogram or 50 parts per million, whether the material is liquid or not.

.6 PCB Waste: PCB Equipment, PCB Material, PCB Liquids and materials or items contaminated with PCBs.

.7 Personnel: All contractors' employees, sub-contractor's employees, supervisors.

.8 Work Area: Area of building from which PCB or mercury-containing items are being removed.

1.3 Submittals

.1 Prior to starting work, the Contractor performing work of this section shall submit:

.1 Workplace Safety and Insurance Board Clearance Certificate.

.2 Insurance certificates.

.3 Certificate of Approval for transportation of mercury waste and location of recycling facility.

.4 Certificate of Approval for transportation of PCB waste and location of destruction facility.

.5 Material Safety Data Sheets for chemicals or material used in the course of the PCB and Mercury Abatement Project.

.2 Prior to starting work, submit the following information regarding personnel:

.1 WHMIS training certificates for all personnel.

.3 Submit the following upon completion of the work.

.1 Manifests, bills of lading, certificate of destruction/recycling etc. as applicable for each type of waste.

1.4 Regulations

.1 Perform work in accordance with current applicable environmental and occupational health regulations and codes including but not limited to:

.1 PCB Regulations, SOR 2008-273

.2 Regulation 347 as amended.

.3 Regulation 490/09 Designated Substances.

.4 Transportation of Dangerous Goods Act.

1.5 Supervision

.1 Provide a supervisor, with authority to oversee aspects of the work, including but not limited to, health and safety, methods, scheduling, labour and equipment requirements.

.2 A minimum of one supervisor for every 10 workers is required.

.3 Replace supervisory personnel, with approved replacements, within 3 working days of a written request.

1.6 Quality Assurance

.1 Ensure the removal and handling of PCBs and mercury is performed by persons experienced in the methods, procedures and industry practices.

.2 Complete work so that at no time do PCBs or mercury contaminate the building or environment.

1.7 Insurance

.1 Maintain a Comprehensive General Liability Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Commercial General Liability insurance shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period, even though a claim may not be presented for many years.

.2 Maintain an Automobile or Fleet Policy, and Non-owned Automobile Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of these policies is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract.

.3 Maintain a Pollution Liability Policy with an insurance company acceptable to Pinchin Ltd. and ECCC. The intent of this policy is to hold Pinchin Ltd. and ECCC harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Pollution Liability shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period, even though a claim may not be presented for many years. Without limiting the generality of the foregoing, the policy shall insure the operations of the work and shall not contain any environmental and/or health hazard exclusions relating to remediation operations.

.4 All certificates must be forwarded to Pinchin Ltd. and ECCC before work is commenced, showing ECCC as additional insured as their interest may appear.

.5 ECCC may request a certified true copy of the policies if he deems it necessary.

.6 The limits will not be less than:

.1	Commercial General Liability	$5,000,000.00
.2	Automobile	$2,000,000.00
.3	Pollution Policy	$5,000,000.00

1.8 Instruction and Training

.1 Instruction and training must be provided to all workers and supervisors. Instruction and training includes the following:

- .1 Hazards of PCBs and mercury.
- .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that would be used and worn during work, including:
  - .1 Limitations of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Proper fitting of equipment.
  - .4 Disinfecting and cleaning of equipment.
- .3 Personal hygiene to be observed when performing the work.
- .4 The measures and procedures prescribed by this section.
- .5 Instruction and training must be provided by a competent, qualified person.

1.9 Personal Protection

.1 During work involving mercury, personnel are to wear the following additional personal protective equipment:

- .1 Protective eyewear.

.2 During work involving PCBs, personnel are to wear the following personal protective equipment:

- .1 Gloves.
- .2 Aprons.

.3 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Work Area.

.4 Prohibit smoking, eating, drinking, chewing in the Work Area.

.5 Use hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

.6 PCB ballasts do not present an inhalation hazard when handled. In the event of a fire or other heating of PCB Equipment, Material, Waste or Liquid, immediately vacate the area. Air purifying filter respirators DO NOT provide protection against PCB vapours.

.7 In the event of PCB ingestion, obtain medical assistance immediately.

.8 Do not break lamps or bulbs.

PART 2 PRODUCTS

2.1 Materials

.1 Apron: Full body neoprene apron.

.2 Containment Drums: new, not used double bung 45 gallon No. 16 gauge cold rolled steel drums with removable steel lid, PCB resistant gasket, and 12 gauge compression type ring closure with 5/8" bolt and forged lug. Drums shall be newly painted inside and out with bright white rust-resistant enamel.

.3 Drum liners: clear polyethylene bag, 36" x 60", 6 mil thick. Open one 36" end.

.4 Gloves: Elbow length, of PCB resistant material (neoprene) and in good condition.

.5 Label: Mercury and PCB warning labels.

.6 Lamp Storage Container: Cardboard box that lamps were originally packaged within, or plastic tote for recycling lamps. Intent is to package lamps so that they are not broken during shipping. Container to be designed for lamps of that size.

.7 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints. New materials only.

PART 3 EXECUTION

3.1 Packaging

.1 Do not contaminate building surfaces with PCB-containing oil, tar, mercury, etc.

.2 Notify Owner's Representative of any spills immediately.

.1 Any spills of PCBs or mercury are to be cleaned to the satisfaction of ECCC's Representative at the contractors cost.

.3 Prior to removing any fixtures, conduit, bx cable etc., isolate, at panel, and disconnect existing power supply to electrical equipment. Power supply to remaining areas of building must not be disrupted during work of this section.

.1 Lock-out/tag-out power at electrical panels.

.2 Mark/tag any items within or passing through the Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc. as required.

.4 Remove bx cable, conduit and wire from lights back to junction box.

.5 Install polyethylene drop sheets in packaging area to protect surfaces and finishes.

.6 Package lamps in lamp storage containers. Do not break lamps.

.1 Affix label.

.7 Place PCB waste including on polyethylene drop sheets immediately after removal.

.8 Avoid rough handling of PCB ballasts. Do not drop or throw into drum.

.9 Place ballasts and capacitors on end in Containment Drum. When full:

.1 Seal liner bag with duct tape.

.2 Seal drum with lid, gasket and compression ring.

.3 Affix specified and completed label.

.4 Do not leave liner bags or drums open overnight.

.10 As filled drums accumulate, transfer to temporary storage area.

.11 Temporary storage facility to be a fully enclosed block wall room within the building complete with appropriate warning signs.

.12 Remove contaminated material, including gloves, aprons, rags, hoses, solvents, protective coveralls, polyethylene, etc. and package as per the above.

3.2 Transportation and Reporting

.1 Transport materials following Transportation of Dangerous Goods Act.

.1 Transport Mercury Materials and Waste to approved site for recycling, including mercury vapour in lamps, and ensure materials are recycled.

.2 Transport PCBs to approved incineration site for destruction and ensure materials are destroyed.

.2 The facility used to process and recycle the mercury shall be approved by the Ministry of the Environment, or local jurisdictional authority, and shall have valid Certificates of Approval to carry out the work outlined herein.

.1 The facility must issue a Certificate of Recycling identifying types and quantities of materials generated from the project. The facility must also provide a Certificate of Recycling for the mercury generated from the project.

.1 Any elemental mercury drained from its container is to be identified by a manifest. All remaining mercury-containing materials must be identified on a bill of lading.

.3 The facility used to process the PCBs shall be approved by the Ministry of the Environment, and shall have valid Certificates of Approval to carry out the work outlined herein.

.1 The facility must issue a Certificate of Destruction identifying types and quantities of PCBs generated from the project.

.4 A typed and signed transfer document for each transfer of PCBs or mercury is to be submitted to Owner's representative, giving following:

.1 Number of drums or boxes.

.2 Contents including approximate quantities.

.3 Approximate net weight of contents.

.4 Dates removal begun and completed (for each lot).

.5 Date drums transferred.

.5 Submit certificate(s) of destruction, certificate of recycling (as applicable) and waste manifests or bills of lading from **all** transfer points. Submit the above for waste **regardless** of single transport or as blended waste.

3.3 Fire and Explosion Response

.1 PCB liquids are relatively non-flammable. However, if exposed to flame or hot surfaces, a higher vapour concentration will result. At high temperatures 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 the local Fire Marshall and Fire Department. Report specifically the presence of PCBs. The necessity to rapidly report the fire overrides any decontamination procedures.

.3 Cause all workers to evacuate the site. When leaving, shut down all water in use. Only personnel trained in use of, and wearing SCBA apparatus, will be allowed to re-enter site.

.4 Do not return to site until Owner's Representative and Ontario Ministry of the Environment representatives have declared the area for re-entry.

3.4 Broken Lamps

.1 If lamps are broken, clean-up using a HEPA vacuum. If significant quantities are broken, repackage waste in containment drums, and empty HEPA vacuum into drum. Wear NIOSH approved ½ face respirators with appropriate filters if repackaging significant quantities of broken lamps.

END OF SECTION

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