PART 1 GENERAL

1.1 Related Work

.1 This section is to be read in conjunction with all other sections so as to comply with the General Conditions of the Contract.

.2 Refer to the following related sections:

.1 Section 02 82 00.02 - Type 2 Asbestos Abatement (Intermediate Precautions)

.2 Section 02 82 00.03 - Type 3 Asbestos Abatement (Maximum Precautions)

.3 Section 02 82 13.13 - Glove Bag Asbestos Abatement Operations (Type 2)

.4 Asbestos Abatement Floor Plan Drawings

1.2 Regulations

.1 Work must comply with the following regulations and guidance documents:

.1 Occupational Health and Safety Act (OHSA), R.S.O. 1990

.2 Environmental Protection Act, R.S.O. 1990

.3 Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05

.4 Designated Substances, Ontario Regulation 490/09

.5 General – Waste Management, Ontario Regulation 347/90, Environmental Protection Act

.6 Hazardous Products Act

.7 Transportation of Dangerous Goods Act

.8 Lead on Construction Projects, Ministry of Labour Guidance Document, under the OHSA

.9 Silica on Construction Projects, Ministry of Labour Guidance Document, under the OHSA

.10 EACC Lead Guideline for Construction, Renovation, Maintenance or Repair

.11 EACC Mould Abatement Guidelines

.12 Alert – Mould in Workplace Buildings, Ontario Ministry of Labour

.2 Work must comply with all applicable federal, provincial, and local requirements. In any case where a conflict arises between or among the regulations, guidance documents or with specifications provided herein, the more stringent requirements shall be followed.

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1.3 Definitions

.1 *Air Samples* - samples collected by drawing a specified volume of air through specified sample filters.

.2 *Amended Water* - water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 *Asbestos* - any of the fibrous silicates listed in O. Reg. 278/05.

.4 *Asbestos-Containing Material (ACM)* – a material that contains 0.5 per cent or more asbestos by dry weight and as identified under Existing Conditions.

.5 *Asbestos Work Area* – the area where asbestos-containing materials have been identified for removal, cleanup or that may be disturbed and to which general access is prohibited.

.6 *Asbestos Waste* – refers to asbestos-containing materials and asbestos-contaminated materials or products that have been removed from the Asbestos Work Area.

.7 *Building* - defined by the Regulation includes a structure, vault, chamber or tunnel and including (without limitation) its electrical, plumbing, heating and air handling equipment, including rigid duct work of a building or structure.

.8 *Competent Worker* - a worker who is qualified because of knowledge, training and experience to do the specific work, who is familiar with the Act and with the provisions of the Regulations that apply to the work, and who knows of all potential or actual danger to health or safety in the work.

.9 *Construction* – defined by the Act as including "erection, alteration, repair, dismantling, demolition, structural maintenance, painting, land clearing, earth moving, grading, excavating, trenching, digging, boring, drilling, blasting, or concreting, the installation of any machinery or plant, and any work or undertaking in connection with a project".

.10 *Consultant* – Owner's representative for work associated with asbestos abatement work.

.11 *Contractor* – Contractor or sub-contractor undertaking the asbestos abatement work and holding the Notice of Project.

.12 *Friable Material* – a material that when dry, can be crumbled, pulverized or powdered by hand pressure, or is crumbled, pulverized or powdered.

.13 *HEPA Filter* - a high efficiency particulate aerosol filter capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.14 *HEPA Integrity Test (or DOP test)* – a method to test HEPA filters installed in vacuums and negative pressure units for leaks. The testing must be completed in conformance with current industry standards of practice.

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.15 *Inspector* – Owner's authorized representative (i.e. Consultant) to ensure work is undertaken in accordance with the Contract requirements.

.16 *Lock-down sealant* – compound used to "lock-down" microscopic residual asbestos fibers present after the removal of asbestos containing materials.

.17 *Negative Air* - a term used to refer to the system of air filtration used for controlling airborne asbestos at asbestos removal projects through the maintenance of lower air pressure on the inside of an enclosure than exists on the outside

.18 *Non-friable Material* - a material that cannot be crumbled, pulverized or powdered by hand pressure.

.19 *Occupied Area* – an area outside of the asbestos abatement Work Area.

.20 *Owner* - defined by the Act as including a "trustee, receiver, mortgagee in possession, tenant, lessee, or occupier of any lands or premises used or to be used as a workplace, and a person who acts for or on behalf of an owner as an agent or delegate".

.21 *PCM* – Phase Contract Microscopy

.22 *Polyethylene* - polyethylene sheeting or rip-proof polyethylene sheeting used to construct that abatement enclosure to isolate Occupied areas of the building from the asbestos Work Area or for the protection of materials.

.23 *Presumed Asbestos-Containing Materials (PACM)*: Materials assumed to contain asbestos based on their composition, age, appearance, location or other available information, but not confirmed through laboratory analysis. Such materials shall be treated as asbestos-containing unless demonstrated otherwise through appropriate sampling and analysis, in accordance with O. Reg. 278/05 and as specified herein.

.24 *Sprayer* - garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray.

.25 *Supervisor* – person in charge of the workplace or authority over a worker.

.26 *Suspect Asbestos-Containing Materials (SACM)*: Materials potentially containing asbestos that were not identified during the assessment but may be uncovered during renovation or demolition. Such materials shall be presumed asbestos-containing unless laboratory analysis confirms otherwise.

.27 *TEM (Transmission Electron Microscopy)* - An analytical method used to identify and quantify asbestos fibres in air or bulk material samples through high-resolution electron microscopy. TEM allows for the detection of very fine asbestos fibres and the identification of asbestos mineral types based on their physical and chemical characteristics.

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.28 *Visitors* – Engineer, Contractor, Consultant or other designated representatives of the Owner and representatives of Regulatory agencies.

1.4 Existing Conditions

.1 Refer to Item 1.4 of Section 02 82 00.03.

1.5 General Requirements

.1 Refer to Item 1.5 of Section 02 82 00.03.

1.6 Description of Work

.1 Refer to Item 1.6 of Section 02 82 00.03.

1.7 Schedule

.1 Refer to Item 1.7 of Section 02 82 00.03.

1.8 Submittals

.1 Refer to Item 1.8 of Section 02 82 00.03.

1.9 Instruction and Training

.1 Refer to Item 1.9 of Section 02 82 00.03.

1.10 Worker Protection

.1 Only persons wearing protective clothing and equipment (i.e. respirators) may enter a Work Area where there is an asbestos dust hazard.

.2 Requirements for the use of protective clothing are as follows:

.1 Be made of a material that does not readily retain or permit penetration of asbestos fibres.

.2 Consist of head covering and full body covering that fits snugly at the ankles, wrists and neck to prevent asbestos fibres from reaching the garments and skin under the protective clothing.

.3 Must include suitable footwear.

.4 Must be repaired or replaced if torn.

.5 Must be decontaminated by damp wiping or HEPA vacuuming before leaving the Work Area

.3 Requirements for the use of respirators are as follows:

.1 Every worker who will enter the Work Area must don a NIOSH approved respirator in accordance with Table 2 of O. Reg. 278/05.

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.2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters must be provided to workers.

.3 NIOSH certified respirators are to be used.

.4 Written procedures must be in place for the selection, care and use of respirators. A copy of the procedures must be given to and reviewed with each worker who is required to wear a respirator.

.5 A worker must not be assigned to do work requiring the use of a respirator unless the worker is physically able to do the work while wearing the respirator.

.6 Respirators must be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is a hood or helmet type.

.7 Respirators must be assigned to a worker for his or her exclusive use, if practical.

.8 Respirators must be used and maintained in accordance with written procedures that are consistent with the manufacturer's specifications.

.9 Replace filters as necessary in accordance with manufacturer’s instructions.

.10 Respirators that are assigned to one worker must be cleaned, disinfected and inspected at least after use on each shift.

.11 Respirators that are used by more than one worker must be cleaned, disinfected and inspected after each use.

.12 Damaged or deteriorated respirator parts must be replaced before the respirator is used by a worker.

.13 Respirators must be stored in a convenient, clean and sanitary location when not in use.

.14 Workers must receive training in the use, cleaning and disposal of respirators and protective clothing.

.15 The respirator training must include the limitations of the equipment, inspection and maintenance, proper fitting and cleaning and disinfection.

.16 All workers donning a respirator must be fit tested for that respirator. Fit testing must be provided by a competent person.

.4 Requirements for other personal protective equipment are as follows:

.1 Hard hats, safety shoes, safety glasses and protective gloves should be won by workers in accordance with construction safety regulations.

.5 Other safety measures to be followed include:

.1 Eating, drinking, chewing or smoking must not be permitted in the Work Area.

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.2 Workers must dispose of protective clothing as contaminated waste before leaving the Asbestos Work Area.

.3 Ensure workers wash hands and face with soap and water when leaving the Asbestos Work Area. Facilities for washing must be located outside the Work Area.

1.11 Visitor Protection

.1 Refer to Item 1.13 of Section 02 82 00.03.

1.12 Supervision

.1 Refer to Item 1.14 of Section 02 82 00.03.

1.13 Notification

.1 Inform all sub-trades of the presence of asbestos-containing materials as identified herein.

.2 Submit to the Owner and Consultant a copy of all notifications prior to the start of work.

.3 Notify disposal site in advance of delivery of asbestos waste in accordance with the requirements of the Waste Management Regulation (O. Reg. 347/90).

.4 Notify the Consultant, Owner and Joint Occupational Health and Safety Committee and the Ministry of Labour if friable materials suspected of containing asbestos that was not previously identified become uncovered as required in O. Reg. 278/05.

1.14 Insurance

.1 Refer to Item 1.16 of Section 02 82 00.03.

1.15 Inspection

.1 Inspections of the Asbestos Work Area may be undertaken by the Consultant:

.1 At any time during abatement and/or cleanup activities with or without prior notice.

.2 Within or around the abatement Work Area.

.2 Milestone inspections may include any or all of the following:

.1 Pre-abatement Inspection – to inspect the setup of containment. Contractor not to proceed with contaminated work until written authorization is provided by the Consultant.

.2 Bulk or Spot Inspection – to inspect active asbestos removal activities.

.3 Final Inspection – to verify the scope of abatement work has been completed in accordance with Contract documents and that the Work Area is visibly clean and free of dust and debris. Contractor not to proceed with the application of the lock-down agent

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until written authorization is provided by the Consultant. If clearance air monitoring is required, it will be undertaken only after the Work Area has passed this final inspection.

.3 Consultant engaged by the Owner to perform inspections and air monitoring is authorized to identify deficiencies in the asbestos work and provide site instructions to ensure compliance with Contract requirements.

.4 Failure to pass the inspections noted above may require the Contractor to expend additional resources to provide satisfactory performance at no additional charge to the Owner. The Consultant is empowered by the Owner to inspect for final cleanliness at completion.

.5 The Contractor will incur the cost of the Consultant's site visit should the Contractor not be ready for a scheduled milestone inspection by the Consultant.

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

.7 Additional inspections or air monitoring that may be required as a result of the Contractor's failure to perform the work satisfactorily may result in back charges to the Contractor at the Owner's discretion.

1.16 Air Monitoring

.1 Air monitoring may be undertaken by the Consultant:

.1 At any time during abatement and/or cleanup activities.

.2 From inside and/or outside of the asbestos abatement Work Area.

.3 On workers engaged in abatement and/or cleaning activities to ensure respiratory safety factors are not exceeded.

.2 Air monitoring will be undertaken following NIOSH Method 7400, ASBESTOS and OTHER FIBERS by PCM (Phase Contrast Microscopy).

.3 If air monitoring results indicate areas outside of the Asbestos Work Area/enclosure (i.e. Occupied space) are in excess of 0.05 fibres per millilitre of air (fibre/mL), the following measures are to be implemented by the Contractor:

.1 Stop work within the Asbestos Work Area.

.2 Notify Owner and Consultant who are to investigate the concern.

.3 Work is not to resume until written authorization is provided by the Consultant.

.4 Isolate and clean the contaminated area following Type 2 cleanup measures (no enclosure).

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.5 Maintain isolation of the impacted area and repeat cleaning efforts until results of visual inspection and subsequent air monitoring are found to be acceptable by the Consultant.

.6 Implement other measures as directed by the Consultant to remedy the situation. These may include the installation of negative air units within the impacted area.

.4 If air monitoring results within the Asbestos Work Area are in excess of the respirator protection factor, the following measures are to be implemented by the Contractor:

.1 Stop work within the Asbestos Work Area.

.2 Workers must exit the Asbestos Work Area via the decontamination facility.

.3 Consultant should be notified and the area not re-entered until measures are taken to resolve the issue – workers are not permitted to re-enter until advised by the Consultant in writing.

.5 Costs associated with additional inspections and air monitoring due to deficiencies in the maintenance of the Asbestos Work Area resulting in elevated asbestos fibre levels inside or outside the Work Area may be charged back to the Contractor at the discretion of the Owner.

PART 2 PRODUCTS

2.1 Materials and Equipment

.1 General Materials

.1 *Amended Water* - water containing a surfactant to reduce water surface tension. Surfactant added at a concentration to provide penetration and wetting of asbestos fibres.

.2 *Lock-Down Sealer* - non-staining, clear, water-dispersible material that is designed for the purpose of trapping residual asbestos fibres. The sealer should remain tacky on surface for at least 8 hours and shall have flame spread and smoke developed rating both less than 50.

.3 *Polyethylene* – minimum 6 mil (0.15 mm) thick unless otherwise specified; in sheet size to minimize joints.

.4 *FR Polyethylene* - minimum 6 mil (0.15 mm) thick, woven fibre reinforced fabric bonded both sides with polyethylene.

.5 *Tape* - fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

.6 *Plastic Bags* - minimum 6 mil (0.15 mm) thick sheet polyethylene. Bag seams shall be sufficiently strong to resist pressure and shocks that occur under normal conditions of transport.

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.7 *Drums* - sturdy non-reusable, steel, aluminum, or plastic, with tight-fitting lids acceptable to the Ontario Ministry of Environment and waste disposal facility.

.8 *Asbestos Waste Containers* - contain waste in two separate containers. The inner container shall be a 6 mil (0.15 mm) thick sealable polyethylene bag. Outer container shall be a sealable metal or fibre type where there are sharp objects included in the waste material; otherwise the outer container may be sealable metal or fibre type or a second 6 mil (0.15 mm) thick sealable polyethylene bag. Containers should be labelled as prescribed in O. Reg. 347/90 and O. Reg. 278/05.

.9 *Duct Tape* - Good quality, water resistant plastic type.

.10 *Protective Clothing* – shall be provided by the employer and worn by every worker who enters the Work Area. The protective clothing,

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

.2 shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing,

.3 shall include suitable footwear, and

.4 shall be repaired or replaced if torn.

.2 Equipment

.1 Vacuums - HEPA filtered wet/dry type with accessories adequate to perform removal and cleanup work or to provide negative pressure in smaller Type 1 Work Areas.

.3 Warning Signage

.1 Provide warning signs to convey the following:

.1 Caution Asbestos Dust Hazard

.2 Work area is restricted to persons wearing protective clothing and equipment

.3 Breathing asbestos dust may cause serious bodily harm

.4 Entry is prohibited except to authorized persons.

.5 Drinking, eating and smoking are prohibited in this area.

.2 Place placards on vehicles transporting asbestos waste in accordance with Transportation of Dangerous Goods Act.

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PART 3 EXECUTION

3.1 Project Requirements

.1 Comply with the following requirements when performing the following Type 1 operations within the Work Area.

.1 Installing or removing ceiling tiles that are asbestos-containing material, if the tiles cover an area less than 7.5 square metres and are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.

.2 Installing or removing non-friable asbestos-containing material, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.

.3 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,

.1 the material is wetted to control the spread of dust or fibres, and

.2 the work is done only by means of non-powered hand-held tools.

.4 Removing less than one square metre of drywall in which joint-filling compounds that are asbestos-containing material have been used.

3.2 HVAC System Isolation

.1 Assess the potential for asbestos fibre migration through mechanical ventilation systems serving the Work Area. Where HVAC operation could result in the spread of asbestos dust or fibres, temporarily shut down and isolate the affected systems or implement other effective measures to prevent contamination of connected systems and adjacent areas. Maintain appropriate dust controls throughout the Work in accordance with O. Reg. 278/05. Maintain operation of the HVAC system to other parts of the building – do not disrupt HVAC to other areas of the building.

.2 Seal openings to HVAC system to prevent asbestos fibres from entering system.

3.3 Electrical System Isolation

.1 Isolate electrical systems which will remain energized in the Asbestos Work Area, with ground fault interrupters, otherwise disconnect existing power supply to the Asbestos Work Area. Power to other areas of the building must not be disrupted.

.2 Use only ground fault protected electrical services of sufficient capacity for electrical equipment used in the Asbestos Work Area.

.3 Ensure all openings on electrical equipment are water and dust resistant.

.4 Electrical panels are to be inspected by the Electrical Safety Authority and

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.5 Only CSA approved parts are to be used.

.6 Licenced electrician to install and inspect protection systems.

3.4 Preparation of Asbestos Abatement Work Area

.1 Isolate the Asbestos Work Area from the remainder of the building.

.2 Seal off openings in the perimeter including, but not limited to, the following:

.1 Heating and ventilation grills and outlets.

.2 Doorways.

.3 Elevator shafts.

.4 Corridors.

.5 Openings for lighting and electrical systems.

.6 Ceiling and floor openings above and below Work Area, including plumbing and conduit chases.

.3 Seal HVAC supply and return air louvres and grilles with two layers of polyethylene sheeting to prevent contamination of the system.

.4 Protect walls, floors, ceilings, finishes, millwork, electrical equipment and other fixed or stored materials within the Work Area that are not designated for abatement with a minimum of one layer of polyethylene sheeting. Secure sheeting against displacement and seal all joints, seams and perimeter interfaces with adhesive tape to prevent contamination.

.5 Where polyethylene is supported by the ceiling system, ensure the ceiling system is able to support the weight of the polyethylene.

.6 Ensure openings in walls, floors, ceilings etc. are completely sealed.

.7 Supply sufficient lighting to provide a safe working environment.

3.5 Maintenance of Asbestos Work Area

.1 Inspect the condition of the abatement enclosure on regular intervals to ensure integrity of the enclosure has not been compromised. Immediately correct deficiencies.

.2 Cleanup asbestos-containing waste on a regular basis during work and once removal work has been completed. Do not allow accumulation of waste materials within the Work Area. Cleaning to be done using HEPA vacuum and/or damp wiping. Do not use compressed air for cleaning. All waste to be placed in waste disposal containers and/or waste bags.

.3 Do not allow the accumulation of standing water within the Work Area.

.4 Inspect all HEPA filtered vacuums at the start and end of each shift to ensure:

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.1 equipment is operating according to manufacturers' specifications.

.2 HEPA filters are in good condition, not overloaded and are replaced as needed.

.5 Water supply is turned off prior to leaving the Work Area at the end of a shift.

.6 Exterior of waste bags should be cleaned using HEPA vacuum and/or damp wiping then placed into a second clean waste bag, sealed then immediately removed from the asbestos work enclosure.

.7 Asbestos waste should be removed from site, transported and disposed of in accordance with all Federal, Provincial and local regulatory requirements.

.8 Once asbestos-containing materials have been fully removed, thoroughly clean the Work Area and adjacent areas using HEPA vacuum and/or damp wiping.

.9 Asbestos Work Area is to be inspected by the Consultant prior to teardown. Teardown of the enclosure can only be undertaken upon receiving written approval from the Consultant that the work has been completed to the satisfaction of the Consultant.

3.6 Procedures

.1 Setup of the Abatement Work Area

.1 Undertake pre-removal survey for damage.

.2 Remove non-fixed items from the Work Area and store as directed by the Owner.

.3 Isolate HVAC system within the Work Area. Maintain HVAC system to other parts of the building.

.4 Post warning signs in English and French at all access points to the Asbestos Work Area in large clearly visible letters warning of an asbestos dust hazard and that access to the area is restricted to persons wearing protective clothing and equipment.

.5 Follow Type 2 cleaning operations (no enclosure required) to pre-clean the Asbestos Work Area prior to the start of any abatement work. Using HEPA vacuum or damp cloths (where damp cleaning does not create a hazard), remove visible dust and debris from surfaces within the Work Area. Do not use compressed air to clean up or remove dust from surfaces.

.6 Maintain emergency and fire exits.

.7 Isolate electrical system.

.8 Asbestos removal may not commence until the Work Area setup has been inspected by the Consultant and authorization to proceed with removal activities is given in writing.

.2 Asbestos Removal - General

.1 Supply amended water for the wetting of materials to be removed.

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.2 Remove asbestos-containing materials as specified for the particular material being abated.

.3 Cleanup waste on a regular basis.

.4 Place waste in asbestos appropriate containers in accordance with requirements of this section.

.5 All waste bins must be covered and secured with a lock when waste bin is not being used.

.6 Once bulk removal activities have been completed, clean all surfaces within the enclosure by HEPA vacuuming or wet wiping/mopping surfaces.

.7 Once final cleaning has been completed, the Work Area is to be inspected by the Consultant.

.8 Upon receiving approval from the Consultant that the Work Area has been adequately cleaned, apply lock-down sealant to all surfaces within the enclosure including surfaces from which asbestos-containing materials were removed.

.9 Apply lock-down sealant in accordance with manufacturer's instructions.

.10 Do not apply the lock-down sealant to materials that may be damaged by its application.

.11 Allow sufficient time for the lock-down agent to settle and dry prior to teardown of the enclosure unless air testing is to be undertaken in which case, teardown cannot occur until air monitoring results are found to be acceptable and written authorization to tear down is provided by the Consultant.

.3 Removal of Asbestos-Containing Floor Tile and Mastic

.1 Wet floor tiles with amended water before removing.

.2 Use non-powered hand scrapers to remove floor tile. Continue to wet floor tile with amended water during removal.

.3 Bag contaminated floor tile as it is removed.

.4 After removal, clean removal area with damp mop or HEPA vacuum. Do not use compressed air to cleanup dust or debris.

.5 Mastic/adhesive beneath floor tiles should be removed by scraping. **Solvent must not be used to remove mastic on any level. Note - follow Type 2 and Type 3 procedures (refer to the Type 2 and Type 3 sections) for the removal of mastic by mechanical equipment with and without HEPA attached filtration system).**

.6 All mastic/adhesive scrapings should be disposed of as asbestos waste.

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.4 Removal of Asbestos-Containing Ceiling Tiles (less than 7.5 square metres) in Areas Where Asbestos Fire Spray is NOT Present

.1 Establish and prepare the Work Area in accordance with the Type 1 asbestos procedures specified herein. Protect adjacent surfaces and restrict access to authorized personnel.

.2 Carefully remove asbestos-containing ceiling tiles individually and intact, without breaking, cutting, drilling, abrading, grinding, sanding or vibrating the tiles. Avoid disturbing materials or debris above the ceiling and minimize dust generation.

.3 Immediately place removed tiles into suitable, sealed asbestos waste containers or wrapping materials. Do not break or crush tiles to facilitate packaging. Handle and dispose of materials in accordance with the asbestos waste management requirements specified herein.

.4 Thoroughly HEPA-vacuum and wet-wipe the remaining ceiling grid, including exposed framing, supports, hangers, ledges and adjacent accessible surfaces, to remove all visible dust, debris and residues.

.5 Complete detailed cleaning of the Work Area, including floors, equipment, protective coverings and other affected surfaces, in accordance with the Type 1 cleaning requirements specified herein. Leave all surfaces free from visible dust and debris.

.6 Notify the Consultant when removal and cleaning are complete. Correct deficiencies identified during inspection. Following acceptance by the Consultant, apply an approved lock-down agent to designated cleaned surfaces, where specified, and allow sufficient drying time before removing protective measures and restoring the Work Area.

.5 Removal of Asbestos-Containing Drywall Adhesive (Mastic Pucks) from Concrete, Masonry and Other Building Surfaces

.1 Establish and prepare the Work Area in accordance with the Type 1 asbestos procedures specified herein. Protect adjacent surfaces and equipment from asbestos contamination.

.2 Prior to removal, thoroughly wet asbestos-containing mastic pucks with amended water. Maintain materials in a wetted condition throughout removal to minimize the release of asbestos dust and fibres.

.3 Carefully remove mastic pucks using non-powered hand-held scrapers or other suitable manual tools. Avoid unnecessary breakage, abrasion or disturbance of underlying building surfaces. Do not use powered grinders, sanders or other powered abrasive tools.

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.4 Remove adhered mastic residues from concrete, block, masonry and other affected surfaces using wet manual scraping. Continue until all visible mastic residues have been removed from designated removal locations.

.5 Collect removed mastic pucks, scrapings and debris as work progresses. Immediately place materials into suitable, sealed and labelled asbestos waste containers. Do not allow debris to accumulate or dry out.

.6 Thoroughly clean affected surfaces, including removal locations, adjacent ledges, floors and other potentially contaminated surfaces, using HEPA-filtered vacuum equipment and wet wiping, as appropriate. Repeat cleaning until surfaces are free from visible mastic residues, dust and debris. Do not use compressed air or dry sweeping.

.7 Dispose of all removed mastic, scrapings, contaminated cleaning materials and other asbestos waste in accordance with the waste management requirements specified herein.

.8 Notify the Consultant where mastic cannot be adequately removed using the specified methods, or where material conditions or proposed removal methods may require a higher asbestos work classification. Do not proceed with alternative removal methods without the Consultant's review.

.6 Removal of Drywall with Asbestos-Containing Joint-Filling Compound (Less Than 1 m²).

.1 Undertake removal of less than 1 m² of drywall containing asbestos-containing joint-filling compound using Type 1 asbestos procedures in accordance with O. Reg. 278/05 and the Project Contract Documents. In accordance with the Regulation, determine the work classification based on the total area of drywall removed consecutively within a room or enclosed area, regardless of whether the work is divided into smaller openings or separate operations. Where the total area is 1 m² or greater, follow Type 2 asbestos procedures. Do not divide work into smaller operations to avoid the applicable work classification.

.2 Establish and isolate the immediate Work Area using appropriate barriers and protective measures. Install polyethylene drop sheets beneath and surrounding the removal location.

.3 Remove designated drywall using non-powered hand tools and controlled demolition methods to minimize dust generation and asbestos fibre release. Dampen materials where practicable to control dust.

.4 Remove drywall in manageable sections, minimizing unnecessary breakage and fragmentation. Place removed materials directly into suitably sized asbestos waste containers.

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.5 Remove wall insulation within the designated demolition area, where required. Dispose of contaminated insulation, drywall fragments, fasteners and associated debris as asbestos waste.

.6 Inspect exposed framing, wall and ceiling cavities, joints and penetrations for residual asbestos-containing materials, dust and debris. Remove visible contamination using HEPA-filtered vacuum equipment and/or wet cleaning methods.

.7 Following removal, thoroughly HEPA vacuum and damp wipe affected surfaces, tools, equipment and surrounding areas. Remove all visible dust, debris and residues.

.8 Collect, package and dispose of asbestos waste in accordance with the requirements of this section.

.9 Have the completed removal and cleaning inspected by the Consultant, where specified. Correct identified deficiencies prior to removing Work Area isolation and protective coverings.

.7 Removal of Confirmed and Presumed Asbestos-Containing Gaskets.

.1 Remove designated gaskets confirmed or presumed to contain asbestos using Type 1 asbestos procedures in accordance with O. Reg. 278/05 and the Project Contract Documents, provided the materials can be removed without becoming friable.

.2 Establish and isolate the immediate Work Area as required. Install polyethylene drop sheets beneath and surrounding removal locations to contain dust and debris.

.3 Remove gaskets using non-powered hand tools and controlled methods to minimize breakage, abrasion and asbestos fibre release. Thoroughly wet gasket materials prior to and during removal, where practicable.

.4 Carefully remove residual gasket materials adhering to flanges, fittings and other surfaces using hand tools and wet methods. Do not use powered grinding, sanding or abrasive cleaning equipment.

.5 Place removed gaskets, fragments and associated debris directly into suitable asbestos waste containers.

.6 Following removal, thoroughly HEPA vacuum and wet wipe affected surfaces, tools, equipment and surrounding areas. Remove all visible dust, debris and residues.

.7 Collect, package and dispose of asbestos waste in accordance with the requirements of this Section.

.8 Where gaskets cannot be removed without significant breakage, pulverization or other disturbance that may render the material friable, suspend the affected work and implement the appropriate asbestos procedures before proceeding.

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.8 Removal of Asbestos-Containing Window Butyl

.1 Remove designated non-friable window butyl sealants confirmed or presumed to contain asbestos using Type 1 asbestos procedures in accordance with O. Reg. 278/05 and the Project Contract Documents.

.2 Establish and isolate the immediate Work Area as required. Install polyethylene drop sheets beneath and surrounding removal locations to contain dust and debris.

.3 Thoroughly wet butyl sealants with amended water prior to removal and maintain materials in a wet condition throughout the removal process, where practicable.

.4 Remove butyl using non-powered hand tools. Do not use powered grinding, sanding or abrasive removal equipment.

.5 Remove residual butyl adhering to window frames, glazing and adjacent substrates using suitable hand tools and wet methods.

.6 Place removed butyl, fragments and associated debris directly into suitable asbestos waste containers.

.7 Following removal, thoroughly HEPA vacuum and wet wipe affected surfaces, tools, equipment and surrounding areas. Remove all visible dust, debris and residues.

.8 Collect, package and dispose of asbestos waste in accordance with the requirements of this Section.

.9 Removal of Presumed Asbestos-Containing Blackboards

.1 Remove designated blackboards presumed to contain asbestos using Type 1 asbestos procedures in accordance with O. Reg. 278/05 and the Project Contract Documents, provided the materials remain non-friable during removal.

.2 Establish and isolate the immediate Work Area as required. Install polyethylene drop sheets beneath and surrounding removal locations to contain dust and debris.

.3 Carefully detach and remove blackboards intact, without cutting, breaking, drilling, grinding, sanding or otherwise damaging the materials. Use non-powered hand tools and controlled removal methods to minimize asbestos fibre release.

.4 Where breakage is unavoidable or occurs during removal, thoroughly wet affected materials using amended water and maintain them in a wet condition during handling and removal. Use non-powered hand tools to minimize further breakage, fragmentation and dust generation.

.5 Carefully collect all broken fragments and associated debris using HEPA-filtered vacuum equipment and/or wet cleaning methods. Place directly into suitable asbestos waste containers.

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.6 Wrap intact blackboards in a minimum of two layers of 6-mil polyethylene sheeting. Fully seal all seams, joints and openings with adhesive tape to provide secure, leak-tight packaging. Protect sharp edges and corners against puncturing or tearing of the polyethylene.

.7 Handle and transport wrapped blackboards carefully to prevent breakage or damage to the packaging. Dispose of blackboards, fragments and associated debris as asbestos waste in accordance with the requirements of this section.

.8 Following removal, thoroughly HEPA vacuum and wet wipe affected surfaces, tools, equipment and surrounding areas. Remove all visible dust, debris and residues.

3.7 Dismantling of the Abatement Enclosure

.1 Upon completion of asbestos abatement work and written authorization to tear down the enclosure has been provided by the Consultant, perform the following:

.1 Wet wipe or HEPA vacuum all tools and equipment prior to removal from the Asbestos Work Area.

.2 Clean all polyethylene surfaces by wet wiping or HEPA vacuuming prior to removal.

.3 Remove polyethylene wall sheets by carefully folding sheets with asbestos exposed side folded in. Dispose of as asbestos waste.

.4 Clean any debris left behind during dismantling procedures by wet wiping and/or HEPA vacuuming surfaces where the abatement enclosure once stood.

.5 Remove other materials from site.

.6 All HEPA filters taken out of service are to be disposed of as asbestos waste.

.7 Seal all inlet and exhaust openings on vacuums when units are shut down.

.8 Re-establish items removed from the Work Area.

.9 Restore HVAC system to the Work Area including removal of capped ducts (if applicable).

.10 Vacuum Work Area and ensure the workspace is clean prior to demobilizing.

END OF SECTION

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PART 1 GENERAL

1.1 Related Work

.1 This section is to be read in conjunction with all other sections so as to comply with the General Conditions of the Contract.

.2 Refer to the following related sections:

.1 Section 02 82 00.01 - Type 1 Asbestos Abatement (Minimum Precautions)

.2 Section 02 82 00.03 - Type 3 Asbestos Abatement (Maximum Precautions)

.3 Section 02 82 13.13 - Glove Bag Asbestos Abatement Operations (Type 2)

.4 Asbestos Abatement Floor Plan Drawings

1.2 Regulations

.1 Work must comply with the following regulations and guidance documents:

.1 Occupational Health and Safety Act (OHSA), R.S.O. 1990

.2 Environmental Protection Act, R.S.O. 1990

.3 Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05

.4 Designated Substances, Ontario Regulation 490/09

.5 General – Waste Management, Ontario Regulation 347/90, Environmental Protection Act

.6 Hazardous Products Act

.7 Transportation of Dangerous Goods Act

.8 Lead on Construction Projects, Ministry of Labour Guidance Document, under the OHSA

.9 Silica on Construction Projects, Ministry of Labour Guidance Document, under the OHSA

.10 EACC Lead Guideline for Construction, Renovation, Maintenance or Repair

.11 EACC Mould Abatement Guidelines

.12 Alert – Mould in Workplace Buildings, Ontario Ministry of Labour

.2 Work must comply with all applicable federal, provincial, and local requirements. In any case where a conflict arises between or among the regulations, guidance documents or with specifications provided herein, the more stringent requirements shall be followed.

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1.3 Definitions

.1 *Air Samples* - samples collected by drawing a specified volume of air through specified sample filters.

.2 *Amended Water* - water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 *Asbestos* - any of the fibrous silicates listed in O. Reg. 278/05.

.4 *Asbestos-Containing Material (ACM)* – a material that contains 0.5 per cent or more asbestos by dry weight and as identified under Existing Conditions.

.5 *Asbestos Work Area* – the area where asbestos-containing materials have been identified for removal, cleanup or that may be disturbed and to which general access is prohibited.

.6 *Asbestos Waste* – refers to asbestos-containing materials and asbestos-contaminated materials or products that have been removed from the Asbestos Work Area.

.7 *Building* - defined by the Regulation includes a structure, vault, chamber or tunnel and including (without limitation) its electrical, plumbing, heating and air handling equipment, including rigid duct work of a building or structure.

.8 *Competent Worker* - a worker who is qualified because of knowledge, training and experience to do the specific work, who is familiar with the Act and with the provisions of the Regulations that apply to the work, and who knows of all potential or actual danger to health or safety in the work.

.9 *Construction* – defined by the Act as including "erection, alteration, repair, dismantling, demolition, structural maintenance, painting, land clearing, earth moving, grading, excavating, trenching, digging, boring, drilling, blasting, or concreting, the installation of any machinery or plant, and any work or undertaking in connection with a project".

.10 *Consultant* – Owner's representative for work associated with asbestos abatement work.

.11 *Contractor* – Contractor or sub-contractor undertaking the asbestos abatement work and holding the Notice of Project.

.12 *Friable Material* – a material that when dry, can be crumbled, pulverized or powdered by hand pressure, or is crumbled, pulverized or powdered.

.13 *HEPA Filter* - a high efficiency particulate aerosol filter capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.14 *HEPA Integrity Test (or DOP test)* – a method to test HEPA filters installed in vacuums and negative pressure units for leaks. The testing must be completed in conformance with current industry standards of practice.

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.15 *Inspector* – Owner's authorized representative (i.e. Consultant) to ensure work is undertaken in accordance with the Contract requirements.

.16 *Lock-down sealant* – compound used to "lock-down" microscopic residual asbestos fibers present after the removal of asbestos containing materials.

.17 *Negative Air* - a term used to refer to the system of air filtration used for controlling airborne asbestos at asbestos removal projects through the maintenance of lower air pressure on the inside of an enclosure than exists on the outside

.18 *Non-friable Material* - a material that cannot be crumbled, pulverized or powdered by hand pressure.

.19 *Occupied Area* – an area outside of the asbestos abatement Work Area.

.20 *Owner* - defined by the Act as including a "trustee, receiver, mortgagee in possession, tenant, lessee, or occupier of any lands or premises used or to be used as a workplace, and a person who acts for or on behalf of an owner as an agent or delegate".

.21 *PCM* – Phase Contract Microscopy

.22 *Presumed Asbestos-Containing Materials (PACM)*: Materials assumed to contain asbestos based on their composition, age, appearance, location or other available information, but not confirmed through laboratory analysis. Such materials shall be treated as asbestos-containing unless demonstrated otherwise through appropriate sampling and analysis, in accordance with O. Reg. 278/05 and as specified herein.

.23 *Polyethylene* - polyethylene sheeting or rip-proof polyethylene sheeting used to construct that abatement enclosure to isolate Occupied areas of the building from the asbestos Work Area or for the protection of materials.

.24 *Sprayer* - garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray.

.25 *Supervisor* – person in charge of the workplace or authority over a worker.

.26 *Suspect Asbestos-Containing Materials (SACM)*: Materials potentially containing asbestos that were not identified during the assessment but may be uncovered during renovation or demolition. Such materials shall be presumed asbestos-containing unless laboratory analysis confirms otherwise.

.27 *TEM (Transmission Electron Microscopy)* - An analytical method used to identify and quantify asbestos fibres in air or bulk material samples through high-resolution electron microscopy. TEM allows for the detection of very fine asbestos fibres and the identification of asbestos mineral types based on their physical and chemical characteristics.

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.28 *Visitors* – Engineer, Contractor, Consultant or other designated representatives of the Owner and representatives of Regulatory agencies.

1.4 Existing Conditions

.1 Refer to Item 1.4 of Section 02 82 00.03.

1.5 General Requirements

.1 Refer to Item 1.5 of Section 02 82 00.03.

1.6 Description of Work

.1 Refer to Item 1.6 of Section 02 82 00.03.

1.7 Schedule

.1 Refer to Item 1.7 of Section 02 82 00.03.

1.8 Submittals

.1 Refer to Item 1.8 of Section 02 82 00.03.

1.9 Instruction and Training

.1 Provide instruction and training to all workers on the hazards of asbestos exposure, personal hygiene and work practices, and in the use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at a minimum:

.1 Fitting of equipment

.2 Inspection and maintenance of equipment

.3 Disinfecting of equipment

.4 Limitations of equipment

.3 Type 2 procedures including details of the specified work of this section.

.4 Operational procedures including:

.1 Preparation of the Work Area

.2 Dust control

.3 Personal protective clothing and equipment

.4 Clean-up of the Work Area and waste removal

.5 First Aid training in accordance with the OHSA.

.6 Instruction and training must be provided by a competent, qualified person.

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1.10 Worker Protection

.1 Only persons wearing protective clothing and equipment (i.e. respirators) may enter a Work Area where there is an asbestos dust hazard.

.2 Requirements for the use of protective clothing are as follows:

.1 Be made of a material that does not readily retain or permit penetration of asbestos fibres.

.2 Consist of head covering and full body covering that fits snugly at the ankles, wrists and neck to prevent asbestos fibres from reaching the garments and skin under the protective clothing.

.3 Must include suitable footwear.

.4 Must be repaired or replaced if torn.

.5 Must be decontaminated by damp wiping or HEPA vacuuming before leaving the Work Area

.3 Requirements for the use of respirators are as follows:

.1 Ensure all respirators are NIOSH-approved, properly fitted, maintained and used in accordance with Section 13 and Table 2 of O. Reg. 278/05. Provide higher levels of respiratory protection where required by the nature of the work, asbestos material characteristics and applicable regulatory requirements.

.2 NIOSH certified respirators are to be used.

.3 Written procedures must be in place for the selection, care and use of respirators. A copy of the procedures must be given to and reviewed with each worker who is required to wear a respirator.

.4 A worker must not be assigned to do work requiring the use of a respirator unless the worker is physically able to do the work while wearing the respirator.

.5 Respirators must be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is a hood or helmet type.

.6 Respirators must be assigned to a worker for his or her exclusive use, if practical.

.7 Respirators must be used and maintained in accordance with written procedures that are consistent with the manufacturer's specifications.

.8 Replace filters as necessary in accordance with manufacturer’s instructions.

.9 Respirators that are assigned to one worker must be cleaned, disinfected and inspected at least after use on each shift.

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.10 Respirators that are used by more than one worker must be cleaned, disinfected and inspected after each use.

.11 Damaged or deteriorated respirator parts must be replaced before the respirator is used by a worker.

.12 Respirators must be stored in a convenient, clean and sanitary location when not in use.

.13 Workers must receive training in the use, cleaning and disposal of respirators and protective clothing.

.14 The respirator training must include the limitations of the equipment, inspection and maintenance, proper fitting and cleaning and disinfection.

.15 All workers donning a respirator must be fit tested for that respirator. Fit testing must be provided by a competent person.

.16 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters should be worn by workers during the teardown of Type 2 and Type 3 enclosures following Type 2 precautions.

.4 Requirements for other personal protective equipment are as follows:

.1 Hard hats, safety shoes, safety glasses and protective gloves should be worn by workers in accordance with construction safety regulations.

.5 Other safety measures to be followed include:

.1 Eating, drinking, chewing or smoking must not be permitted in the Work Area.

.2 Workers must dispose of protective clothing as contaminated waste before leaving the Asbestos Work Area.

.3 Ensure workers wash hands and face with soap and water when leaving the Asbestos Work Area. Facilities for washing must be located outside the Work Area.

1.11 Visitor Protection

.1 Refer to Item 1.13 of Section 02 82 00.03.

1.12 Supervision

.1 Refer to Item 1.14 of Section 02 82 00.03.

1.13 Notification

.1 Inform all sub-trades of the presence of asbestos-containing materials as identified herein.

.2 Submit to the Owner and Consultant a copy of all notifications prior to the start of work.

.3 Notify disposal site in advance of delivery of asbestos waste in accordance with the requirements of the Waste Management Regulation (O. Reg. 347/90).

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.4 Notify the Consultant, Owner and Joint Occupational Health and Safety Committee and the Ministry of Labour if friable materials suspected of containing asbestos that was not previously identified become uncovered as required in O. Reg. 278/05.

1.14 Insurance

.1 Refer to Item 1.16 of Section 02 82 00.03.

1.15 Inspection

.1 Inspections of the Asbestos Work Area may be undertaken by the Consultant:

.1 At any time during abatement and/or cleanup activities with or without prior notice.

.2 Within or around the abatement Work Area.

.2 Milestone inspections may include any or all of the following:

.1 Pre-abatement Inspection – to inspect the setup of containment. Contractor not to proceed with contaminated work until written authorization is provided by the Consultant.

.2 Bulk or Spot Inspection – to inspect active asbestos removal activities.

.3 Final Inspection – to verify the scope of abatement work has been completed in accordance with Contract documents and that the Work Area is visibly clean and free of dust and debris. Contractor not to proceed with the application of the lock-down agent until written authorization is provided by the Consultant. If clearance air monitoring is required, it will be undertaken only after the Work Area has passed this final inspection.

.3 Consultant engaged by the Owner to perform inspections and air monitoring is authorized to identify deficiencies in the asbestos work and provide site instructions to ensure compliance with Contract requirements.

.4 Failure to pass the inspections noted above may require the Contractor to expend additional resources to provide satisfactory performance at no additional charge to the Owner. The Consultant is empowered by the Owner to inspect for final cleanliness at completion.

.5 The Contractor will incur the cost of the Consultant's site visit should the Contractor not be ready for a scheduled milestone inspection by the Consultant.

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

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.7 Additional inspections or air monitoring that may be required as a result of the Contractor's failure to perform the work satisfactorily may result in back charges to the Contractor at the Owner's discretion.

1.16 Air Monitoring

.1 Air monitoring may be undertaken by the Consultant:

.1 At any time during abatement and/or cleanup activities.

.2 From inside and/or outside of the asbestos abatement Work Area.

.3 On workers engaged in abatement and/or cleaning activities to ensure respiratory safety factors are not exceeded.

.2 Air monitoring will be undertaken following NIOSH Method 7400, ASBESTOS and OTHER FIBERS by PCM (Phase Contrast Microscopy).

.3 If air monitoring results indicate areas outside of the Asbestos Work Area/enclosure (i.e. Occupied space) are in excess of 0.05 fibres per millilitre of air (fibre/mL), the following measures are to be implemented by the Contractor:

.1 Stop work within the Asbestos Work Area.

.2 Notify Owner and Consultant who are to investigate the concern.

.3 Work is not to resume until written authorization is provided by the Consultant.

.4 Isolate and clean the contaminated area following Type 2 cleanup measures (no enclosure).

.5 Maintain isolation of the impacted area and repeat cleaning efforts until results of visual inspection and subsequent air monitoring are found to be acceptable by the Consultant.

.6 Implement other measures as directed by the Consultant to remedy the situation. These may include the installation of negative air units within the impacted area.

.4 If air monitoring results within the Asbestos Work Area are in excess of the respirator protection factor, the following measures are to be implemented by the Contractor:

.1 Stop work within the Asbestos Work Area.

.2 Workers must exit the Asbestos Work Area via the decontamination facility.

.3 Consultant should be notified and the area not re-entered until measures are taken to resolve the issue – workers are not permitted to re-enter until advised by the Consultant in writing.

.5 Costs associated with additional inspections and air monitoring due to deficiencies in the maintenance of the Asbestos Work Area resulting in elevated asbestos fibre levels inside or outside the Work Area may be charged back to the Contractor at the discretion of the Owner.

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PART 2 PRODUCTS

2.1 Materials and Equipment

.1 General Materials

.1 *Amended Water* - water containing a surfactant to reduce water surface tension. Surfactant added at a concentration to provide penetration and wetting of asbestos fibres.

.2 *Lock-Down Sealer* - non-staining, clear, water-dispersible material that is designed for the purpose of trapping residual asbestos fibres. The sealer should remain tacky on surface for at least 8 hours and shall have flame spread and smoke developed rating both less than 50.

.3 *Polyethylene* – minimum 6 mil (0.15 mm) thick unless otherwise specified; in sheet size to minimize joints.

.4 *FR Polyethylene* - minimum 6 mil (0.15 mm) thick, woven fibre reinforced fabric bonded both sides with polyethylene.

.5 *Tape* - fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

.6 *Plastic Bags* - minimum 6 mil (0.15 mm) thick sheet polyethylene. Bag seams shall be sufficiently strong to resist pressure and shocks that occur under normal conditions of transport.

.7 *Drums* - sturdy non-reusable, steel, aluminum, or plastic, with tight-fitting lids acceptable to the Ontario Ministry of Environment and waste disposal facility.

.8 *Asbestos Waste Containers* - contain waste in two separate containers. The inner container shall be a 6 mil (0.15 mm) thick sealable polyethylene bag. Outer container shall be a sealable metal or fibre type where there are sharp objects included in the waste material; otherwise the outer container may be sealable metal or fibre type or a second 6 mil (0.15 mm) thick sealable polyethylene bag. Containers should be labelled as prescribed in O. Reg. 347/90 and O. Reg. 278/05.

.9 *Duct Tape* - Good quality, water resistant plastic type.

.10 *Protective Clothing* – shall be provided by the employer and worn by every worker who enters the Work Area. The protective clothing,

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

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.2 shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing,

.3 shall include suitable footwear, and

.4 shall be repaired or replaced if torn.

.2 Equipment

.1 *Vacuums* - HEPA filtered wet/dry type with accessories adequate to perform removal and cleanup work or to provide negative pressure in smaller Type 2 Work Areas.

.2 *Negative Air Units* - two-stage HEPA filter system and accessories required to exhaust air to outside of building.

.3 Warning Signage

.1 Provide warning signs to convey the following:

.1 Caution Asbestos Dust Hazard

.2 Work area is restricted to persons wearing protective clothing and equipment

.3 Breathing asbestos dust may cause serious bodily harm

.4 Entry is prohibited except to authorized persons.

.5 Drinking, eating and smoking are prohibited in this area.

.2 Place placards on vehicles transporting asbestos waste in accordance with Transportation of Dangerous Goods Act.

2.2 Decontamination Facilities

.1 Decontamination facilities shall include:

.1 Clean change room.

.2 Asbestos waste transfer room with curtained doorway. A transfer room may not be required when abatement work can be fully completed within an 8-hour period including time required for the setup, removal work, visual clearance, application of lock-down agent and teardown of the containment.

.3 Wash up facility.

2.3 Negative Pressure Ventilation System Using Negative Pressure Machines

.1 Provide negative pressure ventilation system that is separate from building mechanical system meeting the following requirements:

.1 DOP testing is undertaken per the requirements of this section.

.2 Make-up air is drawn through the decontamination facility.

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.3 Exhaust air is vented through the use of impermeable flexible ducting (i.e. manufactured product) to the exterior of the Asbestos Work Area or to the exterior of the building.

.4 When venting indoors, metal reinforced polyethylene discharge ducting should be used to protect ducting from damage or collapse.

.5 Provide at least three exchanges of the total volume of air within the Asbestos Work Area per hour.

.6 Negative air units are placed so as to maximize distance between units.

.7 Filters are replaced in accordance with manufacturers' instructions.

2.4 Negative Pressure Ventilation System Using HEPA Vacuums

.1 Provide negative pressure within the enclosure using HEPA filtered vacuums meeting the following requirements:

.1 DOP testing is undertaken per the requirements of this section.

.2 Vacuum is left outside the enclosure and hose extends into the Asbestos Work Area.

.3 Vacuum is operated continuously for the duration of removal of asbestos-containing materials and cleanup activities until written authorization has been provided by the Consultant to teardown the enclosure.

.4 HEPA filters are to be replaced in accordance with manufacturers' instructions.

PART 3 EXECUTION

3.1 Project Requirements

.1 Comply with the following requirements when performing the following Type 2 operations within the Work Area.

.1 Removing all or part of a false ceiling to obtain access to a Work Area, if asbestos-containing material is likely to be lying on the surface of the false ceiling.

.2 The removal or disturbance of one square metre or less of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of machinery or equipment or a building, aircraft, locomotive, railway car, vehicle or ship.

.3 Enclosing friable asbestos-containing material.

.4 Applying tape or a sealant or other covering to pipe or boiler insulation that is asbestos-containing material.

.5 Installing or removing ceiling tiles that are asbestos-containing material, if the tiles cover an area of 7.5 square metres or more and are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.

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.6 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,

.1 the material is not wetted to control the spread of dust or fibres, and

.2 the work is done only by means of non-powered hand-held tools.

.7 Removing one square metre or more of drywall in which joint filling compounds that are asbestos-containing material have been used.

.8 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.

.9 Removing insulation that is asbestos-containing material from a pipe, duct or similar structure using a glove bag.

.10 Cleaning or removing filters used in air handling equipment in a building that has sprayed fireproofing that is asbestos-containing material.

.11 An operation that,

.1 not mentioned in any of paragraphs 1 to 10,

.2 may expose a worker to asbestos, and

.3 is not classified as a Type 1 or Type 3 operation.

.12 Contractor to quantify all materials prior to submitting bids.

3.2 HVAC System Isolation

.1 Shut down HVAC system to Asbestos Work Area. Maintain operation of the HVAC system to other parts of the building – do not disrupt HVAC to other areas of the building.

.2 Cut and cap HVAC supply and return air ductwork at points of entry into the asbestos abatement Work Areas to isolate the Work Areas from the remainder of the HVAC system. Provide rigid, airtight caps securely fastened to duct ends, with all joints, seams and penetrations sealed to prevent the migration of asbestos fibres. Coordinate HVAC shutdown and isolation with the Owner. Undertake cutting, capping and associated disturbance of presumed asbestos-contaminated ductwork using O. Reg. 278/05 Type 3 procedures.

.3 Seal openings to HVAC system with polyethylene sheeting to prevent asbestos fibres from entering system.

.4 HVAC system serving the Asbestos Work Area is to remain isolated for the duration of the work until completion.

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3.3 Electrical System Isolation

.1 Isolate electrical systems which will remain energized in the Asbestos Work Area, with ground fault interrupters, otherwise disconnect existing power supply to the Asbestos Work Area. Power to other areas of the building must not be disrupted.

.2 Use only ground fault protected electrical services of sufficient capacity for electrical equipment used in the Asbestos Work Area.

.3 Ensure all openings on electrical equipment are water and dust resistant.

.4 Electrical panels are to be inspected by the Electrical Safety Authority and

.5 Only CSA approved parts are to be used.

.6 Licenced electrician to install and inspect protection systems.

3.4 Asbestos Abatement (Type 2 – Enclosure Required)

.1 Establish and isolate designated Type 2 asbestos Work Areas from adjacent occupied and non-Work Areas using sealed enclosures constructed of polyethylene sheeting or other suitable materials impervious to asbestos. Maintain effective containment throughout asbestos disturbance, cleaning and waste removal.

.2 Inspect Work Areas for openings, penetrations, gaps and other potential pathways for asbestos fibre migration. Seal all openings communicating with adjacent areas, including, but not limited to:

- heating, ventilation and air-conditioning openings, grilles and ducts
- doorways, corridors and elevator shafts
- openings associated with lighting, electrical and mechanical systems
- ceiling and floor openings, including plumbing, conduit and service chases
- openings at structural members, wall and ceiling intersections, and other concealed spaces

.3 Shut down and isolate HVAC systems serving the Work Area for the duration of asbestos abatement. Where the HVAC system cannot remain shut down, temporarily shut it down to permit cutting and hard-capping of supply, return and exhaust ductwork at the Work Area boundaries, allowing the system to continue operating in unaffected areas. Complete ductwork cutting and capping under the applicable asbestos procedures. Seal all remaining HVAC openings with two layers of minimum 6-mil polyethylene sheeting secured with adhesive tape to prevent asbestos fibre migration.

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.4 Construct freestanding enclosures where required, extending from floor level to the underside of the structure above or another suitable solid boundary. Use adequately braced wood framing spaced at a maximum of 600 mm on centre, covered with minimum 6-mil polyethylene sheeting. Continuously seal all joints, seams, penetrations and perimeter interfaces. Provide transparent viewing panels to permit observation of the entire Work Area from outside the enclosure.

.5 Install and seal upper barriers at structural intersections, penetrations, ceiling openings and other locations where asbestos contamination could migrate beyond the enclosure. Ensure all enclosure components are securely installed and maintained airtight to the extent practicable.

.6 Protect existing walls, ceilings and other surfaces within the Work Area, where not designated for asbestos removal or cleaning, with two layers of minimum 6-mil polyethylene sheeting. Secure coverings against displacement and continuously seal joints and perimeter interfaces. Do not cover surfaces containing loose asbestos contamination without first completing appropriate HEPA vacuuming or wet cleaning.

.7 Protect floors with two layers of minimum 6-mil fibre-reinforced, tear-resistant polyethylene sheeting, extending at least 300 mm up adjacent walls and vertical surfaces. Overlap and continuously seal all seams and perimeter interfaces. Provide additional protection over carpeting, finished floors and surfaces susceptible to damage.

.8 Where polyethylene sheeting or other enclosure materials are supported by an existing suspended ceiling system, verify that the system can safely support the imposed loads. Provide independent supports where necessary.

.9 Remove or protect equipment, furnishings and other movable items before commencing asbestos disturbance. Seal wall-mounted and stationary equipment with polyethylene sheeting where practicable. Thoroughly clean any exposed or potentially contaminated equipment and surfaces before completion of abatement.

.10 Provide sealed entrances, exits and waste transfer openings using overlapping polyethylene curtains or other suitable arrangements to minimize the release of asbestos fibres. Provide facilities for HEPA vacuuming or damp wiping protective clothing before removal, disposal of contaminated protective clothing, and washing of hands and face, in accordance with O. Reg. 278/05.

.11 Provide adequate temporary lighting and safe access within the enclosure. Maintain required emergency access and egress and protect electrical installations and other building systems from damage and water infiltration.

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.12 Post asbestos hazard warning signs at all entrances and restrict access to authorized personnel wearing appropriate protective clothing and respiratory protection.

.13 Notify the Consultant when enclosure construction, HVAC isolation, upper seals, surface protection and worker decontamination arrangements are complete. Obtain acceptance of the Work Area setup before commencing asbestos disturbance or removal.

.14 Maintain and regularly inspect enclosure integrity, protective coverings, HVAC isolation and access arrangements throughout abatement operations. Immediately repair damaged, displaced or inadequately sealed materials. Suspend asbestos-disturbing activities where containment integrity is compromised until deficiencies are corrected.

.15 Following completion of asbestos removal, thoroughly clean all exposed and accessible surfaces within the Work Area, including structural, mechanical, electrical and architectural components, using HEPA-filtered vacuum equipment and wet wiping, as appropriate. Remove all visible asbestos-containing residues, dust and debris in accordance with the cleaning requirements specified elsewhere herein.

.16 Do not dismantle enclosures or remove protective coverings until asbestos removal, detailed cleaning, waste removal, required inspections and any specified clearance air monitoring have been satisfactorily completed and the Consultant has authorized enclosure removal.

.17 Dismantle enclosures in a controlled manner, minimizing disturbance of accumulated dust. Wet and dispose of contaminated polyethylene sheeting and disposable enclosure materials as asbestos waste. Clean reusable equipment and enclosure components before removal from the Work Area.

3.5 Maintenance of Asbestos Work Area

.1 Inspect the condition of the abatement enclosure on regular intervals to ensure integrity of the enclosure has not been compromised. Immediately correct deficiencies.

.2 Cleanup asbestos-containing waste on a regular basis during work and once removal work has been completed. Do not allow accumulation of waste materials within the Work Area. Cleaning to be done using HEPA vacuum and/or damp wiping. Do not use compressed air for cleaning. All waste to be placed in waste disposal containers and/or waste bags.

.3 Do not allow the accumulation of standing water within the Work Area.

.4 Inspect all HEPA filtered equipment including negative pressure machines and vacuums at the start and end of each shift to ensure:

.1 equipment is operating according to manufacturers' specifications.

.2 HEPA filters are in good condition, not overloaded and are replaced as needed.

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.3 ducting is intact and venting properly.

.5 Water supply is turned off prior to leaving the Work Area at the end of a shift.

.6 Exterior of waste bags should be cleaned using HEPA vacuum and/or damp wiping then placed into a second clean waste bag, sealed then immediately removed from the asbestos work enclosure.

.7 Asbestos waste should be removed from site, transported and disposed of in accordance with all Federal, Provincial and local regulatory requirements.

.8 Once asbestos-containing materials have been fully removed, thoroughly clean the Work Area and adjacent areas using HEPA vacuum and/or damp wiping.

.9 Asbestos Work Area is to be inspected by the Consultant prior to teardown. Teardown of the enclosure can only be undertaken upon receiving written approval from the Consultant that the work has been completed to the satisfaction of the Consultant.

3.6 Procedures

.1 Setup of the Abatement Work Area

.1 Undertake pre-removal survey for damage.

.2 Remove non-fixed items from the Work Area and store as directed by the Owner.

.3 Isolate HVAC system within the Work Area. Maintain HVAC system to other parts of the building.

.4 Post warning signs in English and French at all access points to the Asbestos Work Area in large clearly visible letters warning of an asbestos dust hazard and that access to the area is restricted to persons wearing protective clothing and equipment.

.5 Follow Type 2 cleaning operations to pre-clean the Asbestos Work Area prior to the start of any abatement work. Using HEPA vacuum or damp cloths (where damp cleaning does not create a hazard), remove visible dust and debris from surfaces within the Work Area. Do not use compressed air to clean up or remove dust from surfaces.

.6 Setup the polyethylene enclosure to contain the Asbestos Work Area for the removal of less than one (1) square metre of friable asbestos-containing material.

.7 Setup the polyethylene enclosure to contain the Asbestos Work Area for the removal of a false ceiling where there is fallen asbestos-containing sprayed-fireproofing or other asbestos-containing debris present.

.8 Setup the polyethylene enclosure to contain the Asbestos Work Area for the removal of asbestos-containing pipe insulation following glove bag procedures.

.9 Maintain emergency and fire exits.

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.10 Install and operate the HEPA filtered negative air system appropriate for the size of the Work Area and in accordance with requirements of this section.

.11 Isolate electrical system.

.12 Asbestos removal may not commence until the Work Area setup has been inspected by the Consultant and authorization to proceed with removal activities is given in writing.

.2 Asbestos Removal - General

.1 Supply amended water for the wetting of materials to be removed.

.2 Remove asbestos-containing materials as specified for the particular material being abated.

.3 Cleanup waste on a regular basis.

.4 Place waste in asbestos appropriate containers in accordance with requirements of this section.

.5 All waste bins must be covered and secured with a lock when waste bin is not being used.

.6 Once bulk removal activities have been completed, clean all surfaces within the enclosure by HEPA vacuuming or wet wiping/mopping surfaces.

.7 Once final cleaning has been completed, the Work Area is to be inspected by the Consultant. Consultant to be given 24-hour notice for a pending inspection.

.8 Upon receiving approval from the Consultant that the Work Area has been adequately cleaned, apply lock-down sealant to all surfaces within the enclosure including surfaces from which asbestos-containing materials were removed.

.9 Apply lock-down sealant in accordance with manufacturer's instructions.

.10 Do not apply the lock-down sealant to materials that may be damaged by its application.

.11 Allow sufficient time for the lock-down agent to settle and dry prior to teardown of the enclosure unless air testing is to be undertaken in which case, teardown cannot occur until air monitoring results are found to be acceptable and written authorization to tear down is provided by the Consultant.

.3 Type 2 – Procedure for Pre-cleaning of Work Areas (HEPA Vacuuming and Wet Wiping)

.1 Undertake pre-cleaning of designated Work Areas using Type 2 asbestos precautions in accordance with O. Reg. 278/05 and the Project Contract Documents, prior to establishing asbestos abatement enclosures or commencing other activities that may disturb potentially asbestos-contaminated dust or debris.

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.2 Establish and isolate the Work Area from adjacent occupied and non-work areas using caution tape, barriers and appropriate asbestos warning signage. Restrict access to authorized personnel.

.3 Provide workers with appropriate respiratory protection and disposable protective clothing in accordance with the requirements of this Section.

.4 Shut down and isolate HVAC systems serving the Work Area, as required. Seal supply, return and exhaust air openings to prevent the migration of asbestos fibres into the ventilation system or adjacent areas.

.5 Carefully HEPA vacuum accessible surfaces containing or suspected of containing asbestos-contaminated dust and debris, including floors, walls, ledges, equipment, ductwork, structural members, ceiling grids and other horizontal and vertical surfaces.

.6 Following HEPA vacuuming, wet wipe accessible non-porous surfaces using clean water and suitable disposable wiping materials. Use amended water where appropriate. Avoid excessive wetting of electrical equipment, moisture-sensitive materials and other surfaces susceptible to damage.

.7 Work systematically from higher surfaces to lower surfaces and from cleaner areas toward more contaminated areas to minimize redistribution of dust and debris. Do not use compressed air, dry sweeping or other methods that may disperse asbestos fibres.

.8 Immediately collect and package contaminated wiping materials, disposable protective coverings, loose debris and other asbestos waste in suitable sealed asbestos waste containers.

.9 Repeat HEPA vacuuming and wet wiping as necessary to remove all visible dust, debris and residues from accessible surfaces. Do not disturb asbestos-containing sprayed fireproofing or other friable asbestos-containing materials during pre-cleaning.

.10 Have the completed pre-cleaning inspected by the Consultant. Correct identified deficiencies before proceeding with subsequent asbestos abatement activities or Work Area enclosure installation.

.11 Where significant accumulations of suspected asbestos-containing dust or debris, deteriorated sprayed fireproofing or other friable asbestos-containing materials are encountered, suspend the affected work and notify the Consultant. Do not disturb or remove such materials until the conditions have been assessed and appropriate asbestos procedures and control measures, including Type 3 precautions where required, have been established.

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.4 Accessing Ceiling Space with Fallen Asbestos-Containing Debris on the Surface

.1 Setup Type 2 containment per the requirements of this section (with enclosure) to remove all or part of a false ceiling to obtain access to a Work Area where asbestos-containing fire spray is present for the purposes of inspection/work (**no asbestos removal work**).

.2 Remove one ceiling tile to access the ceiling space.

.3 HEPA vacuum surface of surrounding ceiling tiles.

.4 Remove adjacent ceiling tiles for greater access.

.5 Access the ceiling space to complete inspection/work (no asbestos removal work).

.6 On completion of the inspection work, carefully replace ceiling tiles or seal off the ceiling opening with polyethylene sheeting and tape.

.7 Undertake cleaning of the enclosure per the requirements of this section.

.8 Upon approval from the Consultant, tear-down the enclosure and restore the area.

.5 Removal of Asbestos-Containing Ceiling Tiles (more than 7.5 square metres)

.1 Establish a Type 2 Asbestos Work Area with enclosure in accordance with the requirements of this Section.

.2 Carefully remove ceiling tiles individually, minimizing disturbance and fibre release. Do not break, cut, drill, abrade, grind, sand or otherwise damage the tiles during removal.

.3 Place directly into suitably sized asbestos waste containers without breaking or cutting the tiles. Seal and remove waste containers in accordance with the requirements of this Section.

.4 Where asbestos-containing ceiling tiles are inadvertently broken or damaged during removal, immediately wet the affected materials using amended water to minimize fibre release. Maintain the materials in a wet condition during handling and removal. Carefully collect all fragments and debris using HEPA-filtered vacuum equipment and wet cleaning methods, and place directly into suitable asbestos waste containers.

.5 Thoroughly HEPA vacuum and wet wipe the remaining ceiling grid, including exposed surfaces, supports, hangers and other accessible components, to remove all visible dust, debris and residues.

.6 Complete detailed cleaning of the entire Work Area, including all accessible horizontal and vertical surfaces, in accordance with the requirements of this Section.

.7 Arrange for inspection of the completed removal and cleaning by the Consultant. Correct identified deficiencies prior to proceeding.

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.8 Following acceptance by the Consultant, apply an approved lock-down agent to surfaces within the Work Area, as specified. Allow sufficient drying time before commencing enclosure teardown.

.9 Do not commence enclosure teardown until all required inspections and cleaning have been completed and written authorization to proceed has been issued by the Consultant.

.6 Asbestos Removal – Floor Mastic, Levelling Compound, Block/Concrete Wall Primers and Associated Non-Friable Materials (Mechanical Grinding with HEPA-Filtered Dust Collection)

.1 Remove all floor mastics, levelling compounds, block and concrete wall primers, adhesives and associated non-friable materials confirmed or presumed to contain asbestos within the designated Work Areas using mechanical grinding equipment equipped with HEPA-filtered dust collection devices, under Type 2 asbestos procedures in accordance with O. Reg. 278/05 and the Project Contract Documents.

.2 Establish and maintain Type 2 Asbestos Work Areas in accordance with the requirements of this Section. Do not commence grinding until required Work Area isolation, protective coverings, HVAC isolation and other asbestos precautions have been installed, inspected and accepted by the Consultant.

.3 Use mechanical grinding equipment equipped with integral or directly attached HEPA-filtered dust collection devices designed to capture dust at the point of generation. Ensure grinding equipment, shrouds, hoses, connections and filtration systems are properly maintained and operating effectively throughout the Work. Do not operate grinding equipment without functional HEPA-filtered dust collection.

.4 Use appropriate grinding equipment and methods to achieve complete removal of designated materials while minimizing unnecessary damage to the underlying substrate. Employ wet methods where practicable and compatible with the grinding equipment and dust collection system. Maintain appropriate electrical safety precautions.

.5 Provide and ensure workers wear respiratory protection in accordance with Section 13 and Table 2 of O. Reg. 278/05. Where non-friable asbestos-containing materials are disturbed using power tools equipped with HEPA-filtered dust collection, provide full-facepiece air-purifying respirators with P100 filters for dry operations, and a minimum of half-facepiece air-purifying respirators with P100 filters where materials are wetted to control fibre release. Other respiratory protection permitted by Table 2 may be used. Ensure respirators are properly fitted, maintained and used in accordance with the Regulation.

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.6 Do not use chemical solvents or solvent-based products for removal of floor mastics or levelling compounds. Prevent liquids, slurry and debris from entering floor penetrations, joints, drains or occupied spaces below.

.7 Remove all asbestos-containing materials, including residual films and deposits within cracks, pits, crevices, joints, depressions, voids and other accessible substrate irregularities. Use supplementary hand tools or other suitable equipment equipped with appropriate dust controls where mechanical grinding cannot effectively access these locations.

.8 Maintain effective dust control throughout grinding activities. Immediately suspend grinding where HEPA-filtered dust collection equipment becomes ineffective, disconnected, damaged or otherwise fails to adequately control dust generation. Correct deficiencies before resuming work.

.9 Progressively remove accumulated grinding dust, slurry and debris using HEPA-filtered vacuum equipment and/or wet cleaning methods. Do not permit excessive accumulation or redistribution of contaminated materials within the Work Area.

.10 Following grinding, thoroughly HEPA vacuum and wet clean all exposed substrates, horizontal and vertical surfaces, equipment and other accessible surfaces within the Work Area. Remove all visible dust, debris, residues and remaining asbestos-containing materials.

.11 Have the completed removal and cleaning inspected by the Consultant. Undertake additional grinding, scraping or cleaning as required to achieve satisfactory removal, at no additional cost to the Owner. Do not remove Work Area isolation or protective coverings until the Consultant has accepted completion of the removal and cleaning.

.12 Complete removal shall be determined by the absence of visible residual mastic and levelling compound on exposed substrates, including within accessible pits, cracks, crevices, voids and surface irregularities. Discoloration or staining of concrete alone shall not constitute residual material, subject to acceptance by the Consultant.

.7 <u>Disturbance of Asbestos-Containing Primer on Masonry Walls Using Power Tools (Drilling)</u>

.1 Establish a Type 2 Asbestos Work Area without enclosure, in accordance with the requirements of this Section and O. Reg. 278/05.

.2 Isolate the immediate Work Area using caution tape and asbestos warning signage. Install polyethylene drop sheets beneath and surrounding drilling locations to contain dust and debris.

.3 Provide workers with appropriate respiratory protection and disposable protective clothing in accordance with the specified Type 2 asbestos requirements.

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.4 Use drills and other power tools equipped with directly attached HEPA-filtered dust collection devices designed to capture asbestos-containing dust and debris at the point of generation. Do not use power tools without functional HEPA-filtered dust collection.

.5 Ensure HEPA-filtered dust collection equipment, including shrouds, hoses, connections and filters, is properly maintained and operated in accordance with the manufacturer's instructions. Immediately suspend work where dust collection equipment becomes ineffective or damaged.

.6 Limit drilling and disturbance of asbestos-containing primer to the minimum extent necessary to complete the required installations. Avoid unnecessary abrasion, chipping or damage to surrounding asbestos-containing materials.

.7 Immediately collect drilling dust, debris and other contaminated materials using HEPA-filtered vacuum equipment and/or wet cleaning methods. Do not use compressed air, dry sweeping or other methods that may disperse asbestos fibres.

.8 Collect and package all asbestos-containing waste, including drilling debris, contaminated disposable materials and protective clothing, in suitable, sealed and appropriately labelled asbestos waste containers. Double-bag waste in 6-mil polyethylene bags or use equivalent leak-tight packaging.

.9 Following completion of drilling, thoroughly HEPA vacuum and wet wipe affected masonry surfaces, tools, equipment, drop sheets and surrounding areas. Remove all visible dust, debris and residues.

.8 Removal of Asbestos-Containing Primer on Block / Concrete Walls and Joint-Compound Mastic Pucks (Mechanical Grinding with HEPA-Filtered Dust Collection)

.1 Establish a Type 2 Asbestos Work Area with enclosure, including required Work Area isolation, protective coverings, HVAC isolation and other asbestos precautions, in accordance with the requirements of this Section and O. Reg. 278/05. Do not commence removal until the enclosure has been inspected and accepted by the Consultant.

.2 Remove asbestos-containing primer and mastic pucks from designated masonry surfaces using grinders, shot blasters or other suitable mechanical equipment equipped with directly attached HEPA-filtered dust collection devices designed to capture dust and debris at the point of generation.

.3 Ensure all mechanical removal equipment, including shrouds, hoses, connections and HEPA filtration systems, is properly maintained and operated in accordance with the manufacturer's instructions. Do not operate equipment without functional HEPA-filtered

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dust collection. Immediately suspend work where dust collection becomes ineffective or equipment is damaged.

.4 Use appropriate equipment and removal methods to achieve complete removal of asbestos-containing primer and mastic pucks while minimizing unnecessary damage to the underlying masonry. Use supplementary hand tools or other suitable equipment with appropriate dust controls to remove residual primer from mortar joints, cracks, crevices, depressions, block surfaces and other accessible irregularities.

.5 Progressively collect grinding dust, debris and other contaminated materials using HEPA-filtered vacuum equipment and/or wet cleaning methods. Do not permit excessive accumulation or redistribution of dust and debris within the Work Area.

.6 Collect and package all asbestos-containing waste, including grinding debris, contaminated disposable materials and protective clothing, in suitable, sealed and appropriately labelled asbestos waste containers. Double-bag waste in 6-mil polyethylene bags or use equivalent leak-tight packaging.

.7 Following removal, thoroughly HEPA vacuum and wet wipe exposed masonry surfaces, equipment, protective coverings and all accessible horizontal and vertical surfaces within the Work Area. Remove all visible dust, debris and residues.

.8 Complete removal shall be determined by the absence of visible residual primer, mastic pucks and associated materials on exposed masonry surfaces. Discoloration or staining of the masonry substrate alone shall not be considered residual asbestos-containing material, provided no discernible coating, film or adhered residue remains, subject to acceptance by the Consultant.

.9 Arrange for final inspection of the completed removal and cleaning by the Consultant. Undertake additional removal or cleaning as required to achieve satisfactory completion, at no additional cost to the Owner.

.10 Following acceptance by the Consultant, apply an approved lock-down agent to surfaces within the Work Area, as specified. Allow sufficient drying time in accordance with the manufacturer's instructions before commencing enclosure teardown.

.11 Do not commence enclosure teardown until the required inspections and cleaning have been completed and written authorization to proceed has been issued by the Consultant.

.9 <u>Removal of Drywall with Asbestos Containing Joint-fill Compound (more than 1 sq. m.)</u>

.1 Undertake removal of drywall containing asbestos-containing joint-filling compound within existing Type 3 asbestos abatement Work Areas established for the removal of other asbestos-containing materials. Where drywall removal is required outside

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established Type 3 Work Areas, follow the Type 2 asbestos procedures specified herein, including the provision of a Type 2 enclosure.

.2 Establish a Type 2 Asbestos Work Area with enclosure, including required Work Area isolation, protective coverings, HVAC isolation and other asbestos precautions, in accordance with the requirements of this Section and O. Reg. 278/05. Do not commence removal until the enclosure has been inspected and accepted by the Consultant.

.3 Remove designated drywall containing asbestos-containing joint-filling compound using non-powered hand tools and controlled demolition methods to minimize dust generation and asbestos fibre release.

.4 Remove drywall in manageable sections, recognizing that breakage may occur during removal. Minimize unnecessary disturbance and fragmentation of drywall and joint-filling compound and progressively collect and dispose of resulting debris as asbestos waste.

.5 Remove baseboards, trim and other components adhered to or coated with asbestos-containing joint compound. Dispose of these materials as asbestos waste.

.6 Place removed drywall sections directly into suitably sized asbestos waste containers. Do not break or cut drywall solely to accommodate undersized waste bags or containers. Use additional protection where sharp edges or fasteners could puncture packaging.

.7 Remove wall insulation within designated demolition areas and dispose of it as asbestos waste.

.8 Remove and dispose as asbestos waste fasteners, screws, nails, drywall fragments, joint compound residues and associated debris from framing members, tracks, supports and other exposed surfaces.

.9 Inspect exposed wall and ceiling cavities, including studs, tracks, plates, blocking, penetrations and concealed ledges, for residual asbestos-containing joint compound, dust and debris. Remove all visible contamination from accessible surfaces using HEPA-filtered vacuum equipment and wet cleaning methods.

.10 Progressively collect and remove asbestos-containing waste and debris throughout demolition. Do not permit excessive accumulation or redistribution of dust and debris within the Work Area.

.11 Following removal, thoroughly HEPA vacuum and wet wipe all accessible surfaces within the Work Area, including exposed framing, wall and ceiling cavities, floors, protective coverings and adjacent surfaces. Remove all visible dust, debris and residues.

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.12 Have the completed removal and cleaning inspected by the Consultant. Undertake additional removal or cleaning as required to achieve satisfactory completion, at no additional cost to the Owner.

.13 Following acceptance by the Consultant, apply an approved lock-down agent to surfaces within the Work Area, as specified. Allow sufficient drying time in accordance with the manufacturer's instructions before commencing enclosure teardown.

.14 Do not commence enclosure teardown until the required inspections and cleaning have been completed and written authorization to proceed has been issued by the Consultant.

.10 Asbestos Removal – Sprayed Fireproofing, Residual Sprayed Fireproofing and Associated Asbestos Contamination (1 m² or Less – Type 2 Operations))

Scope and Work Classification

.1 Although sprayed fireproofing within some designated Project areas has been identified as non-asbestos-containing, residual asbestos-containing sprayed fireproofing may remain beneath or behind newer fireproofing, on structural members, and around mechanical, electrical and other building components.

.2 This section applies to the localized removal or disturbance of 1 m² or less of friable asbestos-containing sprayed fireproofing, including residual sprayed fireproofing, in accordance with O. Reg. 278/05. Determine the classification of work based on the total area worked on consecutively within a room or enclosed area, even where the work is divided into smaller operations, in accordance with Section 12(5) of the Regulation.

.3 Potential disturbance may occur during drilling, coring, cutting, and the installation, alteration or removal of anchors, hangers, threaded rods, brackets, conduits, cable trays, piping supports, duct supports, fasteners and other building components. Identify locations where residual asbestos-containing sprayed fireproofing may be disturbed before commencing these activities.

.4 Complete work using Type 2 asbestos procedures, including the use of enclosed Work Areas as specified herein, and in accordance with O. Reg. 278/05.

.5 Where the anticipated or actual disturbance exceeds 1 m², or site conditions otherwise require Type 3 operations, stop affected work, notify the Consultant and implement the applicable Type 3 procedures before proceeding. Do not divide work into smaller operations to avoid Type 3 classification.

.6 Cleaning or removal of air-handling equipment, including rigid ductwork, in a building with asbestos-containing sprayed fireproofing is classified as Type 3 work. Complete such activities under the applicable Type 3 specification. This section addresses

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localized fireproofing removal and cleaning of associated structural, architectural and non-air-handling mechanical and electrical components.

Work Area Preparation and Containment

.7 Before commencing abatement, submit a written work plan identifying the proposed Work Areas, estimated quantities of asbestos-containing sprayed fireproofing to be disturbed, removal methods, containment arrangements, HVAC isolation, worker decontamination and waste handling procedures. Submit alternative procedures for the Consultant's review before implementation.

.8 Coordinate shutdown and isolation of mechanical, electrical and other building systems affected by the work. De-energize electrical equipment where required and protect equipment and components from water, asbestos contamination and physical damage. Arrange for qualified trades to undertake system isolation or alterations where required.

.9 Complete any required cutting, capping, removal or internal cleaning of contaminated HVAC ductwork under the applicable Type 3 procedures. Ensure ductwork and other HVAC openings serving the Type 2 Work Area have been effectively isolated and sealed before commencing fireproofing removal.

.10 Construct enclosed Type 2 Work Areas using polyethylene sheeting or other suitable material impervious to asbestos. Seal enclosure perimeters, penetrations, openings and joints to prevent the migration of asbestos dust and fibres. Provide suitable access arrangements for workers and waste removal. Where opaque enclosure materials are used, provide transparent viewing panels permitting observation of the entire Work Area from outside the enclosure.

.11 Disable the mechanical ventilation system serving the Work Area and seal supply and return air openings to prevent fibre migration. Cut and cap all HVAC supply and return ductwork serving the Work Area and seal openings with polyethylene secured with adhesive tape. Maintain isolation throughout abatement and cleaning activities.

.12 Install scaffolding, platforms and other access equipment as required to safely reach all affected surfaces and building components. Protect floors and equipment using polyethylene drop sheets.

.13 Post asbestos hazard warning signs and restrict access to authorized personnel wearing appropriate protective clothing and respiratory protection. Provide facilities for workers to decontaminate protective clothing by HEPA vacuuming or damp wiping before removal, together with facilities for washing hands and face when leaving the Work Area, as required by O. Reg. 278/05.

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.14 Notify the Consultant when the Work Area, HVAC isolation, protective measures and containment are complete. Obtain acceptance of the Work Area setup before commencing asbestos disturbance or removal.

Asbestos Removal Procedures

.15 Before disturbing asbestos-containing sprayed fireproofing (including residual fireproofing suspected to be present), remove loose, fallen or previously dislodged asbestos-containing material, dust and debris from surfaces within the Work Area using HEPA-filtered vacuum equipment or damp wiping.

.16 Thoroughly wet asbestos-containing sprayed fireproofing with water containing a wetting agent using a low-pressure, fine-mist sprayer. Maintain the material in a thoroughly wetted condition throughout removal, unless wetting would create a hazard or cause damage.

.17 Remove asbestos-containing sprayed fireproofing in small, manageable sections using manual tools and methods that minimize fibre release. Collect removed material directly into suitable asbestos waste containers. Do not permit removed material or debris to fall freely onto surrounding surfaces or equipment.

.18 Remove all asbestos-containing sprayed fireproofing and residual deposits from designated removal locations, including material adhering to structural members, connection plates, fasteners, brackets, hangers, supports and other affected components. Use wet scraping, manual brushing, HEPA vacuuming and wet wiping as necessary to remove adhered residues. Maintain materials in a wetted condition during removal and cleaning.

.19 Do not use dry scraping, grinding, sanding, compressed air or other methods that generate uncontrolled dust. Where wet methods may create an electrical or other hazard, stop affected work and submit alternative dust-control and removal procedures for the Consultant's review. Confirm that the proposed methods comply with the applicable regulatory classification and worker protection requirements before proceeding.

.20 Where asbestos-containing sprayed fireproofing extends beyond the designated removal area, terminate removal at locations reviewed with the Consultant. Where required, install a suitable non-combustible barrier or approved mineral wool firestop to separate remaining asbestos-containing sprayed fireproofing from the cleared area. Maintain the required fire-resistance performance of affected building assemblies. Where specified, identify retained material using red markings and document its location for the Owner's asbestos inventory.

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Detailed Cleaning of Work Areas and Building Components

.21 Following removal of asbestos-containing sprayed fireproofing, undertake a thorough cleaning of all exposed and accessible surfaces within the designated Work Area. Cleaning must remove all visible asbestos-containing sprayed fireproofing, residual deposits, dust, debris and other asbestos contamination, including material deposited during removal activities.

.22 Clean all affected building components, including, but not limited to, the following:

Structural components: Beams, columns, joists, metal decking, beam webs and flanges, stiffeners, connection plates, bolts, welds, brackets, anchors, threaded rods, hangers and other structural attachments.

Mechanical components other than air-handling equipment: Piping, fittings, valves, pipe supports, hangers, brackets, insulation jacketing and other accessible surfaces. Address contaminated interiors of air-handling equipment and ductwork under the applicable Type 3 procedures.

Electrical components: Conduits, cable trays, raceways, junction boxes, electrical supports, brackets, threaded rods, fixtures and accessible external equipment surfaces. Use cleaning methods appropriate to the equipment and electrical hazards.

Architectural and other building surfaces: Walls, ceilings, floors, concrete surfaces, masonry, metal surfaces, penetrations, ledges, cavities and other surfaces where asbestos-containing material or debris may have accumulated.

Temporary equipment and protection: Scaffolding, platforms, ladders, tools, equipment, enclosure surfaces and other items exposed to asbestos contamination.

.23 Particular attention must be given to horizontal surfaces, ledges, recesses, joints, crevices, connection points, upper surfaces of equipment, concealed pockets and other locations where sprayed fireproofing residue and asbestos-containing dust may accumulate.

.24 Clean affected surfaces using HEPA-filtered vacuum equipment followed by wet wiping, wet brushing or other suitable methods. Remove adhered fireproofing residues by wet manual scraping or brushing, as necessary, without damaging the underlying materials or components. Repeat cleaning until all accessible surfaces are free from visible residue, dust and debris.

.25 Where electrical or other equipment cannot be safely wet cleaned, coordinate with the appropriate trade and use suitable HEPA-filtered vacuum equipment and other controlled cleaning methods. Do not introduce water into energized equipment or use cleaning procedures that could damage equipment or create an electrical hazard.

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.26 Remove and dispose of contaminated porous materials, coverings and other components that cannot be adequately cleaned, where required by the Contract Documents and permitted under the applicable asbestos work classification. Notify the Consultant where residues cannot be fully accessed or removed, or where additional removal would exceed the approved Type 2 scope.

.27 Maintain regular housekeeping throughout the work. Collect asbestos-containing debris and waste at frequent intervals and immediately upon completion of removal. Place waste, contaminated cleaning materials and disposable protective materials in dust-tight, suitable containers impervious to asbestos and clearly identified as asbestos waste. Seal containers and HEPA-vacuum or damp-wipe their exterior surfaces before removal from the Work Area. Remove waste from the workplace at regular intervals.

.28 Complete a final detailed cleaning of the entire Work Area, including all exposed structural, mechanical, electrical and architectural surfaces, equipment and enclosure surfaces. Ensure no visible asbestos-containing sprayed fireproofing, residual deposits, dust or debris remain on surfaces designated for cleaning. Do not use encapsulants or lock-down agents as substitutes for thorough cleaning and removal.

Final Inspection

.29 Allow cleaned surfaces to dry completely and notify the Consultant when the Work Area is ready for final visual inspection. Final inspections will only be conducted when surfaces are dry.

.30 The Consultant will inspect accessible surfaces within the Work Area, including structural, mechanical, electrical and other building components, to assess whether asbestos-containing sprayed fireproofing residues, dust and debris have been adequately removed. Correct deficiencies and repeat cleaning as necessary until the Work Area is accepted by the Consultant.

.31 Following satisfactory final visual inspection, apply an approved lock-down agent to designated cleaned surfaces where specified and accepted by the Consultant. Do not apply lock-down over visible asbestos-containing residue or material requiring removal.

.32 Following completion of cleaning and required inspections, dismantle the enclosure in a controlled manner. Wet and dispose of polyethylene drop sheets, enclosure materials and other disposable protection as asbestos waste. Do not reuse disposable polyethylene materials. Thoroughly clean any reusable rigid barriers, tools or equipment before removal or reuse.

.33 Leave the Work Area clean and free from visible asbestos-containing dust, debris and residual sprayed fireproofing. Restore fire protection and building systems as required by the Contract Documents. Do not re-energize affected HVAC systems until the

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necessary cleaning, isolation removal, ductwork connections and inspections have been completed and the systems are authorized for operation.

3.7 Clean-up of Asbestos Debris

.1 Follow requirements for the preparation of the Asbestos Work Area – without enclosure.

.2 Clean debris using HEPA vacuum and/or wet wiping surfaces.

.3 Debris and other residues must be disposed of as asbestos waste.

.4 Clean all tools and equipment using HEPA vacuum or wet methods.

3.8 Dismantling of the Abatement Enclosure

.1 Upon completion of asbestos abatement work and written authorization to tear down the enclosure has been provided by the Consultant, perform the following:

.1 Wet wipe or HEPA vacuum all tools and equipment prior to removal from the Asbestos Work Area.

.2 Clean all polyethylene surfaces by wet wiping or HEPA vacuuming prior to removal.

.3 Remove polyethylene wall sheets by carefully folding sheets with asbestos exposed side folded in. Dispose of as asbestos waste.

.4 Clean any debris left behind during dismantling procedures by wet wiping and/or HEPA vacuuming surfaces where the abatement enclosure once stood.

.5 Remove other materials from site.

.6 All HEPA filters taken out of service are to be disposed of as asbestos waste.

.7 Seal all inlet and exhaust openings on negative air units and vacuums when units are shut down.

.8 Re-establish items removed from the Work Area.

.9 Restore HVAC system to the Work Area including removal of capped ducts (if applicable).

.10 Vacuum Work Area and ensure the workspace is clean prior to demobilizing.

END OF SECTION

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PART 1 GENERAL

1.1 Related Work

.1 This section is to be read in conjunction with all other sections so as to comply with the General Conditions of the Project Contract.

.2 Refer to the following related sections:

.1 Section 02 82 00.01 - Type 1 Asbestos Abatement (Minimum Precautions)

.2 Section 02 82 00.02 - Type 2 Asbestos Abatement (Intermediate Precautions)

.3 Section 02 82 13.13 - Glove Bag Asbestos Abatement Operations (Type 2)

.4 Asbestos Abatement Floor Plan Drawings

1.2 Regulations

.1 Work must comply with the following regulations and guidance documents:

.1 Occupational Health and Safety Act (OHSA), R.S.O. 1990

.2 Environmental Protection Act, R.S.O. 1990

.3 Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05

.4 Designated Substances, Ontario Regulation 490/09

.5 General – Waste Management, Ontario Regulation 347/90, Environmental Protection Act

.6 Hazardous Products Act

.7 Transportation of Dangerous Goods Act

.8 Lead on Construction Projects, Ministry of Labour Guidance Document, under the OHSA

.9 Silica on Construction Projects, Ministry of Labour Guidance Document, under the OHSA

.10 EACC Lead Guideline for Construction, Renovation, Maintenance or Repair

.11 EACC Mould Abatement Guidelines

.12 Alert – Mould in Workplace Buildings, Ontario Ministry of Labour

.2 Work must comply with all applicable federal, provincial, and local requirements. In any case where a conflict arises between or among the regulations, guidance documents or with specifications provided herein, the more stringent requirements shall be followed.

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1.3 Definitions

.1 *Air Samples* - samples collected by drawing a specified volume of air through specified sample filters.

.2 *Amended Water* - water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 *Asbestos* - any of the fibrous silicates listed in O. Reg. 278/05.

.4 *Asbestos-Containing Material (ACM)* – a material that contains 0.5 per cent or more asbestos by dry weight and as identified under Existing Conditions.

.5 *Asbestos Work Area* – the area where asbestos-containing materials have been identified for removal, cleanup or that may be disturbed and to which general access is prohibited.

.6 *Asbestos Waste* – refers to asbestos-containing materials and asbestos-contaminated materials or products that have been removed from the Asbestos Work Area.

.7 *Building* - defined by the Regulation includes a structure, vault, chamber or tunnel and including (without limitation) its electrical, plumbing, heating and air handling equipment, including rigid duct work of a building or structure.

.8 *Competent Worker* - a worker who is qualified because of knowledge, training and experience to do the specific work, who is familiar with the Act and with the provisions of the Regulations that apply to the work, and who knows of all potential or actual danger to health or safety in the work.

.9 *Construction* – defined by the Act as including "erection, alteration, repair, dismantling, demolition, structural maintenance, painting, land clearing, earth moving, grading, excavating, trenching, digging, boring, drilling, blasting, or concreting, the installation of any machinery or plant, and any work or undertaking in connection with a project".

.10 *Consultant* – Owner's representative for work associated with asbestos abatement work.

.11 *Contractor* – Contractor or sub-contractor undertaking the asbestos abatement work and holding the Notice of Project.

.12 *Friable Material* – a material that when dry, can be crumbled, pulverized or powdered by hand pressure, or is crumbled, pulverized or powdered.

.13 *HEPA Filter* - a high efficiency particulate aerosol filter capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

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.14 *HEPA Integrity Test (or DOP test)* – a method to test HEPA filters installed in vacuums and negative pressure units for leaks. The testing must be completed in conformance with current industry standards of practice.

.15 *Inspector* – Owner's authorized representative (i.e. Consultant) to ensure work is undertaken in accordance with the Contract requirements.

.16 *Lock-down sealant* – compound used to "lock-down" microscopic residual asbestos fibers present after the removal of asbestos containing materials.

.17 *Negative Air* - a term used to refer to the system of air filtration used for controlling airborne asbestos at asbestos removal projects through the maintenance of lower air pressure on the inside of an enclosure than exists on the outside

.18 *Non-friable Material* - a material that cannot be crumbled, pulverized or powdered by hand pressure.

.19 *Occupied Area* – an area outside of the asbestos abatement Work Area.

.20 *Owner* - defined by the Act as including a "trustee, receiver, mortgagee in possession, tenant, lessee, or occupier of any lands or premises used or to be used as a workplace, and a person who acts for or on behalf of an owner as an agent or delegate".

.21 *PCM* – Phase Contract Microscopy

.22 *Polyethylene* - polyethylene sheeting or rip-proof polyethylene sheeting used to construct that abatement enclosure to isolate Occupied areas of the building from the asbestos Work Area or for the protection of materials.

.23 *Presumed Asbestos-Containing Materials (PACM)*: Materials assumed to contain asbestos based on their composition, age, appearance, location or other available information, but not confirmed through laboratory analysis. Such materials shall be treated as asbestos-containing unless demonstrated otherwise through appropriate sampling and analysis, in accordance with O. Reg. 278/05 and as specified herein.

.24 *Sprayer* - garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray.

.25 *Supervisor* – person in charge of the workplace or authority over a worker.

.26 Suspect Asbestos-Containing Materials (SACM): Materials potentially containing asbestos that were not identified during the assessment but may be uncovered during renovation or demolition. Such materials shall be presumed asbestos-containing unless laboratory analysis confirms otherwise.

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.27 *TEM (Transmission Electron Microscopy)* - An analytical method used to identify and quantify asbestos fibres in air or bulk material samples through high-resolution electron microscopy. TEM allows for the detection of very fine asbestos fibres and the identification of asbestos mineral types based on their physical and chemical characteristics.

.28 *Visitors* – Engineer, Contractor, Consultant or other designated representatives of the Owner and representatives of Regulatory agencies.

1.4 Existing Conditions

.1 The Asbestos Work Areas are located on the second, third and fourth floors of Carl Pollock Hall (CPH), 200 University Avenue West, Waterloo, Ontario, and comprise:

.1 *Scope 1 (Large Classroom, Base Price Scope)*: Work Areas 1.0, 1.1, 1.2, 1.3, 1.4 and 1.5

.2 *Scope 2 (Fourth-Year Design Studio, Base Price Scope)*: Work Area 2.0

.3 *Scope 3 (Faculty and Student Lounge, Base Price Scope)*: Work Area 3.0

.4 *Scope 4 (PhD Open Offices, Base Price Scope)*: Work Area 4.0

.5 *Scope 5 (Mid-Size Classroom and Study Space, Base Price Scope)*: Work Areas 5.0 and 5.1

.6 *Scope 6 (Third- and Fourth-Floor Refresh, Alternate Price Scope)*: Work Areas 6.0, 6.1 and 6.2

.2 Refer to appended Drawings Nos. 1, 2 and 3 for the approximate locations and layouts of the Work Areas.

.3 Designated Substances and Hazardous Building Materials were identified to be present within the Asbestos Work Areas. For details, refer to the following reports:

.1 “Hazardous Building Materials Assessment, Building No.: 29, 200 University Avenue West, Waterloo, Ontario” by Safetech Environmental Ltd. (SEL), dated September 26, 2016, SEL Project Number 2-111015-001

.2 “Designated Substances and Hazardous Building Materials Assessment, Final Report (Revised), Carl A. Pollock Hall, Building No. 29, 3rd and 4th Floor Refresh WR53073, 200 University Avenue West, Waterloo, Ontario”, prepared by Access Environmental Solutions (Access), dated October 30, 2026, Access File No. 10107.227

.3 University of Waterloo Asbestos Database (MS Excel Worksheet), Filename: 29-Carl A Pollock Hall June 2023

.4 The following sections summarize existing site conditions based on the findings of the above-referenced reports.

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.5 Asbestos-Containing Building Materials:

.1 sprayed fireproofing, containing 10% to 60% Chrysotile asbestos

.2 residual sprayed fireproofing, containing 2% to 20% Chrysotile asbestos

.3 sprayed fireproofing debris, containing 30% to 60% Chrysotile asbestos

.4 suspended ceiling tiles, containing 1.3% Chrysotile asbestos

.5 vinyl floor tiles, containing 1% Chrysotile asbestos

.6 mastic associated with vinyl floor tiles, containing 1% Chrysotile

.7 floor levelling compounds, containing 0.5% Chrysotile asbestos

.8 drywall joint-fill compound (walls and ceilings), containing 0.5% to 1.0% Chrysotile asbestos

.9 block wall primer, containing 0.5% Chrysotile asbestos

.10 window butyl, containing 2% Chrysotile asbestos

.11 parging cement fitting insulation, containing 60% Chrysotile asbestos

.6 Asbestos-containing sprayed fireproofing debris (friable) is present on structural components and the deck within the ceiling space in Corridor 3883. Debris observed on mechanical/ electrical equipment and the ceiling grid and metal pan system is fallen asbestos fireproofing. Entry into, or work within, these ceiling spaces should be completed using the prescribed controls under O. Reg. 278/05. Refer to Access Report #10107.227 for approximate locations of sprayed fireproofing and sprayed fireproofing debris on false ceiling.

.7 Asbestos-containing sprayed fireproofing debris (friable) is present on structural components and the deck within Mechanical Room 3983. Accumulated dust and debris observed on some mechanical and electrical equipment and other surfaces may also contain asbestos originating from the sprayed fireproofing. All work that may disturb these materials shall be undertaken using the applicable asbestos control measures prescribed under O. Reg. 278/05 and as specified herein. Refer to Access Report No. 10107.227 for the approximate locations of asbestos-containing sprayed fireproofing.

.8 As sprayed asbestos-containing fireproofing (friable) is present in the CPH building, the HVAC system internal components, including air-handling units, filters, coils/housings and rigid ductwork/plenums etc. should be presumed contaminated with asbestos fibres. Any handling, cleaning, maintenance, removal, or alteration of these components constitutes asbestos work under O. Reg. 278/05 and should follow the prescribed procedures / operations.

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.9 Given the presence of asbestos-containing sprayed fireproofing in the CPH building (with some areas since abated), it should be presumed that residual asbestos fireproofing may be concealed within wall cavities, including block wall cavities and interstitial spaces between brick and block walls.

.10 Residual sprayed fireproofing (friable) was identified sporadically concealed behind non-asbestos-containing sprayed fireproofing (SF) on metal decking, structural beams, mechanical / electrical systems etc. above suspended ceilings at various locations throughout the renovation area. Testing confirmed asbestos in some residual SF samples but not others. As these materials may be concealed and cannot be reliably identified visually, asbestos-containing residual SF should be presumed to be present beneath non-asbestos SF. Work that may disturb these materials shall follow the applicable precautions prescribed under O. Reg. 278/05 and as specified herein.

.11 Where asbestos sprayed fireproofing (SF) has been identified within the Work Areas, it shall be presumed present on, within, or concealed by the building materials and components listed below. This list is not exhaustive, and the Contractor shall independently verify existing site conditions and account for all affected materials and components.:

.1 All structural components including but not limited to open web steel joists (OWSJ), beams, columns, deck, etc.

.2 Wire mesh ceiling system (consists of decking, OWSJ with wire mesh fastened to the bottom of the OWSJ)

.3 Overspray on concrete block wall surfaces

.4 Concrete block wall cavities

.5 Overspray on conduits (all forms)

.6 Overspray on insulation (i.e. pink, yellow fibreglass, etc.)

.7 Overspray on lighting fixtures

.8 Overspray on electrical and IT components (i.e. wires, cabling, cable trays etc.)

.9 Surface of suspended ceiling grid system (i.e. ceiling tiles, grid, hangars etc.)

.10 Surface of metal panel ceiling system (i.e. metal slats, hangars etc.)

.11 Hard ceiling space (drywall, plaster etc.)

.12 Bulkheads

.13 Mechanical equipment, interior and exterior surfaces (i.e. ductwork, diffusers etc.) and associated insulation

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.14 Any and all electrical, structural, mechanical and IT components otherwise not noted above that are present within the ceiling space (including suspended grid systems, hard ceilings etc.)

.12 Asbestos-containing drywall joint-fill compound (pucks) shall be presumed present behind drywall installed over block or concrete walls. Although concealed, the Contractor shall allow for the removal of these materials in accordance with O. Reg. 278/05 and as specified herein. All associated abatement costs shall be included in the Contract Price.

.13 Presumed Asbestos-Containing Building Materials:

.1 all concealed or otherwise untested floor levelling compounds

.2 residual sprayed fireproofing in brick, block wall cavities and interstitial spaces

.3 residual sprayed fireproofing concealed behind non-asbestos sprayed fireproofing (as noted above)

.4 vinyl floor tile

.5 mastic / drywall pucks behind drywall

.6 fire doors (core inaccessible)

.7 black boards

.8 flex duct connectors

.14 The following building materials may contain asbestos but were not specifically observed but may become uncovered during renovation or demolition activities:

.1 gaskets (sheet type on flanges)

.2 concealed caulking, sealants, mastics, adhesives

.3 electrical equipment and components including cables and wiring, insulating panels and papers, arc chutes, circuit breaker linings, bushings etc.

.4 Transite® cement products such as board or pipe/conduit (concealed)

.5 concealed insulation (i.e., thermal systems insulation, thermal or fire spray insulation, insulative linings, firestop etc.) in wall and ceiling cavities, attics, crawlspaces, chimneys, inside masonry cavities, interstitial spaces between masonry walls, within any mechanical equipment, inside fire doors etc.

.15 Lead-Containing Building Materials:

.1 all paints and coatings are presumed to contain lead.

.2 batteries (i.e. emergency lighting, exit signs etc.)

.3 cable and wire sheathing

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.4 cast iron pipe gaskets and connections

.5 glazing (i.e. ceramic tiles)

.6 pipes

.7 solder used on domestic waterlines, bell fittings for cast iron pipes, electrical equipment

.8 structural steel primer

.16 Polychlorinated Biphenyl (PCB) Containing Materials

.1 fluorescent light fixture ballasts that pre-date 1981 are presumed to contain PCBs

.17 Silica-Containing Materials

.1 concrete and cement

.2 masonry and mortar

.3 ceiling tiles

.4 tiles (including clay, ceramic, concrete, etc.) and grout

.5 block walls

.6 drywall

.7 paints

.8 plaster

.18 Mercury-Containing Materials

.1 fluorescent light tubes (vapour form)

.2 electrical switches (liquid form)

.3 thermostats (liquid form)

.4 paints and adhesives (in stable form)

.19 Mould growth is suspected to be present at the following areas:

.1 water-damaged ceiling tiles (approximately 5 square feet) in Room 3603

.2 black-stained white pipe insulation (valve) in Mechanical Room 3983

.3 black-stained CWR and CWS pipe wrap (approximately 150 linear feet) in Mechanical Room 3983, the ceiling space in Corridor 3883, and the ceiling space in Room 3982

.20 Man-made Mineral Fibres (MMMF, glass wool) present in wall cavities, ceiling plenums, mechanical systems throughout the renovation Work Area.

.21 Should other designated substances or hazardous materials be uncovered, work in the area that may disturb the materials should be stopped and the Owner and the Consultant should be contacted to investigate.

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.22 Refer to the requirements of the Project Contract Documents to determine systems that are to remain active during abatement work activities.

.23 <u>The Contractor shall independently verify, quantify and confirm the extent of all designated substances and hazardous materials requiring removal under both the Base Scope of Work and Alternate Price Scope, as defined in the Project Contract Documents. Quantities provided in reference documents are for information purposes only and shall not be relied upon for pricing. All associated removal costs shall be included in the respective tender prices. No additional compensation will be permitted for discrepancies in quantities or conditions that could reasonably have been identified through review of the Contract Documents and site inspection.</u>

1.5 General Requirements

.1 Contractor to verify the scope and extent of asbestos removal/abatement work with the requirements of the Project Contract Documents.

.2 Implement all necessary measures to safely manage, handle, remove and dispose of designated substances and other hazardous building materials encountered or affected by the Work, in accordance with applicable regulations, the Project Contract Documents and as specified herein. Include all associated costs in the Contract Price.

.3 Work is to be coordinated with the Owner, Owner's representative(s), Consultant and other trades.

.4 The General Contractor shall be responsible for informing and coordinating all trades regarding the known, presumed or suspected presence and locations of asbestos-containing materials to ensure that such materials are appropriately removed, managed or protected from disturbance during the Work.

.5 Notify the Owner, Owner's representative or Consultant of asbestos-containing material discovered during work and not apparent from drawings, specifications or reports pertaining to work. Do not disturb such material pending instructions from the Consultant.

.6 Implement all necessary measures to prevent the release or migration of asbestos fibres, dust and debris beyond the designated Work Areas. Protect adjacent spaces, building systems, equipment and materials designated to remain free from asbestos contamination.

.7 Ensure all asbestos abatement activities are undertaken by appropriately trained personnel under competent supervision, using the applicable asbestos control measures prescribed under O. Reg. 278/05 and as specified herein. Implement appropriate containment, decontamination, waste handling and disposal procedures to prevent asbestos exposure and cross-contamination.

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.8 Protect existing building materials, finishes, equipment and systems designated to remain, including asbestos-containing materials not scheduled for removal. Immediately report and appropriately address any damage or unintended disturbance resulting from abatement activities.

.9 Coordinate all required inspections and clearance testing with the Consultant. Do not dismantle containments, conceal completed work or release affected areas for subsequent work until all applicable inspection and clearance requirements have been satisfactorily completed and authorization to proceed has been received.

.10 Maintain copies of all applicable designated substances and hazardous building materials assessment reports on site throughout the Work. Ensure reports are readily accessible to all personnel involved in renovation, demolition and abatement activities.

.11 Prohibit dry sweeping and the use of compressed air for cleaning potentially contaminated surfaces. Use HEPA-filtered vacuum equipment and/or wet cleaning methods, as appropriate.

.12 Ensure all personnel receive appropriate training and instruction regarding designated substances and hazardous materials that may be encountered during the Work, including asbestos, lead, silica, mercury and mould. Include associated health hazards, material recognition, safe work procedures and protective measures. Ensure personnel undertaking regulated asbestos operations have the applicable training and certification required under Ontario regulations. Maintain training records on site and make them available to the Consultant upon request.

.13 Safe work procedures satisfying the requirements of O. Reg. 278/05 should be implemented if the asbestos-containing materials and presumed asbestos-containing materials are not removed but may potentially be disturbed by any renovation, alteration, construction or demolition work.

1.6 Description of Work

.1 The intent of this Section is to identify the known, presumed or suspected presence and extent of designated substances and hazardous materials within the Work Areas and to establish requirements for the removal of asbestos-containing materials and asbestos-contaminated materials in accordance with this Section, the Project Contract Documents and all applicable regulations.

.2 Refer to Drawing Nos 1, 2 and 3 for the general layout of the asbestos Work Areas.

.3 Refer to appended Table 1 – Room-by-Room Summary for the locations of identified accessible asbestos-containing materials and associated Building Components and

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Materials (BCM) reference numbers, as documented in Access Assessment Report No. 10107.227. The Contractor shall independently verify the full scope and extent of required abatement work in accordance with the Project Contract Documents.

.4 The Contractor shall review the above-referenced reports to identify designated substances and hazardous materials within the Work Areas and account for their presence in planning and executing the work.

.5 Review the designated substances and hazardous building materials report (DSHazmat Report) in its entirety prior to commencing work. Identify designated substances and hazardous building materials that may be encountered, disturbed, damaged or otherwise affected by the Work, including materials not specifically addressed in this Section.

.6 Other designated substances and hazardous building materials may include, but are not limited to, lead, mercury, crystalline silica, polychlorinated biphenyls (PCBs), ozone-depleting substances, mould and man-made mineral fibres (MMMF), as identified in the reports.

.7 The identification of designated substances or hazardous building materials in the DSHazmat Report does not, in itself, constitute a requirement for their removal under this Section. Remove or otherwise manage such materials where specifically required by the Project Contract Documents and applicable regulations.

.8 Implement appropriate precautions and safe work procedures to prevent worker exposure, environmental contamination and the uncontrolled release of designated substances and hazardous materials during the Work, regardless of whether their removal is specifically included in this Section.

.9 Where the Work involves or may disturb other designated substances or hazardous building materials, assess the associated hazards and implement appropriate control measures, including isolation, dust suppression, ventilation, personal protective equipment, respiratory protection, decontamination and waste management, as applicable.

.10 Comply with all applicable legislation, regulations, guidelines and recognized industry standards governing the disturbance, handling, removal and disposal of designated substances and hazardous building materials.

.11 Do not disturb, remove or otherwise handle designated substances or hazardous building materials requiring specialized abatement procedures unless such work is included in the Project Contract Documents or has been reviewed and authorized by the Owner.

.12 Where previously unidentified suspect designated substances or hazardous building materials are encountered, suspend activities that may disturb the materials and notify the

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Consultant. Do not resume the affected work until the materials have been assessed and appropriate precautions or removal procedures have been established.

.13 Coordinate work involving other designated substances and hazardous building materials with asbestos abatement operations to prevent cross-contamination and maintain appropriate exposure controls throughout the Work.

.14 Collect, package, handle, transport and dispose of waste containing designated substances or hazardous materials in accordance with applicable regulatory requirements. Segregate waste streams where required and do not combine incompatible or separately regulated wastes.

.15 Review the University of Waterloo asbestos database for information regarding building materials previously identified as asbestos and non-asbestos-containing within and adjacent to the Work Area. Verify the applicability of this information to the Work Areas. Project-specific assessment findings shall take precedence over database information.

.16 The abatement of asbestos-containing materials and associated activities including bin placement, schedule and hours of work are to be coordinated with the Owner.

.17 Provide and maintain temporary hoarding, barriers, caution tape, polyethylene sheeting, signage and other necessary measures to isolate and secure asbestos abatement Work Areas, prevent unauthorized access and protect adjacent occupied areas and building activities. Ensure isolation measures are appropriate to the asbestos operation classification and maintained throughout the Work, in accordance with O. Reg. 278/05, the Project Contract Documents and as specified herein.

.18 Submit a written asbestos abatement work plan to the Consultant for review and approval prior to commencing Work. Include proposed work procedures, containment and isolation measures, negative pressure requirements and monitoring, ventilation and air filtration equipment, worker and waste decontamination facilities, waste handling and disposal procedures, and other measures necessary to safely complete the Work in accordance with O. Reg. 278/05 and as specified herein. Do not commence abatement activities until the plan has been reviewed and approved by the Consultant.

.19 Provide and maintain appropriate protective measures for all mechanical, electrical, IT and other equipment and systems designated to remain, including associated components, to prevent contamination, damage or interference during asbestos abatement activities.

.20 Prior to establishing Work Areas and installing containment systems, pre-clean affected areas to remove potentially asbestos-contaminated dust and debris using Type 2 asbestos cleanup procedures, as specified herein (no enclosure required).

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.21 Store the following items at a location suitable to the Owner that is outside of the Work Area prior to the setup of the asbestos Work Area:

.1 all non-fixed items.

.22 Implement Type 2 asbestos precautions (enclosure required), in accordance with O. Reg. 278/05, when removing or disturbing all or part of a false ceiling to access ceiling spaces where asbestos-containing material is likely to be lying on the ceiling surface, for inspection purposes only. No asbestos abatement work is permitted under this provision.

.23 Follow Type 3 measures for all alterations to any component of the building's HVAC system including ductwork in accordance with the requirements of O. Reg. 278/05. This includes areas of the building that have had fire spray abated. **Internal components of the HVAC system are considered to be contaminated with asbestos fibres**.

.24 If suspect asbestos-containing materials are uncovered during project work, work that may disturb the material should cease immediately and the UofW Project Manager contacted. Samples of the materials should be collected and tested for asbestos content. Materials confirmed to contain asbestos should be removed prior to further disturbance in accordance with O. Reg. 278/05 work procedures. Alternatively, the suspect materials can be presumed to be asbestos-containing and removed following O. Reg. 278/05 work procedures. This includes areas where sprayed fireproofing has been abated and new non-asbestos fireproofing installed as there may be residual asbestos-containing fire spray concealed beneath the new installation.

.25 If a sprayed-on friable material is uncovered and presumed to contain asbestos, the material should be treated as though it contains a type of asbestos other than Chrysotile and removed as such in accordance with O. Reg. 278/05 work procedures.

.26 Sprayed fireproofing in some Project Work Areas consists of newer non-asbestos-containing material, with older residual asbestos-containing fireproofing confirmed in certain locations and to varying extents. Due to access restrictions and concealed conditions, the precise locations and extent of residual asbestos-containing fireproofing remain uncertain.

Within existing Type 3 Work Areas established for removal of HVAC system components internally contaminated with asbestos fibres, closely inspect non-asbestos sprayed fireproofing in conjunction with the Environmental Consultant to identify and assess the presence and extent of residual asbestos-containing fireproofing.

The Contractor is responsible for identifying and documenting areas requiring fireproofing (including residual fireproofing) removal. Based on these findings and Project requirements, the Owner, in consultation with the Consultants, will determine and authorize the extent of

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newer non-asbestos-containing and residual asbestos-containing fireproofing to be removed. The Contractor is responsible for carrying out the authorized removal work.

Where residual asbestos-containing fireproofing is confirmed, carry out disturbance or removal involving 1 m² or less in accordance with Type 2 procedures otherwise Type 3 operations must be followed.

Removal of residual asbestos-containing fireproofing and reinstatement of new fireproofing will be compensated based on the applicable unit rates in the Project Contract Documents.

.27 Follow O. Reg. 278/05 Type 1 procedures (refer to the Type 1 specification) for removal of confirmed and presumed asbestos-containing vinyl floor tiles, using hand-held, non-powered tools and wet methods, in accordance with O. Reg. 278/05.

.28 Follow O. Reg. 278/05 Type 1 procedures (refer to the Type 1 specification) for removal of asbestos-containing window butyl, using wet methods and hand-held, non-powered tools, in accordance with O. Reg. 278/05.

.29 Follow O. Reg. 278/05 Type 1 procedures (refer to the Type 1 specification) for removal of presumed asbestos-containing blackboards, using wet methods and hand-held, non-powered tools.

.30 Follow O. Reg. 278/05 Type 1 procedures (refer to the Type 1 specification) for removal of confirmed or presumed asbestos-containing sheet gaskets on flanged connections, using wet methods and hand-held, non-powered tools. Alternatively, test suspect gaskets for asbestos prior to disturbance or removal.

.31 Follow O. Reg. 278/05 Type 1 procedures (refer to the Type 1 specification) for removal of less than 1 m² of drywall containing asbestos-containing joint-fill compound.

.32 Follow Type 1 procedures (refer to the Type 1 specification) for the removal of asbestos-containing ceiling tiles (less than 7.5 square metres) where asbestos-containing fire spray is NOT present.

.33 Follow O. Reg. 278/05 Type 2 procedures (refer to the Type 2 specification) for removal of 1 m² or more of drywall containing asbestos-containing joint-fill compound.

.34 Follow O. Reg. 278/05 Type 2 glove bag procedures (refer to the Glove Bag specification) for removal of asbestos-containing parging cement pipe fitting insulation, in accordance with the Project Contract Documents.

.35 Follow Type 2 procedures (refer to the Type 2 specification) for the removal of asbestos-containing ceiling tiles (more than 7.5 square metres) where asbestos-containing fire spray is NOT present on the surface of the tiles. brain

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.36 Follow O. Reg. 278/05 Type 2 procedures (refer to the Type 2 specification) for disturbance or removal of asbestos-containing sprayed fireproofing involving areas of 1 m² or less.

.37 Follow O. Reg. 278/05 Type 2 procedures (refer to the Type 2 specification) for disturbance or removal of asbestos-containing residual sprayed fireproofing involving areas of 1 m² or less.

.38 Follow O. Reg. 278/05 Type 3 procedures for disturbance or removal of asbestos-containing sprayed fireproofing involving areas exceeding 1 m².

.39 Follow O. Reg. 278/05 Type 2 procedures for disturbance or removal of asbestos-containing sprayed fireproofing involving areas less than 1 m².

.40 Classify the removal or disturbance of ceiling tiles, drywall or friable material (including asbestos-containing sprayed fireproofing and residual asbestos-containing sprayed fireproofing) based on the total cumulative area disturbed or removed consecutively within a room or enclosed Work Area, regardless of whether the work is divided into smaller, separate operations, in accordance with O. Reg. 278/05.

Where the total area of friable material is 1 m² or less, follow Type 2 procedures. Where the total area exceeds 1 m², follow Type 3 procedures. Do not subdivide work to avoid Type 3 classification. Maintain existing Type 3 controls where required for other asbestos abatement operations.

.41 Follow O. Reg. 278/05 Type 2 procedures (refer to the Type 2 specification) for pre-cleaning surfaces contaminated with asbestos-containing debris, using HEPA vacuuming and wet wiping methods, prior to commencing work in affected areas.

.42 Follow O. Reg. 278/05 Type 3 procedures, as specified herein, for cleaning, removal, alteration or modification of HVAC systems and components with presumed asbestos-contaminated interior surfaces, including air handling units, fan coil units, rigid ductwork, flexible duct connectors, diffusers, louvers, dampers, flex joints and associated components. Include cutting, dismantling, disconnection, reconnection, installation of new ductwork connections to existing systems, and other activities that may disturb asbestos contamination within existing HVAC systems.

.43 Follow O. Reg. 278/05 Type 3 procedures for alteration, cutting or removal of masonry, concrete block and brick walls, including the creation of openings, where residual asbestos-containing sprayed fireproofing or associated asbestos sprayed fireproofing debris may be concealed within wall cavities or interstitial spaces where disturbance or removal of friable asbestos-containing material exceeds 1 m². Wherever possible, incorporate such work within existing Type 3 asbestos abatement Work Areas.

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.44 Follow O. Reg. 278/05 Type 2 procedures (refer to the Type 2 specification) for mechanical removal of confirmed and presumed asbestos-containing and non-asbestos-containing vinyl floor tile mastic using power tools equipped with HEPA-filtered dust collection systems. Follow Type 3 procedures where power tools are used without HEPA-filtered dust collection systems, in accordance with O. Reg. 278/05 and as specified herein. Dispose of flooring materials with adhered asbestos-containing mastic as asbestos waste.

.45 Follow O. Reg. 278/05 Type 2 procedures (refer to the Type 2 specification) for mechanical removal of confirmed and presumed asbestos-containing floor levelling compound, including material concealed beneath flooring, using power tools equipped with HEPA-filtered dust collection systems. Follow Type 3 procedures where power tools are used without HEPA-filtered dust collection systems, in accordance with O. Reg. 278/05 and as specified herein. Dispose of flooring materials with adhered asbestos-containing levelling compound as asbestos waste.

.46 Follow O. Reg. 278/05 Type 1 procedures (refer to the Type 1 specification) for removal of presumed asbestos-containing mastic pucks concealed behind drywall on concrete walls, columns and block walls, using wet methods and hand-held, non-powered tools.

.47 Follow O. Reg. 278/05 Type 2 procedures (refer to the Type 2 specification) for mechanical removal of presumed asbestos-containing mastic pucks using power tools equipped with HEPA-filtered dust collection systems. Follow Type 3 procedures where power tools are used without HEPA-filtered dust collection systems, in accordance with O. Reg. 278/05.

.48 Follow O. Reg. 278/05 Type 2 procedures (refer to the Type 2 specification) for alteration, cutting, drilling, grinding or removal of concrete block walls coated with asbestos-containing primer, using power tools equipped with HEPA-filtered dust collection systems. Follow O. Reg. 278/05 Type 3 procedures where power tools are used without HEPA-filtered dust collection systems or where sprayed fireproofing debris is anticipated to be present within wall cavities.

.49 Perform all cutting and capping of the ductwork to isolate an asbestos abatement Work Area from adjacent areas in accordance with O. Reg. 278/05 Type 2 procedures as specified herein. Work shall include cleaning all interior surfaces of the remaining ductwork to within arms length and installing an internal duct seal at each location (for future removal).

.50 Set aside fire doors designated for removal with presumed asbestos-containing cores for assessment and testing prior to disturbance. Alternatively, remove doors intact and dispose of as asbestos-containing waste.

.51 Follow O. Reg. 278/05 requirements for the disturbance or removal of electrical equipment and associated components (including panels, wiring, Square ‘D’ panels, etc.), based on the

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condition and friability of the materials. Consult the Environmental Consultant where assessment or additional testing of any specified material is required.

.52 Stop work that may disturb previously unidentified suspect asbestos-containing materials encountered during renovation or construction activities. Arrange for sampling and laboratory analysis or presume such materials to be asbestos containing. Remove or otherwise manage confirmed or presumed asbestos-containing materials in accordance with O. Reg. 278/05 and as specified herein before resuming affected work. Where sprayed-on friable materials are presumed asbestos-containing without testing, treat them as containing a type of asbestos other than chrysotile, in accordance with O. Reg. 278/05.

.53 Isolate the asbestos Work Area following O. Reg. 278/05 Type 2 and Type 3 procedures for the setup of the enclosures.

.54 Install upper seals consisting of poly sheeting secured with adhesive tape and glue at the perimeter of the Type 2 and Type 3 abatement Work Areas to fully isolate the space from adjacent areas of the building.

.55 Shut down the HVAC system serving all areas where Type 2 and Type 3 work is to be performed.

.56 Cut and hard-cap all supply and return air vents serving areas where Type 2 and Type 3 work is to be performed.

Floor Levelling Compounds

.57 Floor levelling compound is known or expected to be present within the designated Work Areas. Not all levelling compounds have been sampled or analyzed for asbestos content. For the purposes of this Contract, presume that all floor levelling compounds contain asbestos, regardless of appearance, colour, thickness, location, installation date or whether individual materials have been sampled.

.58 Remove all floor levelling compound within the designated Work Areas, including materials applied directly to concrete substrates, materials concealed beneath existing floor finishes, adhesives or other building materials, and residual levelling compound remaining following removal of overlying materials.

.59 Anticipate that levelling compound may be present in multiple layers, of varying thicknesses, and may be irregularly distributed throughout the Work Areas. Materials may be present as continuous applications, isolated patches, feathered edges, thin coatings, localized repairs, or deposits within surface irregularities.

.60 Include the complete removal of levelling compound from all accessible substrate surfaces, including, but not limited to, the following:

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(a) Floor surfaces and exposed concrete substrates.

(b) Expansion joints.

(b) Depressions, pits, holes, cracks, joints, grooves, crevices and other surface irregularities.

(c) Voids, recesses, openings and penetrations, including those surrounding pipes, conduits, floor drains and other building components.

(d) Perimeters of rooms, wall-to-floor intersections, corners, thresholds, door openings and transitions between floor elevations.

(e) Areas beneath, adjacent to or surrounding equipment bases, supports, partitions and other obstructions, where accessible within the designated scope of work.

(f) Areas where levelling compound has penetrated or become embedded within the pores, surface imperfections or irregularities of the underlying substrate.

.61 Remove all visible levelling compound, including residual films, patches, fragments and deposits adhering to or embedded within the accessible substrate. Use appropriate removal equipment and methods to achieve complete removal, including localized hand tools and other suitable equipment necessary to access cracks, pits, joints, crevices and irregular surfaces.

.62 Do not consider the removal complete where visible levelling compound remains within accessible depressions, cracks, pits, crevices, voids or other substrate irregularities. Removal of the general surface layer alone does not constitute satisfactory completion of the Work.

.63 Anticipate that removal may require additional localized scraping, grinding, chipping, brushing or other suitable methods to remove residual materials from irregular or deteriorated substrates. Undertake all removal using the specified asbestos precautions and appropriate dust-control measures.

.64 Exercise care to avoid unnecessary damage to the underlying substrate while achieving complete removal of levelling compound. Where removal cannot be effectively completed without significant substrate damage or disturbance of structural components, notify the Consultant before proceeding. Do not leave residual materials in place without written authorization from the Consultant.

.65 Include all labour, equipment, tools, consumables, access requirements, asbestos precautions, waste handling, cleaning and repeated removal efforts necessary to achieve the specified standard of completion.

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.66 Allow for all variations in the distribution, thickness, quantity, adhesion and condition of levelling compound throughout the designated Work Areas, including materials concealed beneath floor finishes and deposits within pits, cracks, crevices, voids and other substrate irregularities. Such conditions are to be anticipated and included in the Contract Price.

.67 No additional compensation or change orders will be permitted for the discovery or removal of additional levelling compound within the designated Work Areas, including previously unidentified layers, localized deposits, unusually thick applications, strongly adhered materials, or materials requiring additional labour, equipment or repeated removal efforts. All such work shall be considered included in the original scope and Contract Price.

.68 Have all surfaces inspected by the Consultant following removal and final cleaning. Complete any additional removal and cleaning required to achieve the specified standard of completion, at no additional cost to the Owner.

.69 Refer to the Project Contract Documents for the full scope and extent of asbestos-containing materials (ACMs) requiring removal within each Work Area, including the applicable Base Scope and Alternate Price Scope.

The following sections provide general guidance and recommended abatement procedures by Work Area based on project-specific conditions and requirements. The Project Contract Documents shall govern the final scope and extent of required removal. Refer to the appended drawings for the locations of Work Areas.

.70 Work Areas 1.0, 2.0, 3.0, 4.0 and 5.0

.1 Follow O. Reg. 278/05 Type 3 procedures, for the removal of mechanical equipment and associated components with presumed asbestos-contaminated interior surfaces, flooring materials and underlying asbestos-containing levelling compounds, floor mastics, suspended ceiling systems, drywall containing asbestos-containing joint-fill compound, concealed asbestos-containing drywall mastic pucks where encountered, and the alteration or removal of concrete block walls, including the creation of new openings. Include associated asbestos-containing materials, overspray, residue and debris encountered during these activities. Complete all required removal and cleaning within the designated Type 3 Work Areas in accordance with the scope of work specified in the Project Contract Documents.

.2 As noted above, assess areas containing newer non-asbestos-containing sprayed fireproofing for the presence of residual asbestos-containing fireproofing. Where removal or disturbance is required, follow Type 2 procedures for quantities of 1 m² or less and Type 3 procedures for quantities exceeding 1 m², in accordance with O. Reg. 278/05. Determine the applicable classification based on the total area disturbed or

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removed consecutively within a room or enclosed area, including work divided into smaller operations, as prescribed by Section 12(5). Maintain existing Type 3 controls where required for other abatement activities.

.71 Work Area 1.1

.1 Follow O. Reg. 278/05 Type 2 asbestos abatement procedures in conjunction with Environmental Abatement Council of Canada (EACC) Level 2 mould remediation procedures for the removal of asbestos-containing ceiling tiles and mould-impacted, non-asbestos-containing pipe insulation, to the extent necessary to facilitate the removal of chilled water return (CWR) and chilled water supply (CWS) lines, in accordance with the Project Contract Documents and as specified herein.

.2 As noted above, assess areas containing newer non-asbestos-containing sprayed fireproofing for the presence of residual asbestos-containing fireproofing. Where removal or disturbance is required, follow Type 2 procedures for quantities of 1 m² or less and Type 3 procedures for quantities exceeding 1 m², in accordance with O. Reg. 278/05. Determine the applicable classification based on the total area disturbed or removed consecutively within a room or enclosed area, including work divided into smaller operations, as prescribed by Section 12(5).

.72 Work Area 1.2

.1 Follow O. Reg. 278/05 Type 2 asbestos abatement procedures in conjunction with Environmental Abatement Council of Canada (EACC) Level 2 mould remediation procedures for the removal of suspended ceiling tiles contaminated with fallen friable asbestos-containing sprayed fireproofing and mould-impacted, non-asbestos-containing pipe insulation, to the extent required to facilitate removal and replacement of chilled water return (CWR) and chilled water supply (CWS) lines. Where disturbance or removal of asbestos-containing sprayed fireproofing on concrete block walls or other surfaces is required to accommodate removal, installation or reinstatement of piping and associated components, limit the total area of friable material disturbed or removed to 1 m² or less under Type 2 procedures. Follow Type 3 procedures where the area exceeds 1 m², in accordance with O. Reg. 278/05, the Project Contract Documents and as specified herein.

.73 Work Area 1.3

.1 *Pre-Cleaning*: Prior to establishing containment, pre-clean affected surfaces of mechanical and electrical equipment, piping, structural components and other surfaces where fallen asbestos-containing sprayed fireproofing debris may be present. Follow O.

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Reg. 278/05 Type 2 procedures using HEPA vacuuming and wet wiping methods, as specified herein.

.2 *Containment and Isolation*: Establish and maintain a Type 2 asbestos containment enclosure encompassing the existing CWR and CWS piping and associated Work Areas. Provide polyethylene barriers, appropriate isolation, decontamination facilities and other protective measures necessary to prevent asbestos contamination of adjacent areas throughout removal and replacement activities.

.3 *Removal of Existing Piping*: Follow O. Reg. 278/05 Type 2 asbestos precautions in conjunction with Environmental Abatement Council of Canada (EACC) Level 2 mould remediation procedures for the removal of existing CWR and CWS piping and associated mould-impacted, non-asbestos-containing insulation. Implement procedures appropriate to both asbestos and mould hazards.

.4 *Asbestos-Containing Pipe Fittings*: Follow O. Reg. 278/05 Type 2 glove bag procedures for removal of asbestos-containing parging cement pipe fitting insulation. Where glove bag procedures are unsuitable, follow the applicable Type 2 procedures (< 1 sm) otherwise Type 3 procedures apply.

.5 *Protection of Sprayed Fireproofing*: Minimize movement, vibration and disturbance of piping, hangers, supports, structural components and other materials that may dislodge asbestos-containing sprayed fireproofing from overhead surfaces. Implement appropriate work methods and protective measures to prevent the release and spread of asbestos fibres and debris throughout removal and installation activities.

.6 *Disturbance of Sprayed Fireproofing*: Follow O. Reg. 278/05 Type 2 procedures where removal or disturbance of asbestos-containing sprayed fireproofing is required to accommodate piping removal, installation or reinstatement, provided the total area of friable material disturbed or removed does not exceed 1 m², otherwise Type 3 operations and procedures apply.

.7 *Installation of Replacement Piping*: Maintain asbestos containment and protective measures during installation of replacement CWR and CWS piping, including installation and adjustment of hangers, supports, anchors and associated components. Undertake installation within the established Type 2 enclosure using personnel appropriately trained and equipped to work in asbestos-regulated areas. Coordinate installation activities between the asbestos abatement and mechanical contractors.

.8 *Containment Maintenance*: Maintain the enclosure and appropriate asbestos precautions throughout piping removal and replacement activities. Do not dismantle or modify containment until all work with the potential to disturb asbestos-containing

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sprayed fireproofing has been completed and required inspections have been satisfactorily completed.

.9 *Final Cleaning and Inspection*: Upon completion of removal and installation activities, thoroughly clean the Work Area, including piping, equipment, structural components and other affected surfaces, using HEPA vacuuming and wet wiping methods. Inspect and clean accessible exterior surfaces of containment barriers where asbestos-containing dust or debris may have accumulated. Arrange for inspection by the Consultant prior to dismantling containment.

.10 *Containment Removal*: Remove containment only after authorization has been received from the Consultant. Take appropriate precautions during dismantling to prevent the release or migration of asbestos-containing dust and debris into adjacent areas.

.74 Work Area 1.4

.1 Follow O. Reg. 278/05 Type 2 procedures for removal of 7.5 m² or more of asbestos-containing suspended ceiling tiles.

.2 As noted above, assess areas containing newer non-asbestos-containing sprayed fireproofing for the presence of residual asbestos-containing fireproofing. Where removal or disturbance is required, follow Type 2 procedures for quantities of 1 m² or less and Type 3 procedures for quantities exceeding 1 m², in accordance with O. Reg. 278/05. Determine the applicable classification based on the total area disturbed or removed consecutively within a room or enclosed area, including work divided into smaller operations, as prescribed by Section 12(5).

.75 Work Area 1.5 (Second Floor)

.1 Assess areas containing newer non-asbestos-containing sprayed fireproofing for the presence of residual asbestos-containing fireproofing. Where removal or disturbance is required for the installation of conduits and other related equipment, follow Type 2 procedures for quantities of 1 m² or less of residual asbestos fireproofing and Type 3 procedures for quantities exceeding 1 m², in accordance with O. Reg. 278/05. Determine the applicable classification based on the total area disturbed or removed consecutively within a room or enclosed area, including work divided into smaller operations, as prescribed by Section 12(5).

.76 Work Area 5.1

.1 Follow O. Reg. 278/05 Type 2 procedures for removal of 7.5 m² or more of asbestos-containing suspended ceiling tiles, including tiles contaminated with fallen asbestos-containing sprayed fireproofing (portion of Corridor 4316A). Prior to removal, carefully

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clean accumulated fireproofing debris from the upper surfaces of affected tiles using HEPA vacuuming and wet wiping methods, as appropriate, to minimize disturbance and prevent the release of asbestos fibres.

.2 Based on Project Contract Document requirements, follow O. Reg. 278/05 Type 2 procedures for disturbance or removal of 1 m² or less of friable asbestos-containing sprayed fireproofing within Corridor 4316A. Follow Type 3 procedures where the cumulative area of disturbance or removal exceeds 1 m² within the same room or enclosed area.

.77 Work Areas 6.0, 6.1 and 6.2 (Alternate Price Scope)

.1 Follow O. Reg. 278/05 Type 1 procedures for removal of asbestos-containing vinyl floor tiles using wet methods and hand-held, non-powered tools, in accordance with the Project Contract Documents.

.2 Follow O. Reg. 278/05 Type 2 procedures for removal of 7.5 m² or more of asbestos-containing suspended ceiling tiles, including tiles contaminated with fallen asbestos-containing sprayed fireproofing (portion of Corridor 3883 adjacent to Mechanical Room 3983). Prior to removal, carefully clean accumulated fireproofing debris from the upper surfaces of affected tiles using HEPA vacuuming and wet wiping methods, as appropriate, to minimize disturbance and prevent the release of asbestos fibres.

.3 Following ceiling tile removal, thoroughly HEPA vacuum and wet wipe suspended ceiling grids, hangers and associated components designated to remain. Exercise care to avoid disturbing asbestos-containing sprayed fireproofing above the ceiling system.

.4 Coordinate the installation of replacement ceiling tiles with the General Contractor to minimize the duration that ceiling spaces (and thus asbestos sprayed fireproofing) remain exposed. Reinstate suspended ceilings as soon as practicable following completion of abatement and required inspections. Do not leave ceiling spaces containing asbestos-containing sprayed fireproofing exposed to occupied or uncontrolled areas. Maintain appropriate temporary containment and isolation measures until ceiling systems are reinstated.

.5 Follow O. Reg. 278/05 Type 2 procedures for mechanical removal of asbestos-containing or presumed asbestos-containing floor levelling compounds and floor mastic, including materials concealed beneath existing flooring, using power tools equipped with HEPA-filtered dust collection systems. Follow Type 3 procedures where power tools are used without HEPA-filtered dust collection systems, as specified herein.

.6 Based on Project Contract Document requirements, follow O. Reg. 278/05 Type 2 procedures for disturbance or removal of 1 m² or less of friable asbestos-containing

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sprayed fireproofing within Corridor 4316A. Follow Type 3 procedures where the cumulative area of disturbance or removal exceeds 1 m² within the same room or enclosed area.

.7 Protect existing metal pan ceiling systems designated to remain in Work Area 6.1 (Corridor 3883). Do not disturb, remove or modify these systems.

.8 Based on Project Contract Document requirements, follow O. Reg. 278/05 Type 2 procedures for disturbance or removal of 1 m² or less of friable asbestos-containing sprayed fireproofing within Corridor 4316A. Follow Type 3 procedures where the cumulative area of disturbance or removal exceeds 1 m² within the same room or enclosed area.

.78 All Work Areas

.1 Follow O. Reg. 278/05 Type 2 procedures for alteration, breaking, cutting, drilling, abrading, grinding, sanding, vibrating or removal of masonry, concrete block and brick walls coated with asbestos-containing primer, using power tools equipped with HEPA-filtered dust collection systems, as specified herein. Wherever practicable, incorporate such activities within existing Type 3 asbestos abatement Work Areas.

.2 Follow O. Reg. 278/05 Type 2 procedures for disturbance or removal of 1 m² or less of concealed friable asbestos-containing sprayed fireproofing within wall cavities, interstitial spaces or behind building materials. Follow Type 3 procedures where the cumulative area of disturbance or removal exceeds 1 m² within the same room or enclosed area. Wherever practicable, incorporate such work within existing Type 3 asbestos abatement Work Areas, as specified herein.

.3 Follow O. Reg. 278/05 Type 3 procedures for cutting, disconnecting, capping and removal of existing ductwork with presumed asbestos-contaminated interior surfaces, as required by the Project Contract Documents and as specified herein. Include isolation of HVAC systems, appropriate containment, HEPA vacuuming and wet wiping of affected surfaces, and sealing of duct openings to prevent the release or migration of asbestos fibres.

.4 Follow safe work procedures based on O. Reg. 278 Type 2 and Type 3 procedures for connections of new ductwork to existing ducts with presumed asbestos-contaminated interior surfaces, as specified herein. Include cutting, opening, cleaning and preparation of existing ductwork at connection points, using appropriate asbestos control measures such as installed poly barriers. Clean and seal affected surfaces and complete connections in a manner that prevents the release or migration of asbestos fibres into occupied areas or the HVAC system.

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.79 As Type 3 operations for the abatement of asbestos-containing fire spray are based on wet removal methods, if dry removal methods are required, the Contractor is to submit an abatement plan for review by the Consultant that includes greater worker protection levels in accordance with the requirements of O. Reg. 278/05.

.80 Prior to the start of contaminated work, the Contractor is to notify the Consultant that a pre-inspection of the Work Area is required. Minimum 48 hours notice is required.

.81 Prior to completion of abatement activities, the Contractor is to notify the Consultant that a final inspection of the Work Area is required. Minimum 48 hours notice is required.

.82 Do not dismantle or remove Type 2 or Type 3 containment enclosures until the Consultant has completed a satisfactory visual inspection confirming completion of the specified abatement work and that all surfaces are free of visible dust, debris and residual asbestos-containing materials designated for removal. Obtain written authorization from the Consultant prior to dismantling containment.

.83 Do not dismantle or remove Type 3 containment enclosures until the Consultant has completed a satisfactory visual inspection confirming completion of the specified abatement work and that all surfaces are free of visible dust, debris and residual asbestos-containing materials designated for removal. Following satisfactory visual inspection, clearance air testing shall be undertaken and results must meet the specified acceptance criteria. Obtain written authorization from the Consultant prior to dismantling containment.

.84 Do not use chemical solvents or solvent-based removal methods for floor mastics within any Work Area. Such products may penetrate floor assemblies, seep or leak into occupied spaces below, and result in chemical exposure, odours, contamination, staining or damage to building materials, finishes and equipment. Use approved mechanical removal methods with appropriate dust control measures, in accordance with O. Reg. 278/05 and as specified herein.

.85 Upon completion of the Work and prior to demobilization, thoroughly clean all Work Areas using wet wiping, wet mopping and/or HEPA vacuuming, as appropriate, to remove residual dust and debris.

.86 The Contractor shall make good on any damage caused to the Owner’s property as a result of activities by the Contractor.

.87 <u>Maintain an on-site daily log identifying all personnel performing asbestos abatement work, including their names and dates worked. Make the log available to the Consultant upon request for verification of applicable training requirements.</u>

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Lead

.88 Undertake work involving the disturbance, removal or handling of lead-containing or presumed lead-containing materials in accordance with the Project Contract Documents, applicable regulatory requirements and the following guidelines:

(a) Lead on Construction Projects, Ontario Ministry of Labour, Immigration, Training and Skills Development (online guideline, updated November 30, 2022).

(b) Lead Guideline for Construction, Renovation, Maintenance or Repair, Environmental Abatement Council of Canada (EACC), October 2014.

.89 Implement appropriate lead exposure controls during scraping, sanding, grinding, cutting, drilling, demolition and other activities that may generate lead-containing dust, fumes or debris. Provide engineering controls, including wet methods, local exhaust ventilation and HEPA-filtered dust collection, as appropriate. Implement work area isolation, respiratory protection, protective clothing, housekeeping, hygiene measures and exposure monitoring based on the nature of the work and potential for lead exposure.

.90 Collect, handle, characterize and dispose of lead-containing coatings, debris and other waste in accordance with applicable regulatory requirements, including O. Reg. 347/90. Undertake leachability testing or other waste characterization, where necessary, to determine appropriate waste classification and disposal requirements.

Silica

.91 Undertake work involving the disturbance of crystalline silica-containing materials in accordance with the Project Contract Documents, applicable regulatory requirements and the Ontario Ministry of Labour, Immigration, Training and Skills Development's online guideline, Silica on Construction Projects (updated November 10, 2022).

.92 Implement appropriate silica exposure controls during drilling, cutting, grinding, chipping, coring, demolition and other dust-generating activities. Provide engineering controls, including wet methods, local exhaust ventilation and HEPA-filtered dust collection, as appropriate. Implement respiratory protection, work area isolation, housekeeping, hygiene measures and exposure monitoring based on the nature of the work and potential for exposure to respirable crystalline silica.

Mercury

.93 Protect mercury-containing equipment and components from damage during construction and demolition activities. Where removal is required, carefully remove mercury-containing components intact, where practicable, to prevent breakage and release of mercury.

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.94 Collect, package, handle and dispose of mercury-containing equipment and waste in accordance with applicable regulatory requirements, including O. Reg. 347/90. Use approved recycling facilities where appropriate.

Ozone Depleting Substances (ODS)

.95 No equipment containing ozone-depleting substances was identified in the DSHazmat Report. Where previously unidentified equipment containing refrigerants or other regulated halocarbons is encountered, do not damage, dismantle or dispose of the equipment until appropriate recovery and management procedures have been established in accordance with applicable regulations.

Polychlorinated Biphenyls (PCB)

.96 Prior to removal or disposal of existing fluorescent light fixtures, inspect and identify associated electrical ballasts for the potential presence of PCBs using manufacturer information, date codes, labelling and other recognized identification methods.

.97 Treat ballasts manufactured before 1981, or those of unknown manufacture date without reliable evidence of being PCB-free, as potentially PCB-containing unless otherwise confirmed.

.98 Remove, handle, package, store and dispose of confirmed or presumed PCB-containing ballasts in accordance with applicable federal and provincial regulations, including the federal PCB Regulations (SOR/2008-273). Segregate PCB-containing components from general demolition waste and materials designated for recycling

1.7 Schedule

.1 Work in collaboration with the Owner, Consultant and other stakeholders to schedule the work to minimize disturbance to building occupants.

.2 Provide a schedule for the abatement work that is in accordance with the following project limitations:

.1 Start of project (i.e. Contractor mobilization):

.2 Completion of the project (i.e. Contractor demobilization):

.3 All work is to be completed during regular hours. Obtain approval from the Owner for work outside of regular hours.

1.8 Submittals

.1 *General* - prior to the start of work, submit the following to the Consultant:

.1 Schedule.

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.2 Insurance certificates including Asbestos Liability Insurance.

.3 WSIB Clearance Certificate.

.4 Company Health and Safety Policy.

.5 Notice of Project (NOP) form.

.6 Pre-abatement survey of each Work Area for pre-existing damage, including photographic records.

.7 Submit a written asbestos abatement work plan, including drawings or sketches, to the Consultant for review and written approval before establishing Work Areas or commencing abatement. Include proposed work procedures, sequencing and phasing; enclosure layouts and isolation measures; negative air unit locations, capacities and exhaust points; worker and waste decontamination facilities; access points; negative pressure monitoring; coordination with other trades; and inspection and clearance procedures. Do not commence Work until written approval is received.

.2 *Safety* - prior to the start of work, submit the following to the Consultant:

.1 HEPA Filter Integrity (or DOP) test results for all vacuums used on site. Results must be no more than three months old.

.2 HEPA Filter Integrity (or DOP) test results from an independent testing company for all negative air units used on site. Results must be no more than three months old if vented outdoors and performed on site prior to use if vented indoors and when filters are changed. DOP testing of negative air units, vacuums and any other HEPA filtered equipment must be undertaken in accordance with the Environmental Abatement Council of Canada (EACC) document, “DOP/PAO Testing Guideline”, 2013, or a similar standard.

.3 Records of DOP test equipment calibration.

.4 Written acknowledgement that Ground Fault Interrupter Circuits are setup in accordance with applicable CSA Standard and inspected by the Electrical Safety Authority.

.5 Written proof that scaffolding has been inspected and passed the inspection, in accordance with OHSA and all other applicable regulatory requirements.

.6 Material Safety Data Sheets for all chemicals used on site.

.7 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets for chemicals or materials including:

.1 encapsulant

.2 amended water

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.3 slow-drying sealer / lock-down sealant

.3 *Training* - prior to the start of work, submit the following to the Consultant:

.1 WHMIS training certificates for all personnel.

.2 Submit documentation confirming that all personnel entering Asbestos Work Areas have received appropriate asbestos hazard awareness, safe work procedure, respiratory protection, protective clothing, decontamination and equipment-specific training, as applicable, in accordance with O. Reg. 278/05.

.3 Submit proof of successful completion of the Ontario-approved Asbestos Abatement Supervisor Training Program (Trade Code 253S) for all personnel supervising Type 3 asbestos operations, in accordance with O. Reg. 278/05.

.4 Submit proof of successful completion of the Ontario-approved Asbestos Abatement Worker Training Program (Trade Code 253W) for all workers performing Type 3 asbestos operations, including applicable trades, in accordance with O. Reg. 278/05.

.5 Submit valid Working at Heights training certificates for all personnel required to use fall protection systems, issued through a training program and provider approved by Ontario's Chief Prevention Officer, in accordance with O. Reg. 297/13 and O. Reg. 213/91. Include proof of refresher training where applicable.

.6 Submit all training and certification documentation to the Consultant for review prior to commencement of applicable Work. Maintain current records on site and provide updated documentation for replacement or additional personnel before they commence Work.

.7 Resumes of supervisory personnel.

.8 Fit test certificates for all workers donning respirators.

.4 *Waste Management* - prior to the start of work, submit the following to the Consultant:

.1 Proof that suitable arrangements have been made to dispose of asbestos-containing waste and location of landfill.

.2 Permits for transportation.

.3 On completion of the project, proof in the form of manifests, weigh scale receipts, bills of lading from the disposal facility that asbestos-containing waste has been received and properly disposed of.

1.9 Instruction and Training

.1 Provide instruction and training to all workers on the hazards of asbestos exposure, personal hygiene and work practices, entry and exit from Type 3 Work Areas and in the use, cleaning, and disposal of respirators and protective clothing.

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.2 Instruction and training related to respirators includes, at a minimum:

.1 Fitting of equipment

.2 Inspection and maintenance of equipment

.3 Disinfecting of equipment

.4 Limitations of equipment

.3 Type 3 procedures including details of the specified work of this section.

.4 Operational procedures including:

.1 Preparation of the Work Area

.2 Dust control

.3 Personal protective clothing and equipment

.4 Clean-up of the Work Area and waste removal

.5 First Aid training in accordance with the OHSA.

.6 Instruction and training must be provided by a competent, qualified person.

1.10 Worker Protection

.1 Only persons wearing protective clothing and equipment (i.e. respirators) may enter a Work Area where there is an asbestos dust hazard.

.2 Requirements for the use of protective clothing are as follows:

.1 Be made of a material that does not readily retain or permit penetration of asbestos fibres.

.2 Consist of head covering and full body covering that fits snugly at the ankles, wrists and neck to prevent asbestos fibres from reaching the garments and skin under the protective clothing.

.3 Must include suitable footwear.

.4 Must be repaired or replaced if torn.

.5 Must be decontaminated by damp wiping or HEPA vacuuming before leaving the Work Area

.3 Requirements for the use of respirators are as follows:

.1 Provide and require all personnel entering asbestos abatement Work Areas to use appropriate respiratory protection in accordance with Section 13 and Table 2 of O. Reg. 278/05 and as specified herein. Ensure respirators are properly selected, fit-tested, maintained and used in accordance with applicable regulatory requirements.

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.2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters should be worn by workers during the teardown of Type 3 enclosure following Type 2 precautions.

.3 Written procedures must be in place for the selection, care and use of respirators. A copy of the procedures must be given to and reviewed with each worker who is required to wear a respirator.

.4 A worker must not be assigned to do work requiring the use of a respirator unless the worker is physically able to do the work while wearing the respirator.

.5 Respirators must be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is a hood or helmet type.

.6 Respirators must be assigned to a worker for his or her exclusive use, if practical.

.7 Respirators must be used and maintained in accordance with written procedures that are consistent with the manufacturer's specifications.

.8 Replace filters as necessary in accordance with manufacturer’s instructions.

.9 Respirators that are assigned to one worker must be cleaned, disinfected and inspected at least after use on each shift.

.10 Respirators that are used by more than one worker must be cleaned, disinfected and inspected after each use.

.11 Damaged or deteriorated respirator parts must be replaced before the respirator is used by a worker.

.12 Respirators must be stored in a convenient, clean and sanitary location when not in use.

.13 Workers must receive training in the use, cleaning and disposal of respirators and protective clothing.

.14 The respirator training must include the limitations of the equipment, inspection and maintenance, proper fitting and cleaning and disinfection.

.15 All workers donning a respirator must be fit tested for that respirator. Fit testing must be provided by a competent person.

.4 Requirements for other personal protective equipment are as follows:

.1 Hard hats, safety shoes, safety glasses and protective gloves should be worn by workers in accordance with construction safety regulations.

.5 Other safety measures to be followed include:

.1 Eating, drinking, chewing or smoking must not be permitted in the Work Area.

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.2 Workers must dispose of protective clothing as contaminated waste before leaving the Asbestos Work Area.

.3 Ensure workers are provided with soap, shampoo, towels and warm water when leaving the Asbestos Work Area.

1.11 Type 3 Entry into Asbestos Work Area Procedures

.1 The following steps must be followed when entering the Asbestos Work Area:

.1 Remove street clothing in clean changeroom (i.e., clean decontamination chamber)

.2 Don respirator, clean coveralls and head covers

.3 All street clothing (including footwear), towels and other personal articles are to remain in the clean changeroom.

1.12 Type 3 Exit from Asbestos Work Area Procedures

.1 The following steps must be followed when leaving the Asbestos Work Area:

.1 Remove gross contamination from protective clothing before leaving Work Area by HEPA vacuuming surfaces.

.2 Proceed to Equipment and Access Room (i.e., dirty decontamination chamber) and remove all clothing except respirators.

.3 Place contaminated work suits in receptacles for disposal with other asbestos-contaminated materials.

.4 Store reusable items except respirator in Equipment and Access Room.

.5 While wearing the respirator, proceed naked to the showers.

.6 Using soap and water wash body and hair thoroughly and clean outside of respirator with soap and water while showering.

.7 Remove and protect respirator filters or dispose with other contaminated materials.

.8 Wash and rinse the inside of the respirator.

.9 Thoroughly clean footwear inside and out using soap and water before removing from Work Area or from Equipment and Access Room.

.10 After showering and drying off, proceed to clean change room and dress in street clothes.

1.13 Visitor Protection

.1 Prior to entry into the Asbestos Work Area, authorized visitors with the following:

.1 New protective clothing and new approved respirators prior to entry into the Asbestos Work Area.

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.2 Instruction in asbestos hazards, required protective measures, work area restrictions, emergency procedures, and proper use of protective clothing and respiratory protection.

.3 Training in the use of protective clothing, respirators, and procedures including entering and exiting the Asbestos Work Area.

.4 Instruction in the proper procedures to be followed when entering into and exiting from the Asbestos Work Area.

.5 Ensure visitors are accompanied by an authorized representative of the Asbestos Abatement Contractor and comply with all applicable work area safety and decontamination requirements. Do not permit visitors to undertake asbestos abatement activities.

1.14 Supervision

.1 Provide, at minimum, one Supervisor for every ten (10) workers for pre-cleaning the Work Area, set-up of the Work Area, removal and/or repair work.

.2 Ensure approved Supervisor or Supervisors remain within the Asbestos Work Area at all times during the disturbance, removal, or other handling of asbestos-containing materials. Failure to meet this requirement may result in stoppage of work at no cost to the Owner or Consultant.

.3 Obtain written approval from the Consultant for the replacement of Supervisory personnel.

1.15 Notification

.1 Inform all sub-trades of the presence of asbestos-containing materials as identified herein.

.2 Submit to the Owner and Consultant a copy of all notifications prior to the start of work.

.3 Notify disposal site in advance of delivery of asbestos waste in accordance with the requirements of the Waste Management Regulation (O. Reg. 347/90).

.4 Prior to starting a Type 3 operation notify orally and in writing, an inspector at the office of the Ministry of Labour as prescribed in O. Reg. 278/05.

.5 Notify the Consultant, Owner and Joint Occupational Health and Safety Committee and the Ministry of Labour if friable materials suspected of containing asbestos that was not previously identified become uncovered as required in O. Reg. 278/05.

1.16 Insurance

.1 Refer to Project Contract Documents.

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1.17 Inspection

.1 Inspections of the Asbestos Work Area may be undertaken by the Consultant:

.1 At any time during abatement and/or cleanup activities with or without prior notice.

.2 Within or around the abatement Work Area.

.2 Milestone inspections by the Consultant may include any or all of the following, as applicable to the asbestos operation classification and scope of Work:

.1 Pre-Abatement Inspection: Inspection of containment enclosures, worker and waste decontamination facilities, negative air units, pressure differential monitoring, HVAC isolation, signage and other required protective measures to verify compliance with the Project Contract Documents and applicable regulations. Do not commence asbestos disturbance or removal until the inspection has been satisfactorily completed and written authorization has been received from the Consultant.

.2 Upper Seal Inspection: Inspection of the installation of upper seals above suspended ceilings and around structural, mechanical and electrical components, including penetrations, openings and interfaces with walls, decking and other building assemblies. Verify that seals are continuous, secure and adequately isolate the Work Area from adjacent spaces and ceiling cavities. Complete upper seal installation and obtain the Consultant's acceptance before enclosing or otherwise concealing the seals or proceeding with affected abatement activities.

.3 Bulk or Spot Inspections: Inspections of ongoing asbestos removal activities to assess compliance with specified work procedures, containment integrity, dust control measures and the completeness of material removal. Address deficiencies identified by the Consultant before proceeding with affected work.

.4 Final Visual Inspection: Verification that all specified asbestos abatement work has been completed and that the Work Area, including structural components, equipment and other affected surfaces, is free of visible dust, debris and residual asbestos-containing materials designated for removal. Do not apply lockdown encapsulant until the Consultant has completed a satisfactory visual inspection and provided written authorization.

.5 Clearance Air Monitoring (Type 3 Work Areas): Following satisfactory final visual inspection and application of lockdown encapsulant, where specified, clearance air sampling shall be undertaken by the Consultant for Work Areas requiring air clearance. Results shall meet the specified acceptance criteria before authorization is issued to dismantle containment or release the Work Area.

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.3 Consultant engaged by the Owner to perform inspections and air monitoring is authorized to identify deficiencies in the asbestos work and provide site instructions to ensure compliance with Contract requirements.

.4 Failure to pass the inspections noted above may require the Contractor to expend additional resources to provide satisfactory performance at no additional charge to the Owner. The Consultant is empowered by the Owner to inspect for final cleanliness at completion.

.5 The Contractor will incur the cost of the Consultant's site visit should the Contractor not be ready for a scheduled milestone inspection by the Consultant.

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

.7 Additional inspections or air monitoring that may be required as a result of the Contractor's failure to perform the work satisfactorily may result in back charges to the Contractor at the Owner's discretion.

1.18 Air Monitoring

.1 Air monitoring may be undertaken by the Consultant:

.1 At any time during abatement and/or cleanup activities.

.2 From inside and/or outside of the asbestos abatement Work Area.

.3 On workers engaged in abatement and/or cleaning activities to ensure respiratory safety factors are not exceeded.

.4 For clearance of Type 3 Work Areas.

.2 Air monitoring will be undertaken following NIOSH Method 7400, ASBESTOS and OTHER FIBERS by PCM (Phase Contrast Microscopy).

.3 If air monitoring results indicate areas outside of the Asbestos Work Area/enclosure (i.e. Occupied space) are in excess of 0.05 fibres per millilitre of air (fibre/mL), the following measures are to be implemented by the Contractor:

.1 Stop work within the Asbestos Work Area.

.2 Notify Owner and Consultant who are to investigate the concern.

.3 Work is not to resume until written authorization is provided by the Consultant.

.4 Isolate and clean the contaminated area following Type 2 cleanup measures (no enclosure).

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.5 Maintain isolation of the impacted area and repeat cleaning efforts until results of visual inspection and subsequent air monitoring are found to be acceptable by the Consultant.

.6 Implement other measures as directed by the Consultant to remedy the situation. These may include the installation of negative air units within the impacted area.

.4 If air monitoring results within the Asbestos Work Area are in excess of the respirator protection factor, the following measures are to be implemented by the Contractor:

.1 Stop work within the Asbestos Work Area.

.2 Workers must exit the Asbestos Work Area via the decontamination facility.

.3 Consultant should be notified and the area not re-entered until measures are taken to resolve the issue – workers are not permitted to re-enter until advised by the Consultant in writing.

.5 Final air monitoring will be performed within Type 3 Asbestos Work Areas after the Work Area has passed a visual inspection completed by the Consultant. Final air monitoring results must show fibre levels of less than 0.010 f/cc. If air monitoring results show fibre levels in excess of 0.010 f/cc, the Work Area isolation is to be maintained and interior surfaces re-cleaned, re-inspected by the Consultant before additional lock-down agent is applied to all surfaces. Repeat as necessary until fibre levels are less than 0.010 f/cc.

.6 As an alternative to the above, the Contractor can pay for the analysis of PCM air samples by Transmission Electron Microscopy (TEM) by a NVLAP accredited laboratory.

.7 <u>Contractor to supply a leaf blower and an appropriate number of 20" box fans for aggressive air sampling to be undertaken by the Consultant. One 20" box fan per 10,000 cubic feet of room space.</u>

.8 Costs associated with additional inspections and air monitoring due to deficiencies in the maintenance of the Asbestos Work Area resulting in elevated asbestos fibre levels inside or outside the Work Area may be charged back to the Contractor at the discretion of the Owner.

1.19 Differential Pressure Monitoring

.1 Contractor to provide a functioning digital manometer (with data logging capability) to constantly measure the difference in air pressure between the enclosed area and the area outside of it.

.2 Negative air pressure is to be maintained at less than -0.02 inches of water, relative to the area outside the enclosed Work Area.

.3 Manometer must be placed within an area that is readily visible without the need to enter the contaminated portion of the workspace (i.e. within the clean change room).

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.4 **Stop work and have workers exit the Asbestos Work Area if pressure differential cannot be maintained or cannot be verified due to a malfunctioning manometer**.

.5 Record differential pressure at start and end of each shift.

.6 Manometer must be used at all times and data should be available for review by the Consultant when requested.

PART 2 PRODUCTS

2.1 Materials and Equipment

.1 General Materials

.1 *Amended Water* - water containing a surfactant to reduce water surface tension. Surfactant added at a concentration to provide penetration and wetting of asbestos fibres.

.2 *Lock-Down Sealer* - non-staining, clear, water-dispersible material that is designed for the purpose of trapping residual asbestos fibres. The sealer should remain tacky on surface for at least 8 hours and shall have flame spread and smoke developed rating both less than 50.

.3 *Polyethylene* – minimum 6 mil (0.15 mm) thick unless otherwise specified; in sheet size to minimize joints.

.4 *FR Polyethylene* - minimum 6 mil (0.15 mm) thick, woven fibre reinforced fabric bonded both sides with polyethylene.

.5 *Rip Proof Polyethylene* - minimum 8 mil (0.15 mm) thick, woven fibre reinforced fabric bonded both sides with polyethylene (2 layers each 1.5 mil)

.6 *Tape* - fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

.7 *Plastic Bags* - minimum 6 mil (0.15 mm) thick sheet polyethylene. Bag seams shall be sufficiently strong to resist pressure and shocks that occur under normal conditions of transport.

.8 *Shower* – showering facility for workers providing hot and cold water.

.9 *Manometer* – datalogging unit used to monitor the differential pressure between the interior of the Asbestos Work Area (i.e. enclosure) and the area outside the enclosure. Manometer must be calibrated regularly per manufacturer's instructions. Proof of calibration must be made available to the Consultant when requested.

.10 *Drums* - sturdy non-reusable, steel, aluminum, or plastic, with tight-fitting lids acceptable to the Ontario Ministry of Environment and waste disposal facility.

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.11 *Asbestos Waste Containers* - contain waste in two separate containers. The inner container shall be a 6 mil (0.15 mm) thick sealable polyethylene bag. Outer container shall be a sealable metal or fibre type where there are sharp objects included in the waste material; otherwise the outer container may be sealable metal or fibre type or a second 6 mil (0.15 mm) thick sealable polyethylene bag. Containers should be labelled as prescribed in O. Reg. 347/90 and O. Reg. 278/05.

.12 *Duct Tape* - Good quality, water resistant plastic type.

.13 *Protective Clothing* – shall be provided by the employer and worn by every worker who enters the Work Area. The protective clothing,

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

.2 shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing,

.3 shall include suitable footwear, and

.4 shall be repaired or replaced if torn.

.2 Equipment

.1 *Vacuums* - HEPA filtered wet/dry type with accessories adequate to perform removal and cleanup work or to provide negative pressure in smaller Type 2 Work Areas.

.2 *Negative Air Units* - two-stage HEPA filter system and accessories required to exhaust air to outside of building.

.3 Warning Signage

.1 Provide warning signs to convey the following:

.1 Caution Asbestos Dust Hazard

.2 Work area is restricted to persons wearing protective clothing and equipment

.3 Breathing asbestos dust may cause serious bodily harm

.4 Entry is prohibited except to authorized persons.

.5 Drinking, eating and smoking are prohibited in this area.

.2 Place placards on vehicles transporting asbestos waste in accordance with Transportation of Dangerous Goods Act.

2.2 Hoarding Walls

.1 Install hoarding walls in accordance with Project Contract Documents.

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2.3 Scaffolding/Platforms

.1 Contractor to install scaffolding/work platforms in accordance with Project Contract Documents.

.2 Contractor must ensure scaffolding/platforms comply with regulatory requirements.

.3 Determine the need for scaffolding and provide, install, maintain and remove scaffolding as required to safely complete the Work. Selection and implementation of scaffolding and other access equipment shall remain the Contractor's responsibility as part of the means and methods of construction.

2.4 Decontamination Facilities

.1 Decontamination facilities shall include:

.1 Worker decontamination facility that consists of a clean change room, shower, contaminated change room all linked and each separated by a curtained doorway.

.2 Clean change room must be sufficiently large to comfortably accommodate the number of workers involved with abatement activities. Minimum size is 4 square meters.

.3 Provide hangars/hooks, shelves and/or lockers for the storage of street clothes and personal belongings.

.4 Provide adequate lighting within the clean and dirty rooms.

.5 Minimum shower requirements are one (1) shower unit for every six (6) workers.

.6 Provide and maintain shower facilities with a continuous supply of hot and cold running water, or temperature-controlled water maintained between 40°C and 50°C, with individual controls within each shower to regulate water flow. Equip showers with appropriate temperature controls to prevent scalding, adequate drainage, soap and a sufficient supply of clean towels. Maintain facilities in a clean, sanitary and fully operational condition throughout the Work

.7 Rigid piping to be installed with watertight connections for supply of water to the shower and for drains.

.8 Install water filtration system for shower facility drainage (i.e. Sylprotec wastewater filtration pump).

.9 Install ground fault circuit interrupter for all power supplied for pumps, filtration systems etc.

.10 Do not route electrical cables, extension cords or other electrical wiring through shower facilities. Ensure all electrical installations and equipment are located and protected to prevent exposure to water and associated electrical hazards.

.11 Install wall-mounted fire extinguisher within clean change room.

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.12 Contaminated change room must be sufficiently large to comfortably accommodate the number of workers involved with abatement activities. Minimum size is 4 square metres.

.13 Install waste container designated for asbestos-contaminated protective clothing within the worker decontamination change room.

.14 Waste decontamination facility that consists of a transfer room and waste container cleaning room all linked and each separated by a curtained doorway. Waste is not to be removed through the Worker Decontamination Facility – a separate Waste Decontamination Facility is to be setup for the removal of waste from the Type 3 Work Areas.

.15 Container cleaning room must be of sufficient size to allow for cleaning of waste bags, double bagging waste and decontaminating tools, equipment etc. Wastewater generated must be treated as asbestos waste.

2.5 Negative Pressure Ventilation System Using Negative Pressure Machines

.1 Provide negative pressure ventilation system that is separate from building mechanical system meeting the following requirements:

.1 DOP testing is undertaken per the requirements of this section.

.2 Make-up air is drawn through the decontamination facility.

.3 Exhaust air is vented through the use of impermeable flexible ducting to the exterior of the Asbestos Work Area or to the exterior of the building.

.4 When venting indoors, metal reinforced polyethylene discharge ducting should be used to protect ducting from damage or collapse.

.5 Provide at least three exchanges of the total volume of air within the Asbestos Work Area per hour.

.6 Negative air units are placed so as to maximize distance between units.

.7 Filters are replaced in accordance with manufacturers' instructions.

PART 3 EXECUTION

3.1 Project Requirements

.1 Comply with the following requirements when performing the following Type 3 operations within the Work Area.

.1 The removal or disturbance of more than one square metre of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part

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of a building, aircraft, ship, locomotive, railway car or vehicle or any machinery or equipment.

.2 The spray application of a sealant to friable asbestos-containing material.

.3 Cleaning or removing air handling equipment, including rigid ducting but not including filters, in a building that has sprayed fireproofing that is asbestos-containing material.

.4 Repairing, altering or demolishing all or part of a kiln, metallurgical furnace or similar structure that is made in part of refractory materials that are asbestos-containing materials.

.5 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material, if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters.

.6 Repairing, altering or demolishing all or part of any building in which asbestos is or was used in the manufacture of products, unless the asbestos was cleaned up and removed before March 16, 1986.

3.2 HVAC System Isolation

.1 Shut down HVAC system serving the Asbestos Work Area. Maintain operation of the HVAC system to other parts of the building – do not disrupt HVAC to other areas of the building.

.2 Follow O. Reg. 278/05 Type 3 procedures for disturbance, alteration, cutting, disconnection, capping or removal of existing ductwork, as interior surfaces of ductwork throughout the building are presumed contaminated with asbestos-containing sprayed fireproofing residue and debris. Implement appropriate containment, HVAC isolation, HEPA vacuuming, wet wiping and other asbestos control measures to prevent the release or migration of asbestos fibres. Thoroughly clean affected duct interiors at points of disturbance and securely cap or seal all open duct ends to prevent the spread of contamination into adjacent areas or connected HVAC systems, in accordance with the Project Contract Documents and as specified herein.

.3 Cut and cap HVAC supply and return air ductwork at points of entry into the asbestos abatement Work Areas to isolate the Work Areas from the remainder of the HVAC system. Provide rigid, airtight caps securely fastened to duct ends, with all joints, seams and penetrations sealed to prevent the migration of asbestos fibres. Coordinate HVAC shutdown and isolation with the Owner. Undertake cutting, capping and associated disturbance of presumed asbestos-contaminated ductwork using O. Reg. 278/05 Type 3 procedures, as specified herein.

.4 Seal openings to HVAC system with polyethylene sheeting to prevent asbestos fibres from entering system.

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.5 HVAC system serving the Asbestos Work Area is to remain isolated for the duration of the work until completion.

3.3 Electrical System Isolation

.1 Isolate electrical systems which will remain energized in the Asbestos Work Area, with ground fault interrupters, otherwise disconnect existing power supply to the Asbestos Work Area. Power to other areas of the building must not be disrupted.

.2 Use only ground fault protected electrical services of sufficient capacity for electrical equipment used in the Asbestos Work Area.

.3 Ensure all openings on electrical equipment are water and dust resistant.

.4 Electrical panels are to be inspected by the Electrical Safety Authority and

.5 Only CSA approved parts are to be used.

.6 Licensed electrician to install, inspect and maintain all required electrical protection systems within asbestos abatement Work Areas. Ensure the electrician has received asbestos hazard awareness training and instruction in Type 3 asbestos abatement Work Area entry, exit and decontamination procedures. Provide and require the use of appropriate personal protective equipment, including fit-tested respiratory protection and disposable protective clothing, in accordance with O. Reg. 278/05 and as specified herein. Coordinate all electrical work with the asbestos abatement contractor to maintain containment integrity and prevent asbestos exposure or cross-contamination.

3.4 Asbestos Abatement Enclosure Installation

.1 Isolate Asbestos Work Area from the remainder of building.

.2 Seal off openings in the perimeter including, but not limited to, the following:

.1 Heating and ventilation grills and outlets.

.2 Doorways.

.3 Corridors.

.4 Openings for lighting and electrical systems.

.5 Ceiling and floor openings above and below Work Area, including plumbing and conduit chases.

.3 Seal HVAC supply and return air louvres and grilles with two layers of polyethylene sheeting to prevent contamination of the system.

.4 Use barrier materials to construct entrances, exits and transfer openings to decontamination area.

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.5 Construct free standing abatement enclosure, running from floor to underside of structure above, using wood or steel studs spaced at maximum 600 mm on centre with polyethylene sheeting on both sides of the wall (Type A Hoarding). Seal joints and perimeter with tape.

.6 Install upper seals following the procedures provided below.

.7 Protect walls within Work Area with **two layers of polyethylene sheeting** mechanically fastened at the top and bottom of the wall. Seal joints with tape.

.8 Where polyethylene is supported by the ceiling system for access to a ceiling system, ensure the ceiling system is able to support the weight of the polyethylene.

.9 Protect wall-mounted equipment from asbestos contamination by sealing with polyethylene. All equipment that may be damaged by the use of water is to be protected. Where equipment is left exposed, thoroughly clean after completion of asbestos abatement work.

.10 Install transparent windows to allow observation of entire Work Area from outside the enclosure.

.11 Install worker decontamination facility as follows:

.1 Construct equipment and access room between shower room and Asbestos Work Area using two curtained doorways, one to the shower room and one to Work Area. Facility should be large enough to comfortably accommodate the number of workers engaged in abatement work, a waste receptor, a storage facility for workers' shoes and protective clothing as well as any other equipment that may be needed. Minimum size is four (4) square metres.

.2 Install shower room between the clean room and equipment and access room, with two curtained doorways, one to the clean room and one to equipment and access room. One shower should be provided for every six (6) workers. Provide a constant supply of hot and cold or warm water. Provide piping and connect to water sources and drains. Separate hot and cold connections are required for the water supply to the shower. No mixing of the water is allowed at the point source. Pump wastewater through a 5-micrometre filter system before directing into drains. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.

.3 Construct clean room between the shower room and clean areas outside of the abatement enclosure, with two curtained doorways, one to outside of enclosures and one to shower room. Lockers or hangers and hooks are to be provided for workers' street clothes and personal belongings as well as storage for clean protective clothing and respiratory equipment and a mirror to permit workers to fit respiratory equipment properly.

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.12 Provide and maintain a two-stage waste and equipment decontamination facility, separate from the worker decontamination facility, as follows:

.1 Construct suitable framing and enclose with two layers of polyethylene sheeting on walls and floors. Secure and seal all joints, seams and connections to maintain airtight containment.

.2 Provide two compartments consisting of a contaminated equipment cleaning room and a clean transfer room, separated by overlapping polyethylene curtain doorways.

.3 Maintain appropriate negative pressure and airflow direction to prevent the migration of asbestos fibres into uncontaminated areas.

.4 HEPA vacuum and/or wet wipe waste containers, tools and equipment before transfer to the clean room. Ensure asbestos waste is securely packaged and sealed before removal.

.5 Maintain the facility in good condition throughout the Work. Repair damaged barriers and seals immediately.

.6 Do not dismantle the facility until all asbestos waste and contaminated equipment have been removed and required inspections and clearance procedures have been satisfactorily completed, as specified herein.

.13 Supply sufficient lighting to provide a safe working environment.

3.5 Maintenance of Asbestos Work Area

.1 Inspect the condition of the abatement enclosure on regular intervals to ensure integrity of the enclosure has not been compromised. Immediately correct deficiencies.

.2 Cleanup asbestos-containing waste on a regular basis during work and once removal work has been completed. Do not allow accumulation of waste materials within the Work Area. Cleaning to be done using HEPA vacuum and/or damp wiping. Do not use compressed air for cleaning. All waste to be placed in waste disposal containers and/or waste bags.

.3 Do not allow the accumulation of standing water within the Work Area and limit the use of water to avoid leakages to the floors beneath the Work Area.

.4 Inspect all HEPA filtered equipment including negative pressure machines and vacuums at the start and end of each shift to ensure:

.1 equipment is operating according to manufacturers' specifications.

.2 HEPA filters are in good condition, not overloaded and are replaced as needed.

.3 ducting is intact and venting properly.

.5 Water supply is turned off prior to leaving the Work Area at the end of a shift.

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.6 Exterior of waste bags should be cleaned using HEPA vacuum and/or damp wiping then placed into a second clean waste bag, sealed then immediately removed from the asbestos work enclosure.

.7 Asbestos waste should be removed from site, transported and disposed of in accordance with all Federal, Provincial and local regulatory requirements.

.8 Once asbestos-containing materials have been fully removed, thoroughly clean the Work Area and adjacent areas using HEPA vacuum and/or damp wiping.

.9 Do not commence teardown of the Asbestos Work Area enclosure until the Consultant has completed the final inspection, satisfactory clearance air testing results have been obtained, and written authorization to proceed with teardown has been issued by the Consultant.

3.6 Procedures

.1 Setup of the Abatement Work Area

.1 Undertake pre-removal survey for damage.

.2 Remove non-fixed items from the Work Area and store as directed by the Owner.

.3 Shutdown HVAC system serving the Work Area. Maintain HVAC system to other parts of the building.

.4 Cut and cap ductwork serving the Work Area.

.5 Isolate HVAC system openings with poly sheeting secured with adhesive tape.

.6 Post warning signs in English and French at all access points to the Asbestos Work Area in large clearly visible letters warning of an asbestos dust hazard and that access to the area is restricted to persons wearing protective clothing and equipment.

.7 Follow Type 2 cleaning operations to pre-clean the Asbestos Work Area prior to the start of any abatement work. Using HEPA vacuum or damp cloths (where damp cleaning does not create a hazard), remove visible dust and debris from surfaces within the Work Area. Do not use compressed air to clean up or remove dust from surfaces.

.8 Install upper seals prior to the start of bulk asbestos removal work (see section below for installation of upper seals where fire spray is present). Coordinate with the Consultant for milestone inspection of upper seals (minimum 24-hour notice is required).

.9 Maintain emergency and fire exits from Asbestos Work Area and maintain extra routes from occupied areas in accordance with authorities having jurisdiction.

.10 Install emergency exit signs as required to mark exit routes.

.11 Install and operate the HEPA filtered negative air system appropriate for the size of the Work Area and in accordance with requirements of this section.

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.12 Isolate electrical system.

.13 Asbestos removal may not commence until the Work Area setup has been inspected by the Consultant and authorization to proceed with removal activities is given in writing.

.2 Asbestos Removal - General

.1 Supply amended water for the wetting of materials to be removed.

.2 Remove asbestos-containing materials as specified for the particular material being abated.

.3 Cleanup waste on a regular basis.

.4 Place waste in asbestos appropriate containers in accordance with requirements of this section.

.5 All waste bins must be covered and secured with a lock when waste bin is not being used.

.6 Once bulk removal activities have been completed, clean all surfaces within the enclosure by HEPA vacuuming or wet wiping/mopping surfaces.

.7 Once final cleaning has been completed, the Work Area is to be inspected by the Consultant (refer to section below on final cleaning standards that will apply).

.8 Upon receiving approval from the Consultant that the Work Area has been adequately cleaned, apply lock-down sealant to all surfaces within the enclosure including surfaces from which asbestos-containing materials were removed.

.9 Apply lock-down sealant in accordance with manufacturer's instructions.

.10 Do not apply the lock-down sealant to materials that may be damaged by its application.

.11 Allow sufficient time for the lock-down agent to settle and dry prior to teardown of the enclosure unless air testing is to be undertaken in which case, teardown cannot occur until air monitoring results are found to be acceptable and written authorization to tear down is provided by the Consultant.

.3 General Sequence

.1 Abatement is suggested to be completed in the following sequence (alternatives may be provided in written plan for review and approval by the Consultant):

- Setup one Type 3 Work Area (including separate worker and waste decontamination facilities).
- Shutdown HVAC system serving the Work Area.
- Setup scaffolding, platforms etc. to access ductwork, as required.

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- Isolate and protect mechanical and electrical systems.
- Install all upper seals.
- Isolate return air grilles with hard cap and poly sheeting secured with adhesive tape.
- Notify Consultant to complete a pre-inspection of the Type 3 Work Area.
- If Work Area passes pre-inspection, proceed with the procedure described below to cut and cap supply ductwork. Follow O. Reg. 278/05 Type 3 procedures to cut and cap mechanical ductwork serving the Work Area. Under contaminated conditions, cut the ductwork at the entry point to the Work Area. Clean (HEPA-vacuum and wet-wipe) the interior surfaces of the remaining ductwork to an arm's length. Following cleaning, install a polyethylene barrier within the retained duct section to prevent fibre migration; this barrier shall be removed after abatement work is completed and new ductwork has been tied in. Note: Tie-in of new ductwork to the existing contaminated ductwork shall be performed under Type 2 safe work procedures as described below. New ductwork must include an access hatch to allow removal of the internal polyethylene barrier prior to re-energizing the HVAC system.
- Notify Consultant to inspect upper seals once supply ductwork has been fully isolated.
- If installation of upper seals are found to be acceptable by the Consultant, removal activities may start.
- Remove contaminated HVAC components for disposal as asbestos waste.
- Remove and dispose of asbestos-containing materials in accordance with Project Contract Document requirements.
- Complete detailed cleaning of all surfaces within the Work Area.
- Notify Consultant for a final inspection once all surfaces have been adequately cleaned and dried. Final inspections will only be completed if surfaces are dry.
- Apply lock-down if Work Area passes final inspection.
- Consultant to conduct air monitoring.
- Tear down Type 3 Work Area if air monitoring is found to be acceptable.

.4 <u>Installation of Upper Perimeter Seals</u>

.1 Follow O. Reg. 278/05 Type 3 procedures for installation of upper perimeter seals prior to commencing bulk removal of asbestos-containing materials. Establish appropriate

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containment, negative pressure, worker decontamination facilities and other required protective measures before disturbing asbestos-containing materials.

.2 Shut down and isolate HVAC systems serving the Work Area prior to installing upper seals. Seal supply, return and exhaust openings to prevent migration of asbestos fibres into adjacent spaces or connected HVAC systems.

.3 Carefully remove perimeter suspended ceiling tiles, sections of hard ceilings and other materials as necessary to access locations requiring upper seals. Implement appropriate asbestos precautions to prevent contamination of adjacent areas and ceiling spaces.

.4 Prior to installation of upper seals, HEPA vacuum and/or wet wipe accumulated asbestos-containing dust and debris from the upper surfaces of adjacent ceiling tiles, ceiling grids, drywall ceilings and other affected surfaces, as appropriate. Avoid unnecessary disturbance of existing sprayed fireproofing.

.5 Install continuous upper perimeter seals using reinforced, rip-resistant polyethylene sheeting, securely fastened and sealed with suitable adhesive tape and other appropriate materials. Extend seals from perimeter containment barriers to the underside of the structural deck or other suitable solid surfaces to provide effective isolation of the Work Area from adjacent ceiling spaces.

.6 Form and securely seal upper barriers around structural beams, open web steel joists, columns, conduits, piping, ductwork, hangers and other penetrations or obstructions. Provide suitable framing, rigid backing or additional support where necessary to ensure seals remain secure and airtight under operating negative pressure.

.7 Seal all openings, joints, gaps, voids and interfaces between upper seals and existing building components. Ensure barriers are continuous and effectively isolate the Work Area from adjacent rooms, ceiling plenums and other concealed spaces. Do not rely on suspended ceiling tiles or ceiling grids alone to provide airtight isolation.

.8 Maintain appropriate negative pressure within the containment during installation and inspect seals for damage, gaps, loose connections or air leakage. Repair deficiencies immediately and ensure seals remain intact throughout subsequent abatement activities.

.9 Arrange for inspection of completed upper seals by the Consultant prior to commencing bulk removal of asbestos-containing materials. Provide a minimum of 24 hoursadvance notice. The Consultant may assess the integrity and effectiveness of upper seals using smoke tubes or other appropriate methods.

.10 Do not commence bulk removal of asbestos-containing materials until the upper seals have been satisfactorily inspected and written authorization to proceed has been

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received from the Consultant. Correct identified deficiencies and arrange for reinspection as required.

.5 Asbestos Removal – Contaminated HVAC System Components

.1 Remove existing HVAC system components (including but not limited to ductwork, plenums, air-handling units, fans, dampers, VAV boxes, mixing boxes, diffusers, grilles, registers, louvres, filter housings, heating and cooling coils, duct silencers, access hatches, associated fittings and other components exposed to the internal airstream) internally contaminated with asbestos-containing sprayed fireproofing fibres and debris under Type 3 asbestos procedures, in accordance with O. Reg. 278/05 and the Project Contract Documents).

.2 HEPA vacuum and/or damp wipe accessible exterior surfaces of ductwork, including joints, seams, supports and connections, prior to dismantling.

.3 Remove ductwork in manageable sections, preferably at existing joints and connections, to minimize cutting, vibration, disturbance of internal contamination and potential fibre release. Avoid crushing, dropping or otherwise damaging duct sections during removal.

.4 Prior to disconnecting or cutting duct sections, implement measures to prevent the release of asbestos fibres and debris from within the ductwork. Where practicable, seal open ends of duct sections with double 6-mil polyethylene sheeting and adhesive tape immediately upon separation. Maintain seals throughout handling and removal.

.5 Where cutting of ductwork is necessary, use methods that minimize dust generation and disturbance of internal contamination. Provide localized HEPA-filtered vacuuming at cutting locations and employ wet methods where appropriate and safe. Do not use compressed air or cutting methods that generate uncontrolled dust or debris.

.6 HEPA vacuum and damp wipe accessible exterior surfaces of each duct section following dismantling and prior to wrapping. Remove loose asbestos-containing debris generated during dismantling using HEPA-filtered vacuum equipment and/or wet cleaning methods.

.7 Wrap each duct section in a minimum of two layers of 6-mil polyethylene sheeting. Fully seal all seams, joints, openings and penetrations with adhesive tape to provide a secure, airtight and leak-tight package. Provide additional protection at sharp edges and corners to prevent puncturing or tearing of the polyethylene.

.8 Transfer sealed duct sections to the designated waste decontamination facility. Handle and transport sections in a manner that prevents damage to the packaging or release

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of asbestos fibres and debris. Dispose of contaminated ductwork as asbestos waste in accordance with applicable regulatory requirements.

.9 Complete detailed cleaning of all surfaces within the Asbestos Work Area, including floors, walls, ceilings, structural members, duct supports, hangers, penetrations, ledges and other horizontal and vertical surfaces. Remove all visible dust, debris and residues using HEPA-filtered vacuum equipment and wet cleaning methods.

.10 Seal filled asbestos waste containers and HEPA vacuum and/or wet wipe exterior surfaces prior to transfer through the waste decontamination facility. Inspect all packaging for damage and repair or repackage as necessary to prevent fibre release.

.11 Do not commence teardown of the Asbestos Work Area enclosure until the Consultant has completed the final inspection, satisfactory clearance air testing results have been obtained, and written authorization to proceed with teardown has been issued by the Consultant.

.6 <u>Asbestos Removal – Asbestos-Containing Block Wall Primer and Potentially Contaminated Concrete Block Walls</u>

General Requirements and Sequence of Work

.1 Undertake removal of concrete block walls coated with asbestos-containing primer using Type 3 asbestos procedures, within the designated Work Areas and in accordance with O. Reg. 278/05 and the Project Contract Documents.

.2 Assume that hollow cavities within existing concrete block walls may contain asbestos-containing sprayed fireproofing fibres, dust and debris, including contamination originating from fireproofing applications above ceilings and within adjacent concealed spaces.

.3 Incorporate block wall removal into the Type 3 asbestos abatement enclosures established for the removal of asbestos-contaminated ductwork, where the Work Areas overlap or are immediately adjacent. Coordinate the sequence of ductwork and block wall removal to minimize disturbance of asbestos-containing materials and prevent cross-contamination.

.4 Do not commence block wall removal until the required Type 3 enclosure, decontamination facilities, negative pressure ventilation equipment and other specified asbestos controls have been installed, inspected and accepted by the Consultant.

.5 Prepare the Type 3 Work Area including pre-cleaning surfaces as described above.

Removal of Concrete Block Walls

.6 Remove designated concrete block walls including mortar joints and associated debris, within the established Type 3 enclosure.

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.7 Expect that hollow block cavities may contain loose asbestos-containing sprayed fireproofing fibres, dust and debris. Exercise particular care when opening or disturbing these cavities to prevent the uncontrolled release of concealed contamination.

.8 Do not use compressed air, dry sweeping or other methods that may disperse asbestos fibres.

.9 Progressively remove asbestos-contaminated masonry, mortar and associated debris from the immediate demolition area. Do not permit excessive accumulations of loose materials on floors, scaffolding, platforms or other surfaces.

.10 Place removed blocks, masonry fragments, mortar and associated contaminated debris directly into suitable asbestos waste containers as removal progresses. Use heavy-duty asbestos waste bags, rigid containers or other approved packaging appropriate for the size, weight and sharp edges of the materials.

.11 Do not overfill waste bags or containers. Provide additional protection against punctures and tears caused by masonry edges. Double-bag or otherwise package waste to provide sealed, leak-tight containment suitable for handling and disposal.

.12 HEPA vacuum and wet wipe exposed surfaces, tools and surrounding areas progressively throughout demolition.

Cleaning and Sealing of Remaining Concrete Block Walls

.13 Following removal of designated block wall sections, carefully inspect all exposed edges, remaining block courses, hollow cavities, mortar joints and adjoining construction for asbestos-containing dust, debris and residues.

.14 Thoroughly HEPA vacuum and wet clean accessible cavities and exposed surfaces of remaining concrete blocks, including voids, openings, cracks, crevices and irregularities that can reasonably be accessed using suitable cleaning equipment and tools.

.15 Remove all visible loose dust and debris from accessible cavities before permanently sealing exposed openings.

.16 Seal all exposed hollow block cavities and openings created by demolition to prevent the migration or future release of asbestos-containing fibres and debris that may remain within adjacent or concealed portions of the block wall.

.17 Where contamination cannot be effectively removed from concealed or inaccessible cavities, notify the Consultant. Do not leave exposed or potentially contaminated openings unsealed.

.7 <u>Procedure for Tie-ins of New Ductwork to Existing Asbestos-Contaminated Ductwork</u>

General Requirements and Regulatory Compliance

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.1 Assume that the interior surfaces of existing HVAC ductwork in buildings containing asbestos-containing sprayed fireproofing may be contaminated with asbestos fibres and debris.

.2 Coordinate all proposed connections between new ductwork and existing asbestos-contaminated ductwork with the asbestos abatement contractor, mechanical contractor and Consultant.

.3 **The cleaning of existing asbestos-contaminated ductwork is classified as a Type 3 operation under O. Reg. 278/05, subsection 12(4), paragraph 3. The localized cleaning and temporary barrier removal procedures described herein are proposed alternative measures incorporating Type 2 asbestos precautions.**

Equivalent Measures and Procedures:

.4 **Implement the proposed alternative procedures only where the constructor or employer has established and documented that the measures provide protection for workers at least equivalent to the prescribed requirements of O. Reg. 278/05, in accordance with Section 23.**

.5 **Provide advance written notice of the varied procedures to the joint health and safety committee or health and safety representative, if any, as required by the regulation.**

.6 **Submit the documented procedures and supporting assessment to the Consultant prior to commencing work. Where equivalent protection cannot be established, follow the prescribed Type 3 asbestos procedures.**

Preparation of Existing Ductwork During Type 3 Abatement

.7 During the original Type 3 asbestos abatement operations, identify and prepare all existing ductwork locations designated for future connections to new ductwork.

.8 Prior to capping the existing ductwork, thoroughly clean accessible interior surfaces using HEPA-filtered vacuum equipment and wet wiping methods. Extend cleaning a minimum of one arm's reach in all accessible directions from each proposed tie-in location. Remove all visible asbestos-containing dust, debris and residues.

.9 Following cleaning, install a temporary polyethylene barrier within the existing ductwork, beyond the limits of the cleaned section. Secure and seal the barrier around its entire perimeter to prevent the migration of asbestos fibres and debris from the remaining contaminated ductwork into the cleaned section.

.10 Have the cleaned duct sections and temporary internal polyethylene barriers inspected by the Consultant prior to capping the ductwork. Correct identified deficiencies as directed by the Consultant.

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.11 Cap and seal the prepared duct openings following acceptance by the Consultant. Maintain the temporary internal polyethylene barriers in place until completion of the subsequent mechanical tie-ins.

.12 Clearly identify and document all prepared tie-in locations, including the approximate location of each internal barrier. Provide photographic documentation of the cleaned duct sections and installed barriers prior to capping.

Precautionary Re-cleaning Prior to Mechanical Tie-ins

.13 Prior to the mechanical contractor undertaking tie-ins, have the asbestos abatement contractor re-clean the previously cleaned and isolated sections of existing ductwork as a precautionary measure.

.14 Undertake precautionary re-cleaning using the alternative safe work procedure specified herein, incorporating Type 2 asbestos precautions (without a full enclosure), subject to satisfying the equivalent protection requirements of Section 23 of O. Reg. 278/05.

.15 Establish a controlled Work Area at each tie-in location. Restrict access to authorized personnel, provide asbestos warning signage and install polyethylene drop sheets beneath and around the work location. Provide additional protection to adjacent surfaces and equipment as required.

.16 Wear appropriate disposable protective clothing and respiratory protection during all activities involving access to the interior of existing ductwork. Provide HEPA-filtered vacuum equipment and wet cleaning materials at each work location.

.17 Maintain the affected HVAC system shut down and isolated. Carefully remove the temporary external duct caps without disturbing the internal polyethylene barriers.

.18 Thoroughly HEPA vacuum and wet wipe accessible interior surfaces of the previously cleaned duct sections, including exposed surfaces of the temporary internal polyethylene barriers. Remove all visible dust, debris and residues.

.19 Inspect the temporary internal polyethylene barriers to confirm they remain intact, securely attached and fully sealed around their perimeters. Repair or replace damaged, loose or otherwise deficient barriers using appropriate asbestos precautions.

.20 Following completion of precautionary cleaning, HEPA vacuum and wet wipe surrounding surfaces and remove asbestos waste and contaminated protective materials from the Work Area.

.21 Have the cleaned duct sections and temporary internal barriers inspected and accepted by the Consultant prior to commencing mechanical tie-ins.

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Mechanical Tie-ins to Existing Ductwork

.22 Provide access hatches in the new ductwork immediately adjacent to each connection to existing ductwork to facilitate subsequent access to and removal of the temporary internal polyethylene barriers.

.23 Following acceptance of the precautionary cleaning and temporary barriers, permit the mechanical contractor to connect new ductwork to the previously cleaned and isolated sections of existing ductwork without asbestos protective clothing or respiratory protection, provided the work is confined to the cleaned sections and does not disturb potentially contaminated surfaces or compromise the temporary barriers.

.24 Maintain the affected HVAC system shut down and isolated throughout the mechanical tie-in operations. Do not operate the system while temporary internal polyethylene barriers remain in place.

.25 Do not disturb ductwork beyond the limits of the previously cleaned sections. Where additional disturbance of potentially contaminated ductwork is required, suspend the affected work and consult with the Consultant to determine appropriate asbestos precautions.

Removal of Temporary Internal Polyethylene Barriers

.26 Following completion of mechanical tie-ins, have the asbestos abatement contractor return to remove the temporary internal polyethylene barriers through the access hatches provided in the new ductwork.

.27 Undertake barrier removal using the alternative safe work procedure specified herein, incorporating Type 2 asbestos precautions without a full enclosure, subject to satisfying the equivalent protection requirements of Section 23 of O. Reg. 278/05.

.28 Establish a controlled Work Area at each access hatch. Restrict access to authorized personnel, provide asbestos warning signage and install polyethylene drop sheets beneath and around the work location.

.29 Wear appropriate disposable protective clothing and respiratory protection during barrier removal and associated cleaning activities. Provide HEPA-filtered vacuum equipment and wet cleaning materials at each work location.

.30 Carefully detach and remove the temporary internal polyethylene barriers through the access hatches, minimizing disturbance of potentially contaminated surfaces and accumulated dust or debris within the remaining existing ductwork. Use HEPA-filtered vacuum equipment at the point of disturbance as required to control potential fibre release.

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.31 Immediately place removed polyethylene barriers and associated contaminated materials into suitable asbestos waste containers. Seal waste containers and HEPA vacuum and/or wet wipe exterior surfaces prior to removal from the Work Area.

.32 HEPA vacuum and wet wipe accessible interior surfaces of the new ductwork and adjoining existing ductwork following barrier removal. Remove all visible dust, debris and residues generated during the work.

.33 Inspect and securely close all access hatches following completion of cleaning. Remove polyethylene drop sheets and other temporary protective materials using appropriate asbestos precautions.

Final Inspection and HVAC System Recommissioning

.34 Have the completed work inspected by the Consultant, including verification that all temporary internal polyethylene barriers have been removed and that accessible duct surfaces and surrounding work areas are free from visible dust, debris and residues.

.35 Correct identified deficiencies and complete any additional cleaning or asbestos precautions required by the Consultant.

.36 Do not restart the affected HVAC system until all temporary internal barriers have been removed, access hatches have been securely closed, final cleaning has been completed and written authorization to proceed has been issued by the Consultant.

.8 <u>Asbestos Removal – Floor Mastic, Levelling Compound and Associated Materials (Mechanical Grinding without HEPA Filtered Dust Collection)</u>

.1 Remove all floor mastics, levelling compounds, adhesives and associated materials confirmed or presumed to contain asbestos within the designated Work Areas using mechanical grinding equipment without HEPA-filtered dust collection attachments, under Type 3 asbestos procedures in accordance with O. Reg. 278/05 and the Project Contract Documents.

.2 Undertake grinding only within fully established and operational Type 3 asbestos enclosures, including required negative pressure ventilation, decontamination facilities and respiratory protection. Do not commence grinding until the enclosure has been inspected and accepted by the Consultant.

.3 Use appropriate grinding equipment and methods to achieve complete removal of designated materials while minimizing unnecessary damage to the underlying substrate. Employ wet grinding methods where practicable to control airborne dust and fibre release. Maintain appropriate electrical safety precautions when using water with powered equipment.

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.4 Where dry grinding of asbestos-containing or presumed asbestos-containing non-friable materials is undertaken using powered equipment without HEPA-filtered dust collection attachments, provide and require workers to wear pressure-demand supplied-air respirators equipped with half-masks, as required by Table 2 of O. Reg. 278/05. Comply with all applicable requirements for supplied-air respiratory protection under Section 13 of the Regulation.

.5 Do not use chemical solvents or solvent-based products for removal of floor mastics or levelling compounds. Prevent liquids, slurry and debris from entering floor penetrations, joints, drains or occupied spaces below.

.6 Remove all asbestos-containing materials, including residual films and deposits within cracks, pits, crevices, joints, depressions, voids and other accessible substrate irregularities. Use supplementary hand tools or other suitable equipment where mechanical grinding cannot effectively access these locations.

.7 Maintain continuous operation of the negative pressure ventilation system throughout grinding activities. Monitor enclosure integrity and maintain dust and fibre control measures to prevent contamination of adjacent areas.

.8 Progressively remove accumulated grinding dust, slurry and debris using HEPA-filtered vacuum equipment and/or wet cleaning methods. Do not permit excessive accumulation or redistribution of contaminated materials within the Work Area.

.9 Following grinding, thoroughly HEPA vacuum and wet clean all exposed substrates, horizontal and vertical surfaces, equipment and other accessible surfaces within the Work Area. Remove all visible dust, debris, residues and remaining asbestos-containing materials.

.10 Have the completed removal and cleaning inspected by the Consultant. Undertake additional grinding, scraping or cleaning as required to achieve satisfactory removal, at no additional cost to the Owner. Do not commence final clearance procedures until the Consultant has accepted completion of the removal and cleaning.

.11 Complete removal shall be determined by the absence of visible residual mastic and levelling compound on exposed substrates. Discoloration or staining of concrete alone shall not constitute residual material, subject to acceptance by the Consultant.

.9 Asbestos Removal – Sprayed Fireproofing, Residual Sprayed Fireproofing and Associated Asbestos Contamination (Greater Than 1 m² – Type 3 Operations)

Scope and Work Classification

.1 This section applies to the removal or disturbance of more than 1 m² of friable asbestos-containing sprayed fireproofing, including residual asbestos-containing

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sprayed fireproofing, as required by the Project Contract Documents and assessed site conditions. Complete work in accordance with Type 3 asbestos procedures under O. Reg. 278/05.

.2 Although sprayed fireproofing within some designated Project areas has been identified as non-asbestos-containing, older residual asbestos-containing sprayed fireproofing may remain beneath or behind newer fireproofing, on structural members and around mechanical, electrical and other building components. The precise locations and quantities of residual material have not been fully established due to existing access restrictions and concealed conditions.

.3 Assess exposed surfaces for the presence and extent of residual asbestos-containing sprayed fireproofing as work progresses. Where newer non-asbestos-containing fireproofing conceals residual asbestos-containing sprayed fireproofing, remove sufficient newer material, using Type 3 procedures, to expose and assess the underlying surfaces, as required.

.4 In consultation with the Consultants and Owner, determine the extent of removal required to accommodate the Project. Remove asbestos-containing sprayed fireproofing, including residual material, from designated locations and clean all associated surfaces and building components affected by asbestos contamination.

.5 Determine the classification of work based on the total area worked on consecutively within a room or enclosed area, even where the work is divided into smaller operations, in accordance with O. Reg. 278/05. Do not subdivide work to avoid Type 3 classification.

.6 Coordinate asbestos-containing sprayed fireproofing removal with other Type 3 operations, including the cleaning or removal of asbestos-contaminated air-handling equipment and rigid ductwork, where applicable. Complete all such operations in accordance with the applicable sections of the Contract Documents.

Pre-Abatement Planning and Preparation

.7 Before commencing work, submit a written abatement work plan identifying the proposed Work Areas, sequence of operations, anticipated removal quantities, containment arrangements, HVAC isolation requirements, negative air equipment, worker and waste decontamination facilities, removal methods and waste handling procedures. Submit proposed alternatives to the Consultant for review before implementation.

.8 Arrange for the required advance notification of Type 3 operations to the Ministry of Labour, Immigration, Training and Skills Development in accordance with O. Reg. 278/05.

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.9 Coordinate shutdown, isolation and lockout of affected mechanical, electrical and other building systems. Arrange for qualified trades to undertake disconnection, alteration or isolation of equipment where required. Ensure all trades entering or working within the Type 3 asbestos enclosure have appropriate asbestos awareness training, are trained in the use of respiratory protection, protective clothing and decontamination procedures in accordance with O. Reg. 278/05.

.10 Establish designated Type 3 Work Areas in accordance with the Contract Documents. Coordinate and undertake removal of asbestos-contaminated ductwork and asbestos-containing sprayed fireproofing, including residual sprayed fireproofing, within the same Type 3 enclosures.

.11 Provide scaffolding, platforms, lifts and other access equipment required to safely reach all designated removal locations, including structural members, overhead surfaces and concealed areas. Ensure access equipment does not compromise enclosure integrity.

Work Area Enclosure and Decontamination Facilities

.12 Construct complete Type 3 asbestos enclosures using polyethylene sheeting or other suitable materials impervious to asbestos. Seal all joints, penetrations, openings and enclosure perimeters to prevent migration of asbestos dust and fibres. Provide rigid framing and suitable protection where required. Include transparent viewing panels to permit observation of work activities from outside the enclosure.

.13 Install and maintain all required upper seals, including seals at structural penetrations, beam and column intersections, mechanical and electrical penetrations, ceiling interfaces and other locations where asbestos contamination could migrate beyond the enclosure.

.14 Provide separate worker and waste decontamination facilities as specified in the Contract Documents. Worker decontamination facilities must include interconnected contaminated change, shower and clean change rooms, arranged in sequence, with suitable entry and exit curtains, in accordance with O. Reg. 278/05.

.15 Provide a designated waste decontamination facility for cleaning and transferring asbestos waste containers and contaminated equipment from the enclosure. Maintain separation between clean and contaminated areas during waste transfer.

.16 Install HEPA-filtered negative air units of sufficient capacity to establish and maintain a negative pressure of at least 0.02 inches of water relative to adjacent areas. Exhaust filtered air outdoors where practical and in accordance with the Contract Documents. Provide uncontaminated replacement air.

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.17 Measure and record the pressure differential at regular intervals throughout abatement operations. Inspect and maintain negative air units before each use. Immediately correct deficiencies in containment integrity, negative pressure or ventilation performance. Suspend asbestos disturbance until deficiencies are corrected.

.18 Inspect enclosures, barriers and decontamination facilities at the beginning of each work shift, at the end of a shift where no succeeding shift begins immediately, and at least once daily when no shifts occur. Repair identified defects immediately before other work resumes.

.19 Post asbestos hazard warning signs and restrict access to authorized personnel wearing appropriate protective clothing and respiratory protection. Maintain all required facilities and protective measures throughout abatement operations.

HVAC Shutdown, Isolation and Ductwork Preparation

.20 Shut down and isolate the mechanical ventilation system serving the Work Area. Seal supply, return and other HVAC openings to prevent the migration of asbestos fibres to adjacent areas and connected building systems.

.21 Cut and hard-cap all supply and return air ductwork serving the Work Area. Coordinate the locations and sequence of cutting and capping with the mechanical contractor and other affected trades. Complete work under applicable Type 3 procedures and within established containment.

.22 Where retained ductwork may be internally contaminated, cut ductwork at the designated entry or termination point and clean accessible interior surfaces using HEPA-filtered vacuum equipment and wet wiping, extending approximately an arm's length into the retained duct section where safely accessible. Install an internal polyethylene barrier within the cleaned duct section and a rigid exterior cap to prevent fibre migration.

.23 Seal all openings in contaminated ductwork designated for removal before dismantling or transporting the material. Remove and dispose of contaminated ductwork, equipment and associated components as specified in the Contract Documents.

.24 Maintain internal barriers and rigid caps on retained ductwork until subsequent connection or restoration work is completed under appropriately classified asbestos procedures. Provide suitable access for removal of internal barriers before re-energizing affected HVAC systems.

.25 Notify the Consultant when the Type 3 enclosure, worker and waste decontamination facilities, negative air equipment, preliminary HVAC isolation and upper seals are complete. Obtain acceptance of the Work Area setup before proceeding with asbestos disturbance.

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.26 Following completion of ductwork cutting, capping and final isolation, notify the Consultant for inspection of upper seals and HVAC isolation arrangements. Correct identified deficiencies and obtain acceptance before commencing sprayed fireproofing removal.

Asbestos-Containing Sprayed Fireproofing Removal

.27 Thoroughly wet asbestos-containing sprayed fireproofing with water containing a wetting agent using a low-pressure fine-mist sprayer. Maintain the material in a thoroughly wetted condition throughout removal, unless wetting would create a hazard or cause damage.

.28 Remove sprayed fireproofing in small, manageable sections using manual tools and methods that minimize fibre release. Collect removed material directly into suitable asbestos waste containers. Do not permit asbestos-containing material or debris to fall freely from one work level to another.

.29 Remove all designated asbestos-containing sprayed fireproofing, including residual deposits adhering to beams, columns, metal decking, structural connections, brackets, anchors, hangers, threaded rods, mechanical supports, electrical supports and other affected building components.

.30 Where residual asbestos-containing sprayed fireproofing is concealed beneath newer non-asbestos-containing sprayed fireproofing, progressively remove the newer material as necessary to expose the underlying surfaces. Inspect exposed surfaces with the Consultant to determine the extent of residual asbestos-containing material requiring removal. Treat removed material as asbestos waste where asbestos contamination is present or separation cannot be reliably established.

.31 Remove residual asbestos-containing sprayed fireproofing using wet scraping, manual brushing and other suitable methods. Thoroughly clean underlying surfaces to remove adhered deposits and residue. Avoid damage to structural members, protective coatings, equipment and other components.

.32 Do not use dry scraping, grinding, sanding, compressed air or other methods that generate uncontrolled dust. Where wet methods create an electrical or other hazard, submit a written alternative removal plan for the Consultant's review. Ensure the alternative methods and respiratory protection comply with O. Reg. 278/05, including the requirements applicable to dry removal.

.33 Where asbestos-containing sprayed fireproofing extends beyond the designated removal area, terminate removal at locations reviewed with the Consultant. Where required, install suitable non-combustible barriers or mineral wool firestopping to separate retained asbestos-containing sprayed fireproofing from the cleared area.

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Maintain the required fire-resistance performance of affected building assemblies and identify retained asbestos-containing material as specified.

Detailed Cleaning of Work Areas and Building Components

.34 Following removal of asbestos-containing sprayed fireproofing, undertake a thorough cleaning of all exposed and accessible surfaces within the Type 3 Work Area. Cleaning must remove all visible asbestos-containing sprayed fireproofing, residual deposits, dust, debris and other asbestos contamination, including material deposited during removal activities.

.35 Clean all affected building components, including, but not limited to:

Structural components: Beams, columns, joists, metal decking, beam webs and flanges, stiffeners, connection plates, bolts, welds, brackets, anchors, threaded rods, hangers and other structural attachments.

Mechanical components: External surfaces of ductwork, piping, fittings, valves, equipment, supports, hangers, brackets, insulation jacketing and other accessible components.

Electrical components: Conduits, cable trays, raceways, junction boxes, electrical supports, brackets, threaded rods, fixtures and accessible equipment surfaces, using methods appropriate to the equipment and electrical hazards.

Architectural and other building surfaces: Walls, ceilings, floors, concrete surfaces, masonry, metal surfaces, penetrations, ledges, cavities and other surfaces where asbestos-containing material or debris may have accumulated.

Temporary equipment and protection: Scaffolding, platforms, ladders, tools, equipment, enclosure surfaces and other items exposed to asbestos contamination.

.36 Pay particular attention to horizontal surfaces, upper surfaces of structural and mechanical components, ledges, recesses, joints, crevices, connection points, concealed pockets, penetrations and other locations where sprayed fireproofing residues and asbestos-containing dust may accumulate.

.37 Clean affected surfaces using HEPA-filtered vacuum equipment followed by wet wiping, wet brushing or other suitable methods. Remove adhered fireproofing residues by wet manual scraping or brushing, as necessary, without damaging the underlying materials or components. Repeat cleaning until all accessible surfaces are free from visible asbestos-containing material, residue, dust and debris.

.38 Where electrical or other equipment cannot be safely wet cleaned, coordinate with the appropriate trade and use suitable HEPA-filtered vacuum equipment and other

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controlled cleaning methods. Do not introduce water into energized equipment or use cleaning procedures that could damage equipment or create an electrical hazard.

.39 Remove and dispose of contaminated porous materials, coverings, insulation and other components that cannot be adequately cleaned, where required by the Contract Documents. Notify the Consultant of inaccessible areas, concealed contamination or materials that cannot be fully cleaned or removed.

.40 Maintain regular housekeeping throughout the work. Collect asbestos-containing debris and waste at frequent intervals and immediately following removal activities. Place waste, contaminated cleaning materials and disposable protective materials into suitable dust-tight containers impervious to asbestos and clearly identified as asbestos waste. Seal containers and clean their external surfaces using HEPA vacuuming or damp wiping before removal through the waste decontamination facility.

.41 Complete a final detailed cleaning of the entire Work Area, including all exposed structural, mechanical, electrical and architectural surfaces, tools, equipment and enclosure surfaces. Ensure all accessible surfaces are free from visible asbestos-containing sprayed fireproofing, residual deposits, dust and debris. Do not use encapsulants or lock-down agents as substitutes for thorough cleaning.

Final Inspection, Encapsulation and Clearance

.42 Following completion of removal and detailed cleaning, conduct a thorough visual inspection by a competent worker to confirm that the enclosure and all accessible surfaces are free from visible asbestos-containing dust, debris and residue. Correct deficiencies before requesting the Consultant's final inspection.

.43 Allow cleaned surfaces to dry completely and notify the Consultant when the Work Area is ready for final inspection. Final inspections will only be conducted when surfaces are dry.

.44 The Consultant will inspect accessible surfaces within the Work Area, including structural, mechanical, electrical and other building components, to assess whether asbestos-containing sprayed fireproofing, residual deposits, dust and debris have been adequately removed. Complete additional cleaning and arrange for reinspection where deficiencies are identified.

.45 Following satisfactory final visual inspection, apply an approved lock-down agent to designated cleaned surfaces where specified and accepted by the Consultant. Do not apply lock-down over visible asbestos-containing residue or material requiring removal.

.46 Maintain the enclosure, negative air pressure and worker decontamination facilities during final cleaning, inspection and clearance activities.

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.47 Following satisfactory visual inspection and once the Work Area is dry, arrange for clearance air testing by the Consultant.

.48 The Work Area passes PCM clearance air testing only where the concentration of fibres in every sample does not exceed 0.01 fibres/cm³.

.49 Where clearance air testing results are unsatisfactory, complete additional cleaning and visual inspection and allow the Work Area to dry before retesting, in accordance with the Regulation. Maintain containment and negative air pressure until satisfactory clearance has been achieved.

.10 Asbestos Removal – Final Cleaning Standards and Expectations

.1 Thoroughly clean all Work Areas upon completion of abatement activities to ensure all surfaces are free of visible asbestos-containing and non-asbestos-containing dust, debris, residues, loose materials and other contamination. Cleaning shall include, but not be limited to:

- All horizontal surfaces, including floors, structural decking, beams, joists, equipment and other exposed surfaces
- All vertical surfaces, including walls, columns, partitions, equipment and associated components.
- All accessible cracks, joints, gaps, voids, openings, crevices, penetrations and other surface irregularities where dust, debris or residues may have accumulated.
- All accessible surfaces of mechanical, electrical, IT and other building systems and components within the Work Areas, including piping, conduits, cable trays, ductwork and associated supports.
- All corners, perimeter edges, ledges, recessed areas, concealed spaces and other difficult-to-access locations affected by the Work.

.2 Use HEPA vacuuming, wet wiping, wet brushing and other appropriate cleaning methods and tools to achieve thorough removal of accumulated dust, debris and residues. Repeat cleaning as necessary to achieve the specified standards. Do not use dry sweeping or compressed air for cleaning.

.3 Pay particular attention to cracks, crevices, voids, openings and irregular surfaces where asbestos-containing materials or debris may remain lodged. Use suitable tools, including brushes and HEPA vacuum attachments, to remove accessible residues. Do not rely on lockdown encapsulants to cover or conceal inadequately cleaned surfaces.

.4 Identify and clearly mark locations where complete cleaning cannot reasonably be achieved due to restricted access, embedded materials, inaccessible voids or other site

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conditions. Notify the Consultant in writing, including the locations, nature and extent of remaining materials, prior to scheduling the Final Milestone Inspection.

.5 Do not leave residual asbestos-containing materials, dust or debris in place without prior review and written authorization from the Consultant. Implement additional cleaning, removal, isolation or other corrective measures as directed.

.6 Complete a thorough internal inspection of all Work Areas to verify that the specified removal and cleaning requirements have been satisfied before requesting the Final Milestone Inspection. Correct all identified deficiencies prior to the Consultant's inspection.

.7 Maintain containment and applicable asbestos control measures throughout final cleaning, inspection and any required corrective work. Do not apply lockdown encapsulant or dismantle containment until the applicable inspection and authorization requirements have been satisfied, as specified herein.

3.7 Dismantling of the Abatement Enclosure

.1 Upon completion of asbestos abatement work and written authorization to tear down the enclosure has been provided by the Consultant, perform the following:

.1 Wet wipe or HEPA vacuum all tools and equipment prior to removal from the Asbestos Work Area.

.2 Clean all polyethylene surfaces by wet wiping or HEPA vacuuming prior to removal.

.3 Remove polyethylene wall sheets by carefully folding sheets with asbestos exposed side folded in. Dispose of as asbestos waste.

.4 Clean any debris left behind during dismantling procedures by wet wiping and/or HEPA vacuuming surfaces where the abatement enclosure once stood.

.5 Remove other materials from site.

.6 All HEPA filters taken out of service are to be disposed of as asbestos waste.

.7 Seal all inlet and exhaust openings on negative air units and vacuums when units are shut down.

.8 Re-establish items removed from the Work Area.

.9 Restore HVAC system to the Work Area including removal of capped ducts (if applicable).

.10 Vacuum Work Area and ensure the workspace is clean prior to demobilizing.

END OF SECTION

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PART 1 GENERAL

1.1 Related Work

.1 This section is to be read in conjunction with all other sections so as to comply with the General Conditions of the Contract.

.2 Refer to the following related sections:

.1 Section 02 82 00.01 - Type 1 Asbestos Abatement (Minimum Precautions)

.2 Section 02 82 00.02 - Type 2 Asbestos Abatement (Intermediate Precautions)

.3 Section 02 82 00.03 - Type 3 Asbestos Abatement (Maximum Precautions)

.4 Asbestos Abatement Floor Plan Drawings

1.2 Regulations

.1 Work must comply with the following regulations and guidance documents:

.1 Occupational Health and Safety Act (OHSA), R.S.O. 1990

.2 Environmental Protection Act, R.S.O. 1990

.3 Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05

.4 Designated Substances, Ontario Regulation 490/09

.5 General – Waste Management, Ontario Regulation 347/90, Environmental Protection Act

.6 Hazardous Products Act

.7 Transportation of Dangerous Goods Act

.8 Lead on Construction Projects, Ministry of Labour Guidance Document, under the OHSA

.9 Silica on Construction Projects, Ministry of Labour Guidance Document, under the OHSA

.10 EACC Lead Guideline for Construction, Renovation, Maintenance or Repair

.11 EACC Mould Abatement Guidelines

.12 Alert – Mould in Workplace Buildings, Ontario Ministry of Labour

.2 Work must comply with all applicable federal, provincial, and local requirements. In any case where a conflict arises between or among the regulations, guidance documents or with specifications provided herein, the more stringent requirements shall be followed.

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1.3 Definitions

.1 *Air Samples* - samples collected by drawing a specified volume of air through specified sample filters.

.2 *Amended Water* - water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 *Asbestos* - any of the fibrous silicates listed in O. Reg. 278/05.

.4 *Asbestos-Containing Material (ACM)* – a material that contains 0.5 per cent or more asbestos by dry weight and as identified under Existing Conditions.

.5 *Asbestos Work Area* – the area where asbestos-containing materials have been identified for removal, cleanup or that may be disturbed and to which general access is prohibited.

.6 *Asbestos Waste* – refers to asbestos-containing materials and asbestos-contaminated materials or products that have been removed from the asbestos Work Area.

.7 *Building* - defined by the Regulation includes a structure, vault, chamber or tunnel and including (without limitation) its electrical, plumbing, heating and air handling equipment, including rigid duct work of a building or structure.

.8 *Competent Worker* - a worker who is qualified because of knowledge, training and experience to do the specific work, who is familiar with the Act and with the provisions of the Regulations that apply to the work, and who knows of all potential or actual danger to health or safety in the work.

.9 *Construction* – defined by the Act as including "erection, alteration, repair, dismantling, demolition, structural maintenance, painting, land clearing, earth moving, grading, excavating, trenching, digging, boring, drilling, blasting, or concreting, the installation of any machinery or plant, and any work or undertaking in connection with a project".

.10 *Consultant* – Owner's representative for work associated with asbestos abatement work.

.11 *Contractor* – Contractor or sub-contractor undertaking the asbestos abatement work and holding the Notice of Project.

.12 *Friable Material* – a material that when dry, can be crumbled, pulverized or powdered by hand pressure, or is crumbled, pulverized or powdered.

.13 Glove Bag – a flexible PVC bag with inward projecting long-sleeve gloves that provides a temporary enclosure for the removal of asbestos pipe insulation.

.14 *HEPA Filter* - a high efficiency particulate aerosol filter capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

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.15 *HEPA Integrity Test (or DOP test)* – a method to test HEPA filters installed in vacuums and negative pressure units for leaks. The testing must be completed in conformance with current industry standards of practice.

.16 *Inspector* – Owner's authorized representative (i.e. Consultant) to ensure work is undertaken in accordance with the Contract requirements.

.17 *Lock-down sealant* – compound used to "lock-down" microscopic residual asbestos fibers present after the removal of asbestos containing materials.

.18 *Negative Air* - a term used to refer to the system of air filtration used for controlling airborne asbestos at asbestos removal projects through the maintenance of lower air pressure on the inside of an enclosure than exists on the outside

.19 *Non-friable Material* - a material that cannot be crumbled, pulverized or powdered by hand pressure.

.20 *Occupied Area* – an area outside of the asbestos abatement Work Area.

.21 *Owner* - defined by the Act as including a "trustee, receiver, mortgagee in possession, tenant, lessee, or occupier of any lands or premises used or to be used as a workplace, and a person who acts for or on behalf of an owner as an agent or delegate".

.22 *PCM* – Phase Contract Microscopy

.23 *Polyethylene* - polyethylene sheeting or rip-proof polyethylene sheeting used to construct that abatement enclosure to isolate Occupied areas of the building from the asbestos Work Area or for the protection of materials.

.24 *Presumed Asbestos-Containing Materials (PACM)*: Materials assumed to contain asbestos based on their composition, age, appearance, location or other available information, but not confirmed through laboratory analysis. Such materials shall be treated as asbestos-containing unless demonstrated otherwise through appropriate sampling and analysis, in accordance with O. Reg. 278/05 and as specified herein.

.25 *Sprayer* - garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray.

.26 *Supervisor* – person in charge of the workplace or authority over a worker.

.27 *Suspect Asbestos-Containing Materials (SACM)*: Materials potentially containing asbestos that were not identified during the assessment but may be uncovered during renovation or demolition. Such materials shall be presumed asbestos-containing unless laboratory analysis confirms otherwise.

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.28 *TEM (Transmission Electron Microscopy)* - An analytical method used to identify and quantify asbestos fibres in air or bulk material samples through high-resolution electron microscopy. TEM allows for the detection of very fine asbestos fibres and the identification of asbestos mineral types based on their physical and chemical characteristics.

.29 *Visitors* – Engineer, Contractor, Consultant or other designated representatives of the Owner and representatives of Regulatory agencies.

1.4 Existing Conditions

.1 Refer to Item 1.4 of Section 02 82 00.03.

1.5 General Requirements

.1 Refer to Item 1.5 of Section 02 82 00.03.

1.6 Description of Work

.1 Refer to Item 1.6 of Section 02 82 00.03.

1.7 Schedule

.1 Refer to Item 1.7 of Section 02 82 00.03.

1.8 Submittals

.1 Refer to Item 1.8 of Section 02 82 00.03.

1.9 Instruction and Training

.1 Provide instruction and training to all workers on the hazards of asbestos exposure, personal hygiene and work practices, and in the use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at a minimum:

.1 Fitting of equipment

.2 Inspection and maintenance of equipment

.3 Disinfecting of equipment

.4 Limitations of equipment

.3 Glove bag procedures including details of the specified work of this section.

.4 Operational procedures including:

.1 Preparation of the Work Area

.2 Dust control

.3 Personal protective clothing and equipment

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.4 Clean-up of the Work Area and waste removal

.5 First Aid training in accordance with the OHSA.

.6 Instruction and training must be provided by a competent, qualified person.

1.10 Worker Protection

.1 Only persons wearing protective clothing and equipment (i.e. respirators) may enter a Work Area where there is an asbestos dust hazard.

.2 Requirements for the use of protective clothing are as follows:

.1 Be made of a material that does not readily retain or permit penetration of asbestos fibres.

.2 Consist of head covering and full body covering that fits snugly at the ankles, wrists and neck to prevent asbestos fibres from reaching the garments and skin under the protective clothing.

.3 Must include suitable footwear.

.4 Must be repaired or replaced if torn.

.5 Must be decontaminated by damp wiping or HEPA vacuuming before leaving the Work Area

.3 Requirements for the use of respirators are as follows:

.1 Every worker who will enter the Work Area must don a NIOSH approved respirator in accordance with Table 2 of O. Reg. 278/05.

.2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters must be provided to workers.

.3 Written procedures must be in place for the selection, care and use of respirators. A copy of the procedures must be given to and reviewed with each worker who is required to wear a respirator.

.4 A worker must not be assigned to do work requiring the use of a respirator unless the worker is physically able to do the work while wearing the respirator.

.5 Respirators must be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is a hood or helmet type.

.6 Respirators must be assigned to a worker for his or her exclusive use, if practical.

.7 Respirators must be used and maintained in accordance with written procedures that are consistent with the manufacturer's specifications.

.8 Replace filters as necessary in accordance with manufacturer’s instructions.

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.9 Respirators that are assigned to one worker must be cleaned, disinfected and inspected at least after use on each shift.

.10 Respirators that are used by more than one worker must be cleaned, disinfected and inspected after each use.

.11 Damaged or deteriorated respirator parts must be replaced before the respirator is used by a worker.

.12 Respirators must be stored in a convenient, clean and sanitary location when not in use.

.13 Workers must receive training in the use, cleaning and disposal of respirators and protective clothing.

.14 The respirator training must include the limitations of the equipment, inspection and maintenance, proper fitting and cleaning and disinfection.

.15 All workers donning a respirator must be fit tested for that respirator. Fit testing must be provided by a competent person.

.4 Requirements for other personal protective equipment are as follows:

.1 Hard hats, safety shoes, safety glasses and protective gloves should be won by workers in accordance with construction safety regulations.

.5 Other safety measures to be followed include:

.1 Eating, drinking, chewing or smoking must not be permitted in the Work Area.

.2 Workers must dispose of protective clothing as contaminated waste before leaving the Asbestos Work Area.

.3 Ensure workers wash hands and face with soap and water when leaving the Asbestos Work Area. Facilities for washing must be located outside the Work Area.

1.11 Visitor Protection

.1 Refer to Item 1.13 of Section 02 82 00.03.

1.12 Supervision

.1 Refer to Item 1.14 of Section 02 82 00.03.

1.13 Notification

.1 Inform all sub-trades of the presence of asbestos-containing materials as identified herein.

.2 Submit to the Owner and Consultant a copy of all notifications prior to the start of work.

.3 Notify disposal site in advance of delivery of asbestos waste in accordance with the requirements of the Waste Management Regulation (O. Reg. 347/90).

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.4 Notify Ministry of Labour Notice of Project form if more than 1 square metre of friable insulation will be removed in accordance with O. Reg. 278/05.

.5 Notify the Consultant, Owner and Joint Occupational Health and Safety Committee and the Ministry of Labour if friable materials suspected of containing asbestos that was not previously identified become uncovered as required in O. Reg. 278/05.

1.14 Insurance

.1 Refer to Item 1.16 of Section 02 82 00.03.

1.15 Inspection

.1 Inspections of the Asbestos Work Area may be undertaken by the Consultant:

.1 At any time during abatement and/or cleanup activities with or without prior notice.

.2 Within or around the abatement Work Area.

.2 Milestone inspections may include any or all of the following:

.1 Pre-abatement Inspection – to inspect the setup of containment. Contractor not to proceed with contaminated work until written authorization is provided by the Consultant.

.2 Bulk or Spot Inspection – to inspect active asbestos removal activities.

.3 Final Inspection – to verify the scope of abatement work has been completed in accordance with Contract documents and that the Work Area is visibly clean and free of dust and debris. Contractor not to proceed with the application of the lock-down agent until written authorization is provided by the Consultant. If clearance air monitoring is required, it will be undertaken only after the Work Area has passed this final inspection.

.3 Consultant engaged by the Owner to perform inspections and air monitoring is authorized to identify deficiencies in the asbestos work and provide site instructions to ensure compliance with Contract requirements.

.4 Failure to pass the inspections noted above may require the Contractor to expend additional resources to provide satisfactory performance at no additional charge to the Owner. The Consultant is empowered by the Owner to inspect for final cleanliness at completion.

.5 The Contractor will incur the cost of the Consultant's site visit should the Contractor not be ready for a scheduled milestone inspection by the Consultant.

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

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.7 Additional inspections or air monitoring that may be required as a result of the Contractor's failure to perform the work satisfactorily may result in back charges to the Contractor at the Owner's discretion.

1.16 Air Monitoring

.1 Air monitoring may be undertaken by the Consultant:

.1 At any time during abatement and/or cleanup activities.

.2 From inside and/or outside of the asbestos abatement Work Area.

.3 On workers engaged in abatement and/or cleaning activities to ensure respiratory safety factors are not exceeded.

.2 Air monitoring will be undertaken following NIOSH Method 7400, ASBESTOS and OTHER FIBERS by PCM (Phase Contrast Microscopy).

.3 If air monitoring results indicate areas outside of the Asbestos Work Area/enclosure (i.e. Occupied space) are in excess of 0.05 fibres per millilitre of air (fibre/mL), the following measures are to be implemented by the Contractor:

.1 Stop work within the Asbestos Work Area.

.2 Notify Owner and Consultant who are to investigate the concern.

.3 Work is not to resume until written authorization is provided by the Consultant.

.4 Isolate and clean the contaminated area following Type 2 cleanup measures (no enclosure).

.5 Maintain isolation of the impacted area and repeat cleaning efforts until results of visual inspection and subsequent air monitoring are found to be acceptable by the Consultant.

.6 Implement other measures as directed by the Consultant to remedy the situation. These may include the installation of negative air units within the impacted area.

.4 If air monitoring results within the Asbestos Work Area are in excess of the respirator protection factor, the following measures are to be implemented by the Contractor:

.1 Stop work within the Asbestos Work Area.

.2 Workers must exit the Asbestos Work Area via the decontamination facility.

.3 Consultant should be notified and the area not re-entered until measures are taken to resolve the issue – workers are not permitted to re-enter until advised by the Consultant in writing.

.5 Costs associated with additional inspections and air monitoring due to deficiencies in the maintenance of the Asbestos Work Area resulting in elevated asbestos fibre levels inside or outside the Work Area may be charged back to the Contractor at the discretion of the Owner.

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PART 2 PRODUCTS

2.1 Materials and Equipment

.1 General Materials

.1 *Amended Water* - water containing a surfactant to reduce water surface tension. Surfactant added at a concentration to provide penetration and wetting of asbestos fibres.

.2 *Glove Bag* – that is equipped with the following:

.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

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

.3 *Lock-Down Sealer* - non-staining, clear, water-dispersible material that is designed for the purpose of trapping residual asbestos fibres. The sealer should remain tacky on surface for at least 8 hours and shall have flame spread and smoke developed rating both less than 50.

.4 *Polyethylene* – minimum 6 mil (0.15 mm) thick unless otherwise specified; in sheet size to minimize joints.

.5 *FR Polyethylene* - minimum 6 mil (0.15 mm) thick, woven fibre reinforced fabric bonded both sides with polyethylene.

.6 *Tape* - fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

.7 *Plastic Bags* - minimum 6 mil (0.15 mm) thick sheet polyethylene. Bag seams shall be sufficiently strong to resist pressure and shocks that occur under normal conditions of transport.

.8 *Drums* - sturdy non-reusable, steel, aluminum, or plastic, with tight-fitting lids acceptable to the Ontario Ministry of Environment and waste disposal facility.

.9 *Asbestos Waste Containers* - contain waste in two separate containers. The inner container shall be a 6 mil (0.15 mm) thick sealable polyethylene bag. Outer container shall be a sealable metal or fibre type where there are sharp objects included in the

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waste material; otherwise the outer container may be sealable metal or fibre type or a second 6 mil (0.15 mm) thick sealable polyethylene bag. Containers should be labelled as prescribed in O. Reg. 347/90 and O. Reg. 278/05.

.10 *Duct Tape* - Good quality, water resistant plastic type.

.11 *Protective Clothing* – shall be provided by the employer and worn by every worker who enters the Work Area. The protective clothing,

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

.2 shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing,

.3 shall include suitable footwear, and

.4 shall be repaired or replaced if torn.

.2 Equipment

.1 Vacuums - HEPA filtered wet/dry type with accessories adequate to perform removal and cleanup work or to provide negative pressure in smaller Work Areas.

.3 Warning Signage

.1 Provide warning signs to convey the following:

.1 Caution Asbestos Dust Hazard

.2 Work area is restricted to persons wearing protective clothing and equipment

.3 Breathing asbestos dust may cause serious bodily harm

.4 Entry is prohibited except to authorized persons.

.5 Drinking, eating and smoking are prohibited in this area.

.2 Place placards on vehicles transporting asbestos waste in accordance with Transportation of Dangerous Goods Act.

PART 3 EXECUTION

3.1 Project Requirements

.1 Comply with the following requirements when performing glove bag operations within the Work Area.

.1 A glove bag shall not be used to remove insulation from a pipe, duct or similar structure if it may not be possible to maintain a proper seal for any reason including

.1 the condition of the insulation

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.2 the temperature of the pipe, duct or similar structure

.2 or if the bag could become damaged for any reason including

.1 the type of jacketing

.2 the temperature of the pipe, duct or similar structure.

3.2 HVAC System Isolation

.1 Shut down HVAC system to Asbestos Work Area for the duration of the abatement work. Maintain operation of the HVAC system to other parts of the building – do not disrupt HVAC to other areas of the building.

.2 Seal openings to HVAC system to prevent asbestos fibres from entering system.

.3 Where the system cannot remain shut down, temporarily shut it down to cut, hard-cap and seal ductwork at the Work Area boundaries, allowing continued operation in unaffected areas.

3.3 Electrical System Isolation

.1 Isolate electrical systems which will remain energized in the Asbestos Work Area, with ground fault interrupters, otherwise disconnect existing power supply to the Asbestos Work Area. Power to other areas of the building must not be disrupted.

.2 Use only ground fault protected electrical services of sufficient capacity for electrical equipment used in the Asbestos Work Area.

.3 Ensure all openings on electrical equipment are water and dust resistant.

.4 Electrical panels are to be inspected by the Electrical Safety Authority and

.5 Only CSA approved parts are to be used.

.6 Licenced electrician to install and inspect protection systems.

3.4 Preparation of Asbestos Abatement Work Area

.1 Isolate Asbestos Work Area from remainder of building using caution tape along with signage warning of asbestos hazard.

.2 Post Notice of Project.

.3 Pre-clean the Work Area by HEPA vacuuming and/or wet wiping surfaces within the Work Area following Type 2 clean-up procedures.

.4 Seal off openings in the perimeter including, but, not limited to, the following:

.1 Heating and ventilation grills and outlets.

.2 Doorways.

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.3 Elevator shafts.

.4 Corridors.

.5 Openings for lighting and electrical systems.

.6 Ceiling and floor openings above and below Work Area, including plumbing and conduit chases.

.5 Shutdown HVAC supply and return serving the Work Area.

.6 Seal HVAC supply and return air louvres and grilles with polyethylene sheeting to prevent contamination of the system.

.7 Install one layer of rip-proof polyethylene sheeting overtop 6 mil sheeting to protect floors beneath and adjacent to the Work Area.

.8 Cover adjacent finishes with 6 mil polyethylene sheeting as may be required for protection.

3.5 Maintenance of Asbestos Work Area

.1 Inspect the condition of the Work Area, glove bags and equipment on regular intervals.

.2 Inspect all HEPA filtered vacuums at the start and end of each shift to ensure:

.1 equipment is operating according to manufacturers' specifications.

.2 HEPA filters are in good condition, not overloaded and are replaced as needed.

.3 Exterior of waste bags should be cleaned using HEPA vacuum and/or damp wiping then placed into a second clean waste bag, sealed then immediately removed from the Asbestos Work Area.

.4 Asbestos waste should be removed from site, transported and disposed of in accordance with all Federal, Provincial and local regulatory requirements.

.5 Once asbestos-containing materials have been fully removed, thoroughly clean the Work Area and adjacent areas using HEPA vacuum and/or damp wiping.

3.6 Procedures

.1 <u>Setup of the Abatement Work Area</u>

.1 Undertake pre-removal survey for damage.

.2 Remove non-fixed items from the Work Area and store as directed by the Owner.

.3 Shutdown and isolate HVAC system within the Work Area. Maintain HVAC system to other parts of the building.

.4 Seal all openings or voids, including ventilation ducts to and from the Work Area.

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.5 Post warning signs in English and French at all access points to the Asbestos Work Area in large clearly visible letters warning of an asbestos dust hazard and that access to the area is restricted to persons wearing protective clothing and equipment.

.6 Follow Type 2 cleaning operations to pre-clean the Asbestos Work Area prior to the start of any abatement work. Using HEPA vacuum or damp cloths (where damp cleaning does not create a hazard), remove visible dust and debris from surfaces within the Work Area. Do not use compressed air to clean up or remove dust from surfaces.

.7 Maintain emergency and fire exits.

.8 Isolate electrical system.

.9 Asbestos removal may not commence until the Work Area setup has been inspected by the Consultant and authorization to proceed with removal activities is given in writing.

.2 Asbestos Removal - General

.1 Supply amended water for the wetting of materials to be removed.

.2 Remove asbestos-containing materials as specified for the particular material being abated.

.3 Cleanup waste on a regular basis.

.4 Place waste in asbestos appropriate containers in accordance with requirements of this section.

.5 All waste bins must be covered and secured with a lock when waste bin is not being used.

.6 Do not re-use the glove bag unless it is designed to be moved (e.g. Safe-T-Strip).

.3 Glove Bag Removal Procedure

.1 The Work Area is to be separated from the rest of the workplace by walls, barricades, caution tape or other suitable means.

.2 Install 6 mil polyethylene sheeting on surfaces below the Work Area.

.3 The glove bag shall be made of material that is impervious to asbestos and sufficiently strong to support the weight of material the bag will hold.

.4 Immediately before the glove bag is attached, the insulation jacketing or coating is to be inspected for damage or defects and repaired.

.5 Inspect the glove bag for damage or defects prior to use and at regular intervals during its use. Damaged glove bags should be disposed of.

.6 If the glove bag is damaged during use,

.1 discontinue using the glove bag

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.2 thoroughly wet the inner surface of the glove bag and the contents

.3 place the glove bag and the contents in an asbestos waste container

.4 HEPA vacuum and/or wet wipe the Work Area prior to resuming work.

.7 Install drop sheet beneath Work Area prior to commencing work.

.8 Install glove bag over pipe insulation in accordance with manufacturer's requirements.

.9 Follow manufacturer's instructions for the removal of insulation. Ensure the volume and weight limitations of the glove bag are not exceeded.

.10 When the removal work is completed,

.1 the inner surface of the glove bag and the waste inside should be thoroughly wetted and the air inside the bag removed through an elasticized valve, by means of a vacuum equipped with a HEPA filter.

.2 the pipe from which the insulation was removed should be wet wiped and all surfaces treated with the lock-down agent.

.3 place the glove bag, with the waste inside into an asbestos waste container.

3.7 Dismantling and Cleanup of the Abatement Work Area

.1 Upon completion of asbestos abatement work, perform the following:

.1 Wet wipe or HEPA vacuum all tools and equipment prior to removal from the Asbestos Work Area.

.2 Clean all polyethylene surfaces by wet wiping or HEPA vacuuming prior to removal.

.3 Remove polyethylene wall sheets by carefully folding sheets with asbestos exposed side folded in. Dispose of as asbestos waste.

.4 Clean any debris left behind during dismantling procedures by wet wiping and/or HEPA vacuuming surfaces within the Work Area.

.5 Remove other materials from site.

.6 All HEPA filters taken out of service are to be disposed of as asbestos waste.

.7 Seal all inlet and exhaust openings on vacuums when units are shut down.

.8 Re-establish items removed from the Work Area.

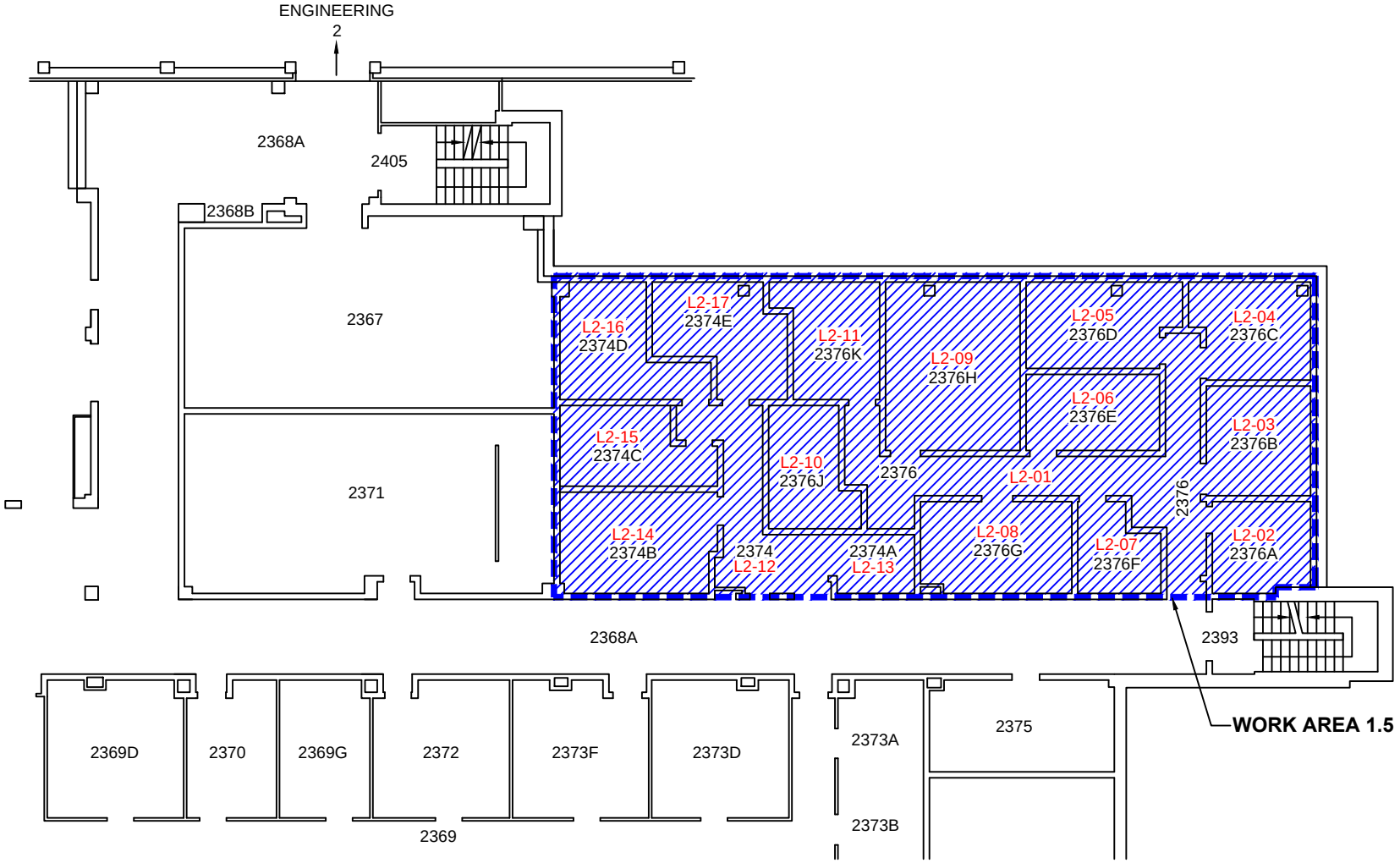
.9 Restore HVAC system to the Work Area including removal of capped ducts (if applicable) and all seals.

.10 Vacuum Work Area and ensure the workspace is clean prior to demobilizing.

END OF SECTION

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SECOND FLOOR (PARTIAL)

LEGEND

L# LOCATION IDs

WORK AREA 1.5

NOTES: **1. REFER TO THE REPORT & SPECIFICATIONS FOR INFORMATION ON DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS PRESENT WITHIN THE WORK AREAS.**
2. DRAWING CONTAINS COLOURED ELEMENTS THAT MAY NOT BE VISIBLE ON BLACK AND WHITE COPIES.
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ASBESTOS ABATEMENT WORK AREAS

CARL A. POLLOCK HALL (CPH), BUILDING 29, 200 UNIVERSITY AVENUE WEST, WATERLOO, ONTARIO
THIRD AND FOURTH FLOOR REFRESH WR53073

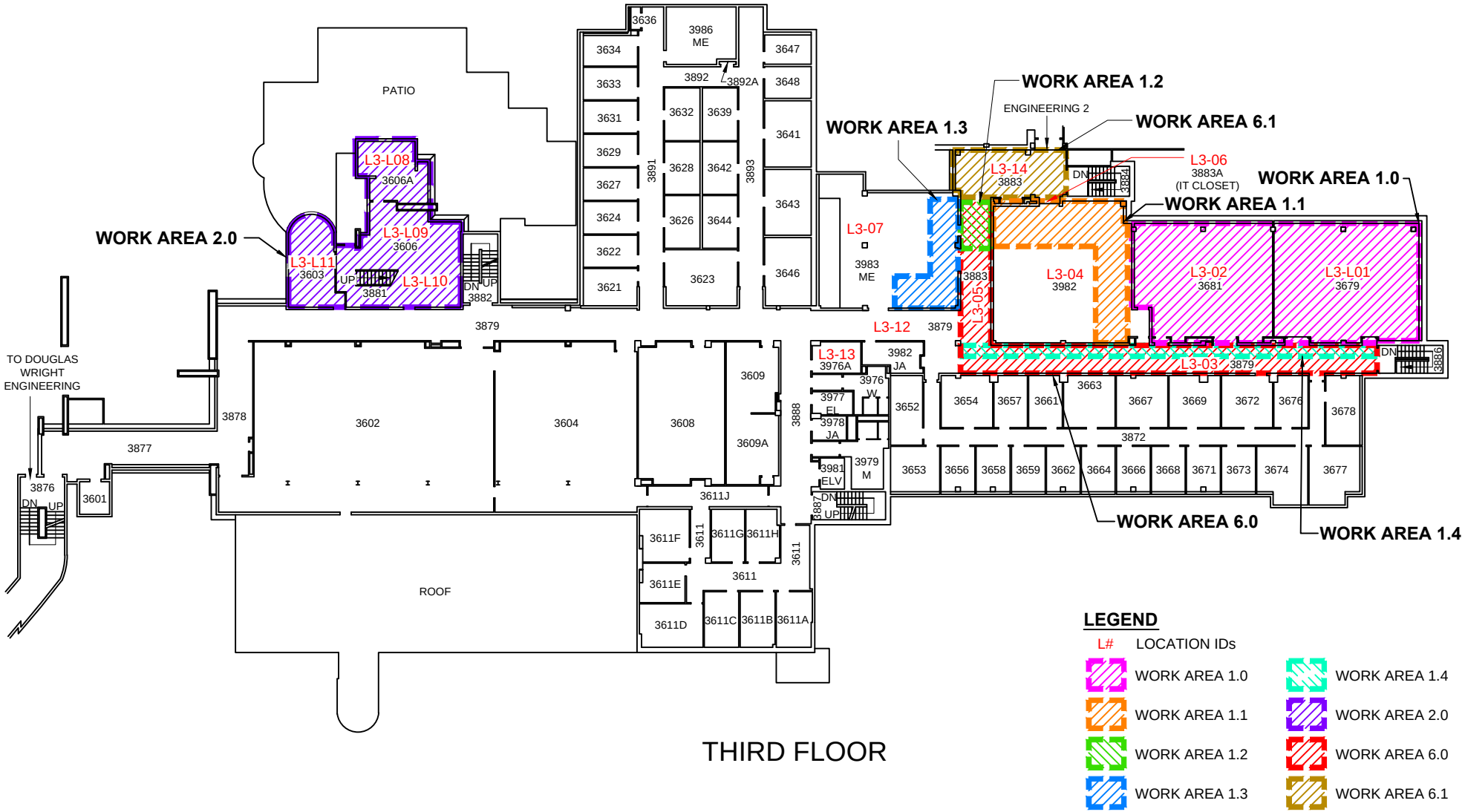
Client: UNIVERSITY OF WATERLOO, GENERAL SERVICES COMPLEX, 200 UNIVERSITY AVENUE WEST, WATERLOO, ONTARIO N2L 3G1

Project No.:	10107.227
Scale:	N.T.S.
Date:	26/10/29
Dwn. By:	CD AC2026100024 CS/OK
App'd By:	NN

Dwg. No.: 1

Access

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THIRD FLOOR

LEGEND

L# LOCATION IDs

- WORK AREA 1.0
- WORK AREA 1.1
- WORK AREA 1.2
- WORK AREA 1.3
- WORK AREA 1.4
- WORK AREA 2.0
- WORK AREA 6.0
- WORK AREA 6.1

NOTES: **1. REFER TO THE REPORT & SPECIFICATIONS FOR INFORMATION ON DESIGNATED SUBSTANCES AND HAZARDOUS BUILDING MATERIALS PRESENT WITHIN THE WORK AREAS.**
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ASBESTOS ABATEMENT WORK AREAS

CARL A. POLLOCK HALL (CPH), BUILDING 29, 200 UNIVERSITY AVENUE WEST, WATERLOO, ONTARIO
THIRD AND FOURTH FLOOR REFRESH WR53073

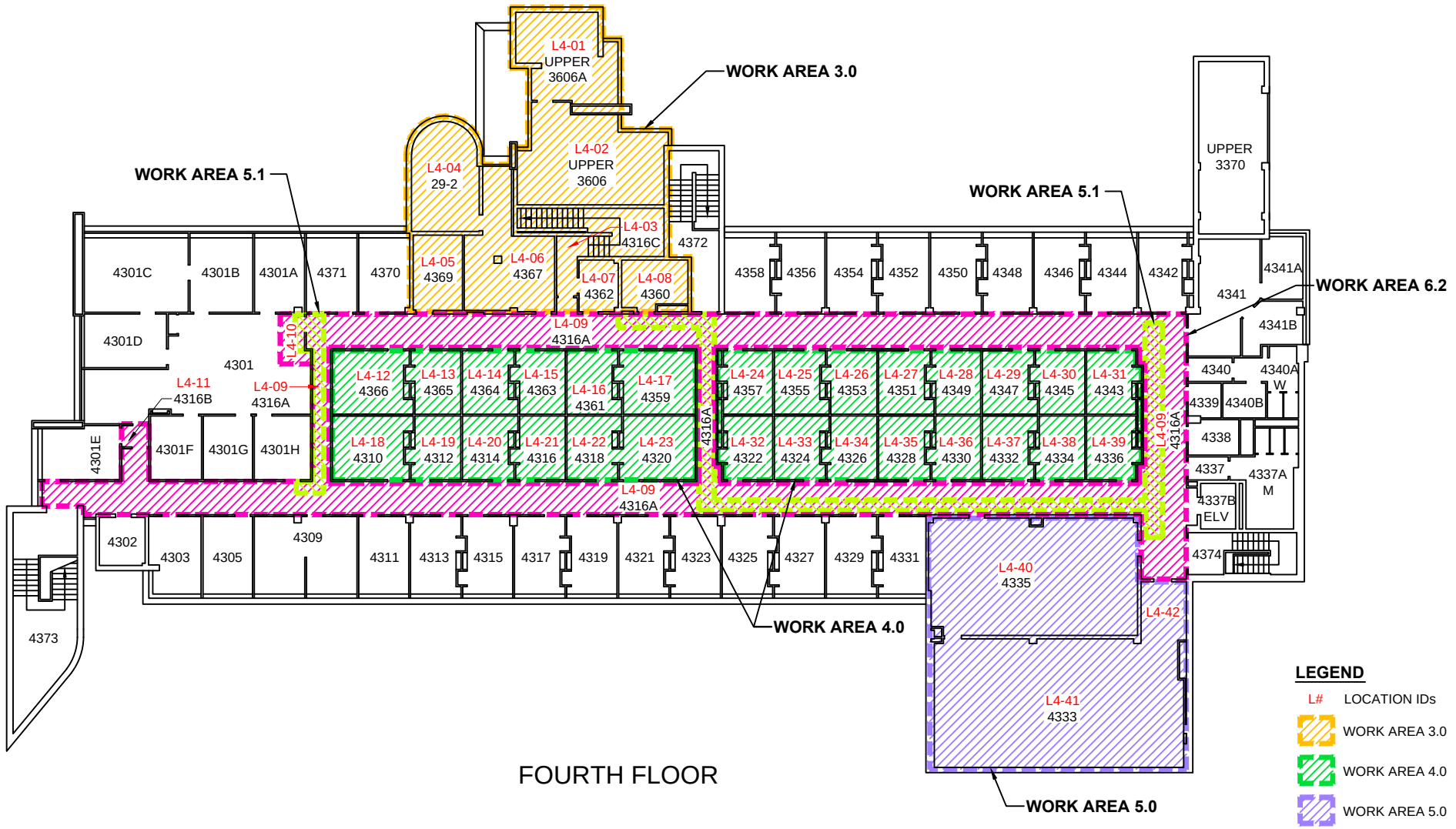
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Project No.:	10107.227
Scale:	N.T.S.
Date:	26/10/29
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App'd By:	NN

Dwg. No.: 2

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ASBESTOS ABATEMENT WORK AREAS

CARL A. POLLOCK HALL (CPH), BUILDING 29, 200 UNIVERSITY AVENUE WEST, WATERLOO, ONTARIO
THIRD AND FOURTH FLOOR REFRESH WR53073

Client: UNIVERSITY OF WATERLOO, GENERAL SERVICES COMPLEX, 200 UNIVERSITY AVENUE WEST, WATERLOO, ONTARIO N2L 3G1

Project No.:	10107.227
Scale:	N.T.S.
Date:	26/10/29
Dwn. By:	CD AC2026100026 CS/OK
App'd By:	NN

Dwg. No.: 3

Access

TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
SECOND FLOOR					
2374	Hallway	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
2374A	Foot Bath	Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
2374B	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
2374C	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM

ACM - ASBESTOS-CONTAINING MATERIAL
BCM - BUILDING COMPONENT OR MATERIAL

TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
2374D	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
2374E	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
2376	Hallway	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
2376A	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM

ACM - ASBESTOS-CONTAINING MATERIAL
BCM - BUILDING COMPONENT OR MATERIAL

TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
2376B	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
2376C	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
2376D	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
2376E	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Vinyl Sheet Floor	Blue	-	Non ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
2376F	Kitchenette	Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Ceramic Tile	-	-	Non ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
2376G	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
2376H	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
2376J	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-3)	Interior demising walls, renovated 2007/2008	31	Non ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
2376K	Office	Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-15)	2' x 4' Medium Fissure, Random Pinhole	59	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
THIRD FLOOR					
3603	Office	Carpet	-		-
		Brick	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-9)	2' x 2' Short Fissure, Pinhole, drop style	53	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
3606	Office	Carpet	-	-	-
		Brick	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-8)	2' x 2' Short Fissure, Pinhole	52	Non ACM
		Suspended Ceiling Tile (SCT-9)	2' x 2' Short Fissure, Pinhole, drop style	53	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Foam	66	Non ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
3606A	Office	Carpet	-	-	-
		Brick	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-8)	2' x 2' Short Fissure, Pinhole	52	Non ACM
		Suspended Ceiling Tile (SCT-9)	2' x 2' Short Fissure, Pinhole, drop style	53	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
		Thermal Systems Insulation (Pipe Straights & Fittings)	Foam	66	Non ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
3679	Classroom	Vinyl Floor Tile (VFT-1)	12" x 12" Beige w/ green streak	11	ACM
		Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Suspended Ceiling Tile (SCT-4)	2' x 4' Width-Wise Fissure, Random Pinhole	48	Non ACM
		Suspended Ceiling Tile (SCT-5)	2' x 4' Rough Texture, Random Pinhole	49	PACM
		Sprayed Firproofing (SP-1)	Grey	1	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
3681	Lab	Vinyl Sheet Floor (VSF-1)	Off-white	16	Non ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Drywall Joint-Fill Compound (DJFC-2)	Present at rear alcove entrance area to Room 3681	30	Non ACM
		Block Wall Primer	-	28	ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Suspended Ceiling Tile (SCT-1)	2' x 2' Deep Width-Wise Fissure, Random Pinhole, Dark Backing	45	Non ACM
		Suspended Ceiling Tile (SCT-2)	2' x 2' Deep Width-Wise Fissure, Random Pinhole, Light Backing	46	Non ACM
		Sprayed Fireproofing (SP-1)	Grey	1	Non ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
3982	Lab	Vinyl Floor Tile (VFT-1)	12" x 12" Beige w/ green streak	12	ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Sprayed Fireproofing (SP-1)	Grey	1	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Pipe Insulation (CWR & CWS)	White	75	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
		Vinyl Floor Tile (VFT-1)	12" x 12" Beige w/ green streak	12	ACM
		Block Wall Primer	-	28	ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
3879	Corridor	Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Suspended Ceiling Tile (SCT-5)	2' x 4' Rough Texture, Random Pinhole	49	PACM
		Suspended Ceiling Tile (SCT-6)	2' x 4' Small Fissure, Random Pinhole	50	Non ACM
		Sprayed Fireproofing (SP-1)	Grey	1	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Parging Cement Fittings	Grey Insulation	64	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
3879 (renovated section L3-12)	Corridor (renovated section L3-12)	Vinyl Sheet Flooring (VSF-2)	White (renovated portion of corridor)	17	Non ACM
		Suspended Ceiling Tile (SCT-16)	2' x 4' Small Deep Fissure, Random Pinhole (new reno)	71	Non ACM
		Sprayed Fireproofing (SP-5)	Beige, New Installation 2019/2020	72	Non ACM
		Block Wall Primer	-	28	ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
3881	Staircase	Carpet	-	-	-
		Brick	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-8)	2' x 2' Short Fissure, Pinhole	52	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
3883	Corridor	Vinyl Floor Tile (VFT-1)	12" x 12" Beige w/ green streak	11	ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-7)	2' x 4' Width-Wise Fissure, Random Pinhole	51	Non ACM
		Metal Pan	Metal Pan	23	Non ACM
		Sprayed Fireproofing (SP-2)	White, Grey	2	ACM
		Sprayed Fireproofing Debris (Ceiling Space)	Various	6	ACM
		Pipe Insulation (CWR & CWS)	White	74	Non ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
3883A	IT Closet	Vinyl Floor Tile (VFT-1)	12" x 12" Beige w/ green streak	11	ACM
		Sprayed Fireproofing (SP-2)	White, Grey	2	ACM
3976A	IT Room	Block Wall Primer	-	28	ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Vinyl Sheet Flooring (VSF-2)	White (renovated)	17	Non ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
		Sprayed Fireproofing (SP-5)	Beige, New Installation 2019/2020	72	Non ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
3983	Mechanical Room	Block Wall Primer	-	28	ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Sprayed Fireproofing (SP-2)	White, Grey	2	ACM
		Sprayed Fireproofing Debris	Various	6	ACM
		Parging Cement Fittings	Grey	64	ACM
		Pipe Insulation (CWR & CWS)	Green	73	Non ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
FOURTH FLOOR					
4301	Dept of Engineering Admin Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-11)	2' x 4' Width-Wise Fissure, Random Pinhole	55	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4310	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4312	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4314	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole, 2 tiles	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4316	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4316A	Corridor	Vinyl Floor Tile (VFT-2) & Mastic	12" x 12" White	12	ACM
		Vinyl Floor Tile (VFT-1)	12" x 12" Beige w/ green streak	11	ACM
		Vinyl Floor Tile (VFT-3)	12" x 12" Brown, beige	13	PACM
		Block Wall Primer	-	28	ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-11)	2' x 4' Width-Wise Fissure, Random Pinhole	55	Non ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Sprayed Fireproofing (SP-1)	Grey (South end of Corridor)	1	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Sprayed Fireproofing Overspray (SP-6)	Off-White (North end of Corridor)	76	ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4316B	Vestibule Area	Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-11)	2' x 4' Width-Wise Fissure, Random Pinhole	55	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4316C	Corridor	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Brick	-	-	-
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-8)	2' x 2' Short Fissure, Pinhole	52	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4318	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4320	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4322	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4324	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4326	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4328	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4330	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
4330	Office	Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4332	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4333	Classroom	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound (portion at L4-42)	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-14)	2' x 4' Small Round Fissure, Random Pinhole	58	Non ACM
		Firespray (SP-4)	Beige	4	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board (portion at L4-42)	7	Non ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4334	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4335	Computer Lab	Carpet	-	-	-
		Residual Mastic	Yellow, Black	26	ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-14)	2' x 4' Small Round Fissure, Random Pinhole	58	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4336	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM

ACM - ASBESTOS-CONTAINING MATERIAL
BCM - BUILDING COMPONENT OR MATERIAL

TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4343	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4345	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4347	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4349	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4351	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4353	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4355	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM

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BCM - BUILDING COMPONENT OR MATERIAL

TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4357	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4359	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-13)	2' x 4' Width-Wise Shallow Fissure, Random Pinhole	57	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4360	IT Room	Vinyl Floor Tile (VFT-1)	12" x 12" Beige w/ green streak	11	ACM
		Block Wall Primer	-	28	ACM
		Suspended Ceiling Tile (SCT-11)	2' x 4' Width-Wise Fissure, Random Pinhole	55	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4361	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4362	Kitchenette	Vinyl Sheet Flooring (VSF-3)	Brown, Blue	18	Non ACM
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-8)	2' x 2' Short Fissure, Pinhole	52	Non ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-2)	Light Grey, White	77	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies (residual asbestos sprayed fireproofing may be concealed)	5	ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4363	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM

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TABLE 1 - ROOM-BY-ROOM SUMMARY

ROOM #	ROOM NAME	BUILDING MATERIAL	MATERIAL DESCRIPTION	BCM #	Asbestos Classification
4364	Office	Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole	47	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4365	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-12)	2' x 4' Short Random Fissure, Random Pinhole	56	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4366	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-3)	2' x 4' Large & Small Patterned Pinhole, 2 tiles	47	ACM
		Suspended Ceiling Tile (SCT-14)	2' x 4' Small Round Fissure, Random Pinhole	58	Non ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
4367	Lounge	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-9)	2' x 2' Short Fissure, Pinhole, drop style	53	Non ACM
		Suspended Ceiling Tile (SCT-10)	2' x 4' Deep Small Random Fissure, Random Pinhole	54	Non ACM
		Block Wall Primer	-	28	ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Parging Cement Fittings	Grey	64	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
4369	Office	Carpet	-	-	-
		Drywall Joint-Fill Compound (DJFC-1)	Drywall Joint Compound	29	ACM
		Suspended Ceiling Tile (SCT-11)	2' x 4' Width-Wise Fissure, Random Pinhole	55	Non ACM
		Block Wall Primer	-	28	ACM
		Sprayed Fireproofing (SP-3)	Green Tint	3	Non ACM
		Sprayed Fireproofing Residual (SPR-1)	Varies	5	ACM
		Drywall Joint-Fill Compound (ceilings)	Fire separation - gypsum board	7	ACM
		Thermal Systems Insulation (Ducts)	Fibreglass	63	Non ACM
		Thermal Systems Insulation (Pipe Straights & Fittings)	Fibreglass	62	Non ACM
29-02 (Exterior)	Patio (off Room 4367)	Caulking & Sealant	Elastomeric coating & caulking	70	Non ACM

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