

Part 1 General

1.1 GENERAL AND RELATED WORK

- .1 It is the intent of the following Section to provide an outline of key requirements and work procedures for the safe handling, removal, enclosure, repair, or clean-up of any Hazardous Material identified under the Contract.
- .2 Related work specified elsewhere:
 - .1 Section 02 87 13.14 Mould Abatement – Level 2 Precautions
- .3 Site Conditions identifies the general location, condition, and quantity of known hazardous building materials within the Project Area. The information provided is for general reference only. The Contractor must confirm existing conditions and quantities on-site prior to tender close.
- .4 The specification fulfils the requirements of Section 30 of the Ontario Occupational Health and Safety Act.
- .5 Article 1.3 “Outline of Work” identifies the general location, condition, and quantities of hazardous building materials requiring handling, removal, enclosure, repair, or clean-up under the Contract.
- .6 Comply with the requirements of this Section during the handling, removal, enclosure, repair, or clean-up of any hazardous materials identified under Contract.

1.2 SITE CONDITIONS

- .1 Refer to Drawings MR-01 for the location of mould and water damaged materials within the Project Area.
- .2 Immediately stop work in the immediate area and notify the Abatement Consultant should unexpected material or materials suspect of containing or being contaminated by any hazardous material(s) be encountered. Do not resume work in the immediate area until it has been determined if the material encountered is a hazard and written authorization to resume work in the area has been issued by the Abatement Consultant.
- .3 Asbestos:
 - .1 Based on sampling and the age of the building, all building finishes impacted below do not contain asbestos.
- .4 Lead:
 - .1 Paint finishes throughout the building have been confirmed to contain insignificant concentrations of lead.
- .5 Mould:
 - .1 Mould growth and/or water damage is present as follows:
 - .1 On pipe insulation in the Basement Storage.
 - .2 On ceiling finishes in the Basement Storage.

- .6 Remaining designated substances including arsenic, acrylonitrile, benzene, coke oven emissions, ethylene oxide, isocyanates, vinyl chloride monomer, are not typically found in building materials in a composition/state that is hazardous and are not presumed to be present within the Project Areas.
- .7 General Building Conditions:
 - .1 Heat and smoke detectors to remain live throughout all phases of the work.
 - .2 Sprinklers to remain live throughout all phases of the work.
 - .3 Steam and condensate pipes to remain live throughout all areas of work.

1.3 **OUTLINE OF WORK**

- .1 Refer to applicable Section(s) identified under Article 1.1 General and Related Work for specified personnel protective measures for the safe handling, removal, enclosure, repair, or clean-up of hazardous materials required under Contract.
- .2 The City of Toronto will determine who is to provide and pay for site inspection and air monitoring services specified herein.
- .3 Visit the site prior to tender close to confirm the location and extent of any hazardous building materials or materials contaminated by hazardous materials.
- .4 Refer to information contained in the overall Tender Package (including the Project Manual and any Contract Drawings) for the extent of construction work required under Contract and an outline of the Project Area.
- .5 Refer to Drawings MR-01 for the extent of the Abatement Work Area.
- .6 Coordinate the following items with the City of Toronto, Project or Construction Manager, and Contractor including but not limited to: any service disconnects, isolation of any electrical, mechanical or communication systems, GFI and water connections, HVAC and exhaust ventilation system isolation, bin placement, project phasing, etc.
- .7 Coordinate, with the Abatement Consultant, City of Toronto, Project or Construction Manager, and Contractor, further investigation of the condition of any building materials behind appliances throughout the building.
- .8 Isolate the Abatement Work Area from adjoining Occupied Areas as specified, whether present at an interior or exterior location.
- .9 Maintain emergency and fire exits from Abatement Work Area or establish alternative exits satisfactory to Provincial Fire Marshall and local authorities having jurisdiction. Maintain extra routes from occupied areas. Place emergency exit signs at locations to clearly mark exit route. Seal emergency exit doors so as not to impede use of door during emergency evacuation.
- .10 Isolate or otherwise disable HVAC systems, vents and diffusers as specified to accommodate the work. System(s) isolated shall remain disabled until completion of work and final dismantlement of any perimeter barricades.
- .11 Where specified, isolate existing furnace(s), boiler(s), hot water tank(s) and any other gas-fired equipment or appliances, and in such a manner as to ensure the safe and uninterrupted use of this equipment. Provide sufficient combustion air to overcome the effect of negative pressure within each work enclosure.

- .12 Protect in place, using polyethylene sheeting, drop cloth, or other suitable means as specified, any remaining items, wall and/or floor finishes, etc.
- .13 Where specified, maintain each Abatement Work Area under negative pressure via the supply and continued operation of required number of HEPA filtered negative pressure units and/or vacuums.
- .14 Perform selective demolition of mechanical and electrical equipment, building components, materials and items scheduled for demolition at locations where such demolition activities will result in the disturbance of hazardous building materials or surfaces contaminated by hazardous building material. Refer to related sections of the Project Manual and any Contract Drawings for further clarification regarding which trades are responsible for any demolition work.
- .15 Maximize waste diversion by use of resale or recycling of any building materials or items scheduled for disposal but are not otherwise contaminated by any hazardous building materials.
- .16 It is the responsibility of the contractor to confirm all material quantities and to verify all site conditions to their satisfaction prior to bid submission. Extras to the contract, due to the quantity of any hazardous building materials present on-site, will not be accepted.
- .17 Proceed with the following abatement work while adhering to Level 2 Mould Precautions:
 - .1 Basement Storage (~80 sq.ft.):
 - .1 Remove and dispose of mouldy/water damaged ceiling finishes.
 - .2 Remove and dispose of water-stained pipe insulation.

1.4 SCHEDULE

- .1 Provide necessary manpower, supervision, equipment, and materials to maintain and complete the project on schedule.
- .2 Work Hours:
 - .1 Coordinate all work, scheduling, and phasing with the City of Toronto, Project or Construction Manager, and Contractor.
 - .2 Duration for which HVAC systems may remain shutdown to accommodate quiet hours work will change based on outside weather conditions and internal demand. Duration of quiet hours work will have to be scheduled accordingly and in consultation with the Abatement Consultant, City of Toronto, Project or Construction Manager, and Contractor.
- .3 Provide 48 hours written notice to the Abatement Consultant of any request to work outside normal working hours. Obtain written approval before proceeding.

1.5 DEFINITIONS

- .1 Abatement Consultant: City of Toronto's Representative providing inspection and air monitoring.
- .2 Abatement Contractor: Contractor or sub-contractor performing work of this Section.

- .3 Abatement Work Area: Area where work takes place which will, or may, disturb hazardous building materials including, but not necessarily limited to those materials or substances listed and/or referred to under Article 1.2 Site Conditions.
- .4 Airlock: Temporary chamber which permits ingress or egress from an Abatement Work Area without permitting air movement through to adjoining areas.
- .5 Authorized Visitors: City of Toronto or designated representative(s), Abatement Consultant, and persons representing regulatory agencies.
- .6 Competent Person: An individual who can demonstrate knowledge, training and experience in the specific field of hazardous materials abatement in which they are working and are capable of identifying existing hazards in the workplace and selecting appropriate control strategies to address conditions encountered.
- .7 Contaminated Waste: Material identified under Site Conditions, including fallen material, settled dust, other debris and materials or equipment deemed to be contaminated by the Abatement Consultant.
- .8 Curtained Doorway: Doorway consisting of two (2) overlapping flaps of rip-proof polyethylene arranged to permit ingress and egress from one room to another while permitting minimal air movement between rooms.
- .9 DOP Test: A testing method used to determine the integrity of the Negative Pressure Unit or vacuum using a Dispersed Oil Particulate (DOP) or Poly Alpha Olefin (PAO) HEPA filter leak test. This test is to be conducted on-site where units are to be installed. Refer to the Environmental Abatement Council of Ontario (EACO) DOP/PAO Testing Guideline 2013 or ANSI/ASME N510-2007.
- .10 HEPA Filter: High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.
- .11 HVAC: Heating ventilating and air-conditioning system(s) which serve occupied and/or unoccupied areas of the facility. Includes but is not limited to air handling units, associated duct work, terminal boxes, and vents.
- .12 Milestone Inspection: Inspection of the Abatement Work Area at a defined point in the abatement operation.
- .13 Mould-Contaminated Material (MCM): Any substance, product, material, or piece of equipment found to be or have supported mould growth or is otherwise contaminated by mould, as identified through visual inspection or laboratory analysis.
- .14 Mould Waste: Waste generated during the handling, removal, or clean-up of any mould-containing material or any material or item contaminated by mould.
- .15 Mould Work Area: Any area or location where work takes place that may results in the disturbance of building materials or finishes known or suspect of being contaminated by mould.

- .16 Negative Pressure: A reduced pressure within the Abatement Work Area (> 5 Pa) of water column) established by extracting air directly from Abatement Work Area and discharging it to exterior of building. Volume of air extracted must be sufficient to provide a minimum of one air change every 20 minutes during wet removal, and once every 15 minutes during dry removal, while ensuring that at all times, air movement flows into the Abatement Work Area, as determined by visual or smoke testing to the satisfaction of the Abatement Consultant.
- .17 Occupied Area: Includes any area of the building or adjoining space outside the Abatement Work Area.
- .18 Personnel: All Contractor and sub-contractor employees, or supervisors.
- .19 PPE: Personnel Protection Equipment.
- .20 Project Area: Includes those areas of the building or building site in which any work required under Contract is to take place.
- .21 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g., remove and turn over to City of Toronto).

1.6 REGULATIONS AND GUIDELINES

- .1 Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.
- .2 Where regulations are not present, follow accepted industry standards and applicable Guideline documents.
- .3 Regulations and Guidelines include but are not limited to the following:
 - .1 Ministry of Labour, Immigration, Training and Skills Development (MLITSD) Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
 - .2 Ministry of the Environment, Conservation and Parks (MECP) Regulation for the disposal of waste, including R.R.O. 1990, Reg. 347 as amended.
 - .3 Regulation 490/09 Designated Substances.
 - .4 Ministry of Labour, Guideline, Silica on Construction Projects, 2011.
 - .5 Environmental Abatement Council of Canada (EACC), Mould Abatement Guideline, Edition 3 (2015).

1.7 QUALITY ASSURANCE

- .1 Removal and handling of hazardous materials is to be performed by persons trained in the methods, procedures, and industry practices for abatement in the specified field in which they are engaged in working.
- .2 Ensure work proceeds to schedule, meeting all requirements of the Contract.

- .3 Complete work so that at no time airborne dust, visible debris, or water runoff contaminate areas outside the Abatement Work Area.
- .4 Any contamination of surrounding area (indicated by visual inspection or lab analysis) shall necessitate the clean-up of affected area, and in the same manner applicable to an Abatement Work Area, and at no cost to the City of Toronto.
- .5 All work involving electrical, mechanical, carpentry, glazing, etc., shall be performed by licensed persons experienced and qualified for the work required.
- .6 The Abatement Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs required for the Work in accordance with the applicable construction safety legislation, other regulations, or general construction practice. The Abatement Consultant will not be responsible for or have control or charge over the acts or omissions of the Abatement Contractor, his Subcontractors or their agents, employees or other persons performing any of the Work.

1.8 SUPERVISION

- .1 Provide on-site, an Overall Superintendent(s), who has authority to oversee all aspects of the work, including but not limited to, estimating and negotiation of changes to the contract, update of submission requirements, scheduling, manpower and equipment requirements, and direct communication and co-ordination with Abatement Consultant and City of Toronto's representative.
- .2 Provide on-site, in addition to the Overall Superintendent(s), and for each work shift, a Shift Superintendent, who has authority regarding all aspects related to manpower, equipment and production.
- .3 Supervisory personnel overseeing any mould abatement work must hold a recognized certificate proving attendance at a mould removal training course (2-day minimum duration) and have performed supervisory duties on at least five (5) other mould abatement projects of similar size and complexity.
- .4 The Overall Superintendent(s) must be on-site during all work. Failure to comply with this requirement will result in a stoppage of work at no cost to the City of Toronto.
- .5 Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the City of Toronto. City of Toronto reserves the right to request replacement of supervisory personnel without explanation.
- .6 Do not replace supervisory personnel without written approval from the City of Toronto.

1.9 INSTRUCTION AND TRAINING

- .1 Instruction and training must be provided by a Competent Person.

1.10 SUBMITTALS

- .1 Submit prior to starting work:
 - .1 Insurance certificates specific to coverage provided for any hazardous materials abatement work.
 - .2 MLITSD Notice of Project form, where applicable.

- .3 Copy of Certificate of Approval for disposal of hazardous materials waste and location of landfill.
- .4 Pre-removal damage survey of the Abatement Work Area(s), waste transport routes, and bin storage areas.
- .2 Submit the following information regarding personnel prior to starting work:
 - .1 Resumes of the supervisory personnel.
- .3 Submit the following information regarding HEPA filtered devices prior to construction of enclosure or commencement of any hazardous materials abatement:
 - .1 Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old.
 - .2 Performance data on negative air units including DOP tests which must be no more than 3 months old if the unit is vented directly outdoors or which must be performed on-site immediately prior to initial usage and when HEPA filters are changed if the unit is vented indoors.
 - .3 DOP tests to be performed by an independent testing company.
 - .1 DOP testing company is required to submit a detailed technical report of testing protocol, including Introduction, Methodology, Results, Conclusions, and Recommendations, including results of the Air-Aerosol Mixing Uniformity test as per ASME N510-1989 (1995).
 - .2 DOP testing company must also provide calibration certificates from an independent calibration firm or from the manufacturer of the testing equipment for both the aerosol photometer and the pressure gauge on the aerosol generator dated within 1 calendar year from the on-site testing date.
 - .3 DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing.
 - .4 Proof of calibration of DOP testing equipment.
- .4 Submit the following prior to isolating the work area:
 - .1 Safety Data Sheets (SDS) for chemicals or material used during the Abatement Project including but not limited to the following, where applicable:
 - .1 Adhesive Sprays
 - .2 Encapsulants
 - .3 Mould Cleaning Solutions or Disinfectants. Information regarding disinfectant must include proof of efficacy and Health Canada DIN information.
 - .2 Schedule including estimated times for any specified Milestone Inspections.
- .5 Submit the following upon completion of the work:
 - .1 Manifests, waybills, bills of lading, etc. as applicable for each type of waste.

1.11 INSURANCE

- .1 The Contractor, and any Sub-Contractors responsible for any Hazardous Materials Abatement work shall obtain, maintain, and evidence with a Certificate of Insurance Pollution Liability insurance for risks arising out of operations by or on behalf of the CONTRACTOR. "Pollution Liability" as used herein includes, but is not limited to Bodily Injury including Health Hazards; Property Damage; or Environmental Damage; resulting from the discharge, dispersal, release or escape of any solid, liquid, gaseous or thermal irritant or contaminant, including smoke, vapours, soot, fumes, acids, alkalis, toxic chemicals, medical waste and waste materials into or upon land, or any structure on land, the atmosphere or any watercourse or body of water, including groundwater provided such conditions are not naturally presenting the environment in the concentration of amounts discovered. Pollution Liability shall be provided on an "occurrence" basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period. Without limiting the generality of the foregoing, the policy shall insure the operations of abatement and shall not contain any environmental and/or health hazard exclusions relating to abatement operations.
- .2 Forward all certificates to the City of Toronto before work commences, showing the City of Toronto as additional insured as their interest may appear.
- .3 The City of Toronto may request a certified true copy of any policies.
- .4 The policy shall be endorsed to provide the City of Toronto with 30 days written notice of cancellation or material change or alteration to the policy.
- .5 The limits will not be less than:
 - .1 Pollution Policy: \$2,000,000.00 per occurrence and in aggregate

1.12 INSPECTION

- .1 From commencement of work until completion of clean-up operations, the Abatement Consultant is empowered by the City of Toronto to inspect for compliance with the requirements of governing authorities, adherence to specified procedures and materials, and to inspect for final cleanliness and completion.
- .2 The Abatement Consultant is empowered by the City of Toronto to order a shutdown of work when leakage of a hazardous material or fugitive emission from the controlled work area has occurred or is likely to occur.
- .3 Any deviation from the requirements of the Specifications or governing authorities that is not approved in writing may result in a stoppage of work, at no cost to the City of Toronto.
- .4 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to the City of Toronto.
- .5 Any inspections performed as a result of the Contractor's failure to perform satisfactorily regarding quality, safety, or schedule, shall be back charged to the Contractor.
- .6 Facilitate inspection and provide access as necessary. Make good work disturbed by inspection and testing at no cost to the City of Toronto.

- .7 Refer to applicable Section(s) identified under Article 1.1 General and Related Work for specified Milestone Inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.
- .8 Provide 24 hours written notice to the Abatement Consultant of any request for scheduling of milestone inspections or transportation of waste through Occupied Areas.
- .9 Do not proceed with next phase of work until written approval of any Milestone Inspections specified is received from the Abatement Consultant.

1.13 INSPECTION

- .1 From commencement of work until completion of clean-up operations, the Abatement Consultant will be empowered by the City of Toronto to inspect for compliance with the requirements of governing authorities, adherence to specified procedures and materials, and to inspect for final cleanliness and completion.
- .2 The Abatement Consultant is empowered by the City of Toronto to order a shutdown of work when leakage of a hazardous material or fugitive emission from the controlled work area has occurred or is likely to occur.
- .3 Any deviation from the requirements of the Specifications or governing authorities that is not approved in writing may result in a stoppage of work, at no cost to the City of Toronto.
- .4 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions, and to provide performance to the level specified, shall be at no additional cost to the City of Toronto.
- .5 Any inspections performed as a result of the Contractor's failure to perform satisfactorily regarding quality, safety, or schedule, shall be charged additionally to the Contractor.
- .6 Facilitate inspection and provide access as necessary. Make good work disturbed by inspection and testing at no cost to the City of Toronto.
- .7 Refer to applicable Section(s) identified under Article 1.1 General and Related Work for specified Milestone Inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.
- .8 Provide 24 hours written notice to the Abatement Consultant of any request for scheduling of milestone inspections or transportation of waste through Occupied Areas.
- .9 Do not proceed with next phase of work until written approval of any Milestone Inspections specified is received from the Abatement Consultant.

1.14 WORKER PROTECTION

- .1 Instruct workers before allowing entry to the Abatement Work Area. Instruction shall include training in use of respirators, dress, showering, entry and exiting from an Abatement Work Area, and all other aspects of work procedures and protective measures.
- .2 Workers shall not eat, drink, chew gum or tobacco, vape or smoke in the Abatement Work Area.
- .3 Workers shall be fully protected at all times when the possibility of disturbance of hazardous materials exists.

- .4 Provide soap, towels, and facilities for washing of hands and face, which shall be used by all personnel when leaving the Abatement Work Area.
- .5 Respiratory Protection:
 - .1 Refer to applicable Sections listed under Article 1.1 General and Related Work for type of respiratory equipment specific to each phase or work area.
 - .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or another testing agency acceptable to the MLITSD.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Abatement Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected, and inspected by a Competent Person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing.
 - .10 Instruction on proper use of respirators must be provided by a Competent Person as defined by the Occupational Health and Safety Act.
- .6 Provide protective clothing, to all personnel which:
 - .1 Is made of a material that does not readily retain nor permit penetration of any applicable hazardous building materials.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists, and neck.
 - .3 Once coveralls are worn, treat and dispose of as contaminated waste.
 - .4 Is replaced or repaired if torn or ripped.
- .7 Use hard hats, safety footwear and other protective equipment and apparel required by applicable construction safety regulations.

1.15 VISITOR PROTECTION

- .1 Provide clean protective clothing and equipment, including approved respirators to Authorized Visitors.
- .2 Ensure Authorized Visitors have received required training prior to granting entry into the Abatement Work Area, including but not limited to use of protective clothing, equipment and entry and exit procedures.

- .3 Authorized visitors are required to be fit tested on respirators, prior to entering Abatement Work Area.

1.16 SIGNAGE

- .1 Wherever possible, the following signage shall be located out of public view but at a location, and in sufficient numbers, to adequately warn of any hazards.
- .2 Mould Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:
 - .1 There is a mould dust hazard.
 - .2 Access to the work area is restricted to persons wearing specified protective clothing and equipment.

1.17 WASTE AND MATERIAL HANDLING

- .1 Waste bins must be placed at a location approved by the City of Toronto.
- .2 All bins for hazardous materials must be covered and locked when waste transfer is not being performed.
- .3 Ensure redundant non-hazardous materials, rubble, debris, etc. removed during contaminated work are treated, packaged, transported, and disposed of as appropriate waste.
- .4 Clean and wash equipment prior to removal from Abatement Work Area.
- .5 Place all equipment, tools, and any unused materials that cannot be cleaned in Abatement Waste Containers prior to disposal and/or transportation to a holding or abatement area.
- .6 As work progresses, and at regular intervals, transport sealed and labelled waste containers from the Abatement Work Area to waste bin.
- .7 Refer to procedures detailed under applicable Section(s) as listed under Article 1.1 General and Related Work for the safe handling and removal of any waste materials and/or decontamination of tools or equipment removed from the Abatement Work Area.
- .8 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with City of Toronto. Use a closed, covered cart to transport through Occupied Areas.
- .9 Provide workers transporting waste with means to access full personal protective equipment and all tools and supplies required to properly clean up spilled material in the case of a rupture of a Waste Container.
- .10 Pick-up and drop off garbage bin at pre-approved times and must not interfere with the City of Toronto's operations.
- .11 Cooperate with the provincial Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the City of Toronto.

1.18 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

- .1 Coordinate the following with the City of Toronto, Project or Construction Manager, and Contractor.
- .2 Re-establish objects and items temporarily relocated or disconnected by the Abatement Contractor to facilitate work of this Section.
- .3 Re-establish electrical, communication, HVAC systems, and other services previously disconnected or otherwise isolated to facilitate work of this Section.
- .4 Make good at completion of work, all damage not identified in pre-removal survey.

Part 2 Products and Facilities

2.1 MATERIALS AND EQUIPMENT

- .1 Refer to applicable Section(s) identified under Article 1.1 General and Related Work for specified materials, equipment, or facilities specific to each phase or work area.
- .2 Materials and equipment must be in good condition and free of debris and fibrous materials. Disposable items must be of new materials only.
- .3 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .4 Differential Pressure Monitor: A high precision instrument for measuring pressure differences in the low range, between the Abatement Work Area and Occupied Area. Calibrate regularly to manufacturer's instructions.
- .5 Discharge Ducting: Polyethylene Tubing. Reinforced with wire. Diameter to equal negative pressure machine discharge. Not to be longer than required, or so long that negative pressure is compromised.
- .6 Disinfectant: A broad spectrum disinfectant carrying a Health Canada DIN and suitable for the use intended.
- .7 Ground Fault Panel: Electrical panel as follows:
 - .1 Ground fault circuit interrupters of sufficient capacity to power all electrical appliances including any temporary electrical heaters, equipment, and lights in the Abatement Work Area.
 - .2 Interrupters to have a 5 mA ground fault protection.
 - .3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.
 - .4 Openings sealed to prevent moisture or dust penetration.
 - .5 Inspected by the Electrical Safety Authority.
 - .6 Panel uses CSA approved parts and been constructed, inspected, and installed by a licensed electrician.
 - .7 Provide one Ground Fault Panel for each 5,000 square feet (500 m²) of Abatement Work Area.

- .8 HEPA Filtered Negative Pressure Unit: Portable air handling system which extracts air directly from the Abatement Work Area and discharges the air to the exterior of the building or Occupied Area. Equipped as follows:
 - .1 Prefilter and HEPA filter. Air must pass HEPA filter before discharge.
 - .2 Pressure differential gauge to monitor filter loading.
 - .3 Auto shut off and warning system for HEPA filter failure.
 - .4 Separate hold down clamps to retain HEPA filter in place during change of prefilter.
- .9 HEPA Vacuum: Vacuum with necessary fittings, tools, and attachments. Discharged air must pass through a HEPA filter.
- .10 Mould Cleaning Solution (MCS): A solution comprised of clean, warm water and suitable detergent, such as tri-sodium phosphate (TSP), mixed according to manufacturer's instructions. Ensure detergent selected is suitable for use on surface being cleaned and will not result in any damage, staining or the release of dangerous or offensive vapours.
- .11 Mould Encapsulant: Fosters - Interior Defense (Foster 40-50) or approved alternate. Colour: White.
- .12 Mould Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation, and disposal.
- .13 OSB: Oriented Strand Board.
- .14 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.
- .15 Protective Clothing: Disposable coveralls complete with head covering and full body covering that fits snugly at the ankles, wrists, and neck. Acceptable products: Dupont Tyvek or Kimberly Clark Kleenguard or approved alternate.
- .16 Rip-Proof Polyethylene Sheeting: 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and two (2) layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps.
- .17 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .18 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of water.
- .19 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

Part 3 Execution

- .1 Refer to applicable Section(s) identified under Article 1.1 General and Related Work for specified procedures for work area preparation, maintenance, site dismantlement, application of lock-down agents and all other procedures for the safe handling, removal, and clean-up of hazardous materials specific to each phase or work area.

END OF SECTION

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Part 1 General

1.1 GENERAL AND RELATED WORK

- .1 It is the intent of the following Section to outline key requirements and work procedures for the safe handling, removal, or clean-up of mould present at locations ranging in size from 1-10 m² in size and/or as otherwise specified under this Section.
- .2 Refer to the appropriate Section(s) as listed under Article 1.1 General and Related Work of Section 02 81 00.01, Hazardous Materials Abatement – General Provisions for specified requirements and work procedures for areas with greater or lesser amounts of mould.
- .3 Supply labour, material, plant, and equipment necessary to safely execute and complete work of this Section while in conjunction with work specified, required, or implied under Section 02 81 00.01, Hazardous Materials Abatement - General Provisions.
- .4 Comply with the requirements of this Section during the handling, removal, or clean-up of mould present at locations ranging in size from 1-10 m² in size and/or as otherwise specified under Contract.
- .5 Should the extent of mould encountered, at any one location exceeds 10 m², stop work at said location and immediately notify the Abatement Consultant. Work at said location shall not resume until further direction is provided by the Abatement Consultant.

1.2 WORKER PROTECTION

- .1 Provide facilities for washing of hands and face which shall be used by personnel leaving the Mould Work Area. This can be a washroom in the vicinity of the Abatement Work Area.
- .2 Respirator Protection: Provide personnel with the following respiratory protection:
 - .1 Half-face negative pressure respirator equipped with P100 high efficiency (HEPA) cartridge filters.
- .3 Provide personnel with latex or nitrile gloves and suitable eye protection.
 - .1 Provide personnel with an additional pair of work gloves to be worn over top of the above noted latex or nitrile gloves during any demolition activities including the clean-up of waste materials.
 - .2 Provide personnel with a set of chemical resistant gloves wherever the above specified latex or nitrile gloves do not provide suitable protection based on individual cleaning agents, disinfectants, or encapsulants selected for use.
- .4 Provide personnel with disposable full body coveralls complete with head covering and fits snugly at the ankles, wrists, and neck.
- .5 Mould Work Area Entry & Exit Procedures:
 - .1 Before entering the Mould Work Area, proceed to the enclosure entrance (occupied area side) donning required respirator with new or tested set of filters, disposable coveralls, eye protection, gloves and any other safety gear required by the work at hand. Protective clothing shall cover hair and any reusable clothing.

- .2 Before leaving the Mould Work Area, proceed to the enclosure entrance (contaminated side) before removing contaminated coveralls. Place coveralls worn in the Mould Work Area and any other disposable PPE into an approved waste container located adjacent to the enclosure entrance.
- .3 Ensure footwear worn in the Mould Work Area have been suitable cleaned prior to egress or place into a sealed bag for transportation to the next work area.
- .4 Ensure workers exit the Mould Work Area before removing their respirator.
- .5 Proceed to designated wash area and complete the following:
 - .1 Wash exposed skin and respirator with soap and water.
 - .2 Seal inlet side of respirator filters with tape then remove filters for testing or dispose of as mould contaminated waste.

Part 2 Products and Facilities

2.1 MATERIALS AND EQUIPMENT

- .1 Drop Sheets: 0.15 mm thick woven fibre reinforced fabric bonded both sides with fibre reinforced polyethylene sheet.

2.2 HOARDING WALLS

- .1 Walls separating a Level 2 Mould Work Area from adjoining occupied areas shall be constructed as follows:
 - .1 Polyethylene sheeting installed to fully isolate the Mould Work Area.
 - .2 Enclosure may be supported by the ceiling grid, wood or metal studs, or zip-poles.
 - .3 Enclosure shall have polyethylene sheeting as a top at locations where the enclosure does not extend full height to underside of ceiling or structure.
 - .4 Substitute the above polyethylene sheeting with rip-proof polyethylene in occupied areas.
 - .5 Install curtained doorways to permit ingress or egress.
 - .6 Construct curtained doorways as follows:
 - .1 Place two (2) overlapping sheets of rip-proof polyethylene sheeting in occupied areas over an existing or temporarily framed doorway.
 - .2 Secure the vertical edge of one (1) sheet along one (1) jamb of the doorway and the vertical edge of the second sheet along the opposite jamb. Then secure both sheets to the head jamb of the framed opening.
 - .3 Polyethylene shall be reinforced with duct tape and weight bottom edge to ensure automatic closing. Provide directional arrows indicating opening.

Part 3 Execution

3.1 CLEAN SITE PREPARATION

- .1 Perform a pre-abatement damage survey and submit to Abatement Consultant.
- .2 Isolate or otherwise disable HVAC systems, vents and diffusers located within Mould Work Area. System(s) shall remain disabled until completion of work and final dismantlement of any perimeter barricades.
- .3 Isolate the Mould Work Area from adjoining areas through the constructing of temporary hoarding walls at locations where existing walls do not provide required site isolation.
- .4 Install curtained doorways.
- .5 Maintain emergency and fire exits from Mould Work Area or establish alternative exits satisfactory to Provincial Fire Marshall and local authorities having jurisdiction. Maintain extra routes from occupied areas.
- .6 Install temporary lighting in all work areas at levels that will provide for a safe and efficient use of the work area.
- .7 Seal all below ceiling openings to work area using polyethylene, tape, caulking, etc., including but not limited to windows, doors, vents, diffusers, etc.
- .8 Where specified, isolate existing furnace(s), boiler(s), hot water tank(s) and any other gas-fired equipment or appliances, and in such a manner as to ensure the safe and uninterrupted use of this equipment. Provide sufficient combustion air to overcome the effect of negative pressure within each work enclosure.
- .9 Protect in place, using polyethylene sheeting, drop cloth, or other suitable means any remaining items.
- .10 Protect floor surfaces using a minimum of one-layer rip-proof polyethylene sheeting.
- .11 Excluded from the above, any crawlspace areas or floor surfaces scheduled for removal as part of work completed under this Section.
- .12 Notwithstanding the above exclusions, a drop sheet, suitably sized to capture all fallen debris and waste, must be provided below and immediately adjacent to all points of abatement.
- .13 Install, minimum one (1) layer 6 mil polyethylene sheeting over wall surfaces scheduled to remain wherever such finishes cannot readily be cleaned upon completion of work.
- .14 Ensure surfaces requiring protection are pre-clean using HEPA vacuum or damp cloth prior to installing protection.
- .15 Establish negative pressure within each work enclosure as follows:
 - .1 Provide a minimum of two (2) HEPA vacuums or a suitable sized HEPA filtered negative pressure unit within each work enclosure.
 - .2 Operate vacuums (or negative pressure unit) continuously from this point until completion of site dismantlement and/or as otherwise directed by the Abatement Consultant.

- .3 Provide additional equipment as necessary to maintain specified pressure drop and to ensure, that at all times, air movement at the perimeter of the work enclosure flows inward into the site.
- .4 Distribute negative air source evenly throughout the site.
- .5 Install and make airtight all negative air discharge ducting.
- .6 Leak test in place using DOP test method, negative pressure units and any vacuums, which discharge, directly into any occupied areas. Discharge into occupied areas only with written approval of the Abatement Consultant.
- .7 Install weighted flaps as necessary to provide make-up air.
- .16 Provide required tools, equipment, vacuums, materials, and waste receptacles within each established work enclosure.
- .17 Post signage identifying the area as a Mould Work Area. Wherever possible, such signage shall be located out of public view but at a location, and in sufficient numbers, to adequately warn of any mould hazard.
- .18 Post MLITSD Notice of Project (if required) and corresponding Worker Protection Procedures at each access point to the area.
- .19 Schedule and obtain written approval of any Clean Site Preparation & Set-up – Milestone Inspections specified from the Abatement Consultant before proceeding.

3.2 MAINTENANCE OF MOULD WORK AREA

- .1 Inspect perimeter hoarding walls, decontaminating facility / airlock, and other perimeter seals at the beginning and end of each working period. Inspection must be performed by a Competent Person.
- .2 Inspect HEPA filtered vacuums and any negative pressure exhaust cabinets and any exhaust tubing at the beginning and end of each working period to ensure this equipment is functional properly and is in good condition. Replace any damaged or non-functional equipment upon discovery. Inspection must be performed by Competent Person.
- .3 Repair any damaged hoarding walls, seals, and enclosures immediately upon discovery.
- .4 Maintain work area in a tidy condition and free of dislodged materials or other debris.

3.3 WASTE & MATERIAL HANDLING

- .1 Removal of waste containers, decontaminated equipment and materials from the Mould Work Area shall be performed as follows:
 - .1 The first worker (fully protected inside the Mould Work Area) shall remove any visible dust and gross debris from item being removed. Waste materials shall be placed inside a sealed and approved waste container prior to removal from the Mould Work Area.
 - .2 The first worker then passes the item to a second worker located in the Occupied Area. The second worker then inspects the item for any visual trace of dust or debris, wet wiping any item requiring further cleaning. Any waste bags being removed shall be placed and sealed inside a second approved waste container.

3.4 MOULD ABATEMENT

- .1 As the work progresses, schedule and obtain written approval of any Bulk Removal - Milestone Inspections specified from the Abatement Consultant.
- .2 Prohibit the use of compressed air during any of the following activities.
- .3 Provide temporary support for electrical, telephone, computer and other wall mounted jacks or equipment as required due to the following demolition / cleaning activities.
- .4 Where specified, proceed with the removal of baseboards, wall trimming, any remaining stored, fixed, or non-fixed items scheduled for cleaning, removal, and/or relocation, or as otherwise required to facilitate work of this Section.
- .5 Removal of Building Finishes, Materials Impacted by Mould and Water Damage:
 - .1 Mist materials with water prior to removal to prevent the spread of dust.
 - .2 Where specified, proceed with the removal of building finishes, materials, any content, or debris, scheduled for removal in a controlled fashion to minimize disturbance of mould.
 - .3 Extent line of removal a minimum of one stud width or 300 mm beyond any visible mould growth or staining.
 - .4 Care must be taken during the above work to preserve the integrity of the underlaying vapour barrier (if present) or damage to any concealed services, etc.
 - .5 Remove and dispose of batt insulation exposed by the above work by carefully cutting back, then peeling away, the underlying vapour barrier (where present) to allow access to any insulation and the corresponding wall/ceiling cavity. Care must be taken during this process to maintain the integrity of the underlying vapour barrier adjacent to the lead edge of the opening to allow for the proper repair / reinstatement of the required vapour barrier.
 - .6 At locations where remaining framing members, wood studding or sheathing materials remain contaminated by mould or are structurally compromised due to dry rot, wood decay or excessive mould growth, such surfaces shall be cleaned to remove any loose debris, materials, etc. Ensure this work proceeds in a manner that maintains the integrity of the existing work enclosure. Provide temporary shoring or bracing as required.
 - .7 Notwithstanding the above, and at locations where the demolition of any remaining framing members, wood studding or sheathing materials will result in a breach to the existing work enclosure, such work shall be scheduled following the completion of site dismantlement activities, and while adhering to Level 1 Mould Precautions.
 - .8 Schedule and obtain written approval of any Pre-encapsulant Visual Clearance - Milestone Inspections specified from the Abatement Consultant before proceeding with the application of any encapsulants.
- .6 Any waste materials generated during the work shall be placed into specified waste container(s) and removed from the Mould Work Area as the work progresses.

3.5 APPLICATION OF A POST-ABATEMENT ENCAPSULANT

- .1 Ensure prior written approval is obtained from the Abatement Consultant wherever a corresponding Pre-encapsulant Visual Clearance – Milestone Inspection has been specified before proceeding with the following work.
- .2 Ensure surfaces are clean and dry before applying any post-abatement paints or encapsulants.
- .3 At locations where the removal of remaining framing members, wood studding or sheathing materials visibly contaminated by mould cannot be completed without compromising the integrity of the existing work enclosure, or are otherwise scheduled to remain, proceed with the application of an approved microbial encapsulant. Repeat application process as required to ensure a complete and homogeneous coating of affected surfaces.
- .4 Include with the above any building finishes, components or materials that continue to exhibit signs of residual staining or mould growth.

3.6 POST-ABATEMENT CLEAN-UP

- .1 After completion of the above gross removal work, and the application of any post-abatement encapsulants, perform the following:
 - .1 Wire brush where needed, then HEPA vacuum and/or wet wipe, using a suitable MCS, surfaces from which any mould was removed, or any other surfaces exposed to view by work of this Section.
 - .2 Include with the above, the cleaning of all other surfaces present throughout the work area including any hoardings walls, polyethylene sheeting, etc.
 - .3 Use crevice tools and other attachments as required to ensure a good level of cleanliness.
 - .4 Pre-clean, using a HEPA vacuums and/or by wet wiping, any equipment used within the area prior to its removal from the work enclosure.
 - .5 Bag small hand tools, brushes, and any items which cannot be effectively cleaned prior to their removal from the work enclosure.
- .2 Level of cleanliness must be acceptable to the Abatement Consultant.
- .3 Schedule and obtain written approval of any Visual Clearance – Milestone Inspections specified from the Abatement Consultant before proceeding with the dismantlement of any perimeter barricades, signage, etc.

3.7 SITE DISMANTLEMENT

- .1 Ensure workers engaged in any site dismantlement activities don a minimum of a half-face negative pressure respirator equipped with P100 high efficiency (HEPA) cartridge filters and any other PPE required by the work.
- .2 Ensure the use of HEPA vacuums, where applicable, throughout the following work.
- .3 Dispose of any polyethylene, tape, cleaning material, etc. scheduled for disposal in approved Mould Waste Containers.
- .4 Remove polyethylene sheeting from surfaces.

- .5 Remove polyethylene by carefully rolling away from any walls, etc. inward onto itself.
- .6 Remove residual dust or debris exposed during the above work using a HEPA vacuum.
- .7 Remove signs, hoarding walls, etc. from the work area.
- .8 Seal any negative air cabinet intakes with polyethylene sheeting.
- .9 Seal vacuum hoses and fittings, flexible ductwork and tools used in contaminated work area in 6 mil polyethylene bags prior to removal from the work area.

3.8 REINSTATEMENT OF FINISHES

- .1 The General Contractor, Sub-Contractor, or any other party responsible for any reinstatement work shall first ensure all surfaces, finishes, and materials present at such locations are clearly documented as having been suitable dried.

END OF SECTION

