

Part 1 General

1.1 SUMMARY

- .1 Refer to the following information (further referred to herein as the "Assessment Reports"), attached in the Appendix of the Specifications, for information pertaining to asbestos-containing materials (ACMs) that have been identified and may require disturbance during the Work:
 - .1 EMC Labs, Inc. Laboratory Report 0194218 (analytical result for one sample of 2'x2' ceiling tile panel).
 - .2 City of Winnipeg "Asbestos Inventory Control" for Pan Am Pool (inspection date January 24, 2018, and associated drawings).
- .2 The Assessment Reports indicate that ACMs including, but not limited to, the following are present:
 - .1 ACMs expected to be impacted by the Work:
 - .1 Cement panel ceiling tiles within the main tank area.
 - .2 Vinyl sheet flooring in various offices.
 - .3 Plaster applied to walls and ceilings.
 - .4 Drywall joint compound (north and south basement stairwells)
 - .2 ACMs NOT expected to be impacted by the Work, but potentially present in areas of the Work:
 - .1 Insulation on mechanical pipes (straights and fittings) and ducts.
 - .2 Cement ("transite") pipe.
 - .3 Door jambs (insulated with asbestos-containing insulation).
 - .4 Mastic on pipes and ducts.
 - .5 Exterior stucco.
 - .6 Vermiculite in double wall of the chimney flue (reported as present by the City of Winnipeg – no documentation provided).
- .3 Abatement shall be conducted to handle, alter, remove and/or dispose of ACMs as identified in the Assessment Report in accordance with applicable regulations, guidelines, standards and/or best practices for such work, where such identified ACMs will be impacted (handled, altered, damaged, removed) by the Work, including, but not limited to, the following:
 - .1 Government of Manitoba
 - .1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work.
 - .2 Manitoba Hazardous Waste Regulation MR 55/2003.
 - .2 Safe Work Manitoba
 - .1 Guide for Asbestos Management, 2017.
 - .3 City of Winnipeg Requirements.
- .4 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of ACMs that will be impacted by the Work of this Contract, and such that appropriate plans and budgets can be included in their overall bids. Inclusion of a particular ACM in this specification is not necessarily confirmation that it will require disturbance, alteration, handling, removal or disposal. The actual methods to be used by the Contractor to complete the general Work of this Project may impact how

and to what extent various ACMs will require disturbance, alteration, handling, removal or disposal.

- .5 Unless otherwise determined through risk assessment conducted by the Contractor's competent person, comply with requirements of this section when performing Work that would be considered "Type 2" asbestos abatement work as defined in the Safe Work Manitoba 2017 "Guide for Asbestos Management". For this project, this is expected to include, but may not be limited to, the following:
 - .1 Using hand methods, hand tools and/or power tools equipped with high-efficiency particulate arresting (HEPA) filtered dust collection systems to create penetrations in ACM sheet flooring or ACM plaster within a particular room or area (as a single project, without removal of other ACM sheet flooring and/or ACM plaster in the same room or area), where such disturbance is required to complete the Work, and provided that the removal work can be completed within three hours.
- .6 If the project scope changes and removal, breaking, drilling, cutting or otherwise disturbing more ACM sheet flooring or ACM plaster in a particular room or area is required (as part of the same project), additional precautions (further to those outlined herein) may be necessary.
 - .1 Any proposed changes to the scope for asbestos abatement are to be provided to the Contract Administrator for review/approval. Proposed changes are to be provided in writing by the Contractor's competent person. Proposed changes should follow the provisions of the Safe Work Manitoba 2017 "Guide for Asbestos Management."

1.2 SECTION INCLUDES

- .1 Requirements, applicable procedures and personal protective equipment to be utilized during abatement of ACMs as outlined herein.

1.3 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .3 Section 02 82 00.01 - Asbestos Abatement Type 1 Precautions

1.4 REFERENCES

- .1 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .3 Government of Manitoba
 - .1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work (MB 217/2006).
 - .2 Manitoba Hazardous Waste Regulation MR 55/2003.
- .4 Safe Work Manitoba
 - .1 Guide for Asbestos Management, 2017.

1.5 DEFINITIONS

- .1 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .2 Asbestos-Containing Materials (ACMs): materials that contain asbestos in amounts as listed below, and are identified under Existing Conditions including fallen materials and settled dust:
 - .1 A friable material containing 0.1% or greater asbestos;
 - .2 A non-friable material containing 1.0% or greater asbestos; and
 - .3 Vermiculite insulation that contains any asbestos.
- .3 Asbestos Work Area: area where work takes place which will or may disturb ACMs.
- .4 Authorized Visitors: Contract Administrator, and representatives of regulatory agencies.
- .5 Competent worker: in relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .6 Friable Materials: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .7 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.
- .8 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area: any area of building or work site that is outside Asbestos Work Area.
- .10 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .11 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.

1.6 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to Contract Administrator that suitable arrangements have been made to dispose of asbestos containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Provincial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.

- .5 Submit to Contract Administrator necessary permits for transportation and disposal of asbestos containing waste and proof that asbestos containing waste has been received and properly disposed.
- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training from a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing. Instruction and training related to respirators includes, at minimum:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .7 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration.
- .8 Submit Worker's Compensation Board status and transcription of insurance.
- .9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
 - .1 Encapsulants.
 - .2 Amended water.
 - .3 Slow drying sealer.
- .10 Submit proof satisfactory to Contract Administrator that employees have respirator fitting and testing. Workers must be fit tested with respirator that is personally issued.

1.7 **QUALITY ASSURANCE**

- .1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with applicable provincial occupational health and safety regulations.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
 - .1 Full-facepiece powered, air purifying respirator with P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The

respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

- .2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a 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. It includes suitable footwear, and it to be repaired or replaced if torn.
- .3 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .4 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .5 Ensure workers wash hands and face when leaving Asbestos Work Area.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .7 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling.
- .4 Separate for reuse and recycling and place in designated containers steel, metal, and/or plastic waste.
- .5 Place materials defined as hazardous or toxic in designated containers.

- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Fold up metal banding, flatten and place in designated area for recycling.
- .8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels.
- .9 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.9 EXISTING CONDITIONS

- .1 Reports and information pertaining to ACMS to be handled, removed, or otherwise disturbed and disposed of during this Project are bound into this specification in Appendix A, and/or are available from the Contract Administrator.
- .2 Notify Contract Administrator of suspected ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Contract Administrator.

1.10 SCHEDULING

- .1 Hours of Work: Work times as indicated in Section 01 14 00 - Work Restrictions.

Part 2 Products

2.1 MATERIALS

- .1 Drop and Enclosure Sheets:
 - .1 Polyethylene: 0.15 mm thick.
 - .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Waste Containers: contain waste in two separate containers.
 - .1 Inner container: 0.15 mm thick sealable polyethylene bag.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
 - .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site.
- .3 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
 - .1 Sealer: flame spread and smoke developed rating less than 50.
- .5 Encapsulant: penetrating type conforming to CAN/CGSB-1.205.

Part 3 Execution

3.1 PREPARATION

- .1 Asbestos abatement work is to be completed in general accordance with the requirements of the Safe Work Manitoba 2017 "Guide for Asbestos Management". Where discrepancies exist between that document and these specifications, the more stringent will apply.
- .2 Do construction occupational health and safety in accordance with applicable provincial occupational health and safety regulations.
- .3 Notification to Manitoba Workplace Safety and Health to be completed prior to work resulting in the potential release of ACMs.
- .4 Work Areas:
 - .1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.
 - .1 Lock Out Tag Out will be conducted in accordance with applicable regulations and The City's protocols. All affected persons will be notified, including The City's central control, as well as any facility staff, users or contractors present.
 - .2 Clean proposed work areas using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.
 - .3 The spread of dust from the work area to be prevented by:
 - .1 Using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls.
 - .2 Using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.
 - .4 Put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. The system to maintain a negative air pressure, relative to the area outside the enclosed area. Air is to be exhausted directly outdoors. The system to be inspected and maintained by a competent person prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used.
 - .1 Negative air units are to be dioctyl phthalate (DOP) tested on-site, prior to installation/use, with test results provided to Contract Administrator for review.
 - .5 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
 - .6 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.

- .7 Build airlocks at entrances to and exits from work areas so that work areas are always closed off by one curtained doorway when workers enter or exit.
 - .8 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "CAUTION ASBESTOS HAZARD AREA (25 mm) NO UNAUTHORIZED ENTRY (19 mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)".
 - .9 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Fire Commissioner of Canada and Provincial Fire Marshall Authority having jurisdiction.
 - .10 Where application of water is required for wetting asbestos containing materials, shut off electrical power, provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.
 - .11 After preparation of work areas and Decontamination Enclosure Systems, for the removal of all other asbestos containing materials, remove within work area and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.
- .5 Construction of Decontamination Enclosures:
- .1 Build suitable framing for enclosures or use existing rooms where convenient, and line with polyethylene sheeting sealed with tape.
 - .2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.
- .6 Maintenance of Enclosures:
- .1 Maintain enclosures in tidy condition.
 - .2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
 - .3 Visually inspect enclosures at beginning of each working period.
 - .4 Use smoke methods to test effectiveness of barriers when directed by Contract Administrator.
- .7 Do not begin Asbestos Abatement work until:
- .1 Arrangements have been made for disposal of waste.
 - .2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.
 - .3 Work area[s] and decontamination enclosures are effectively segregated.
 - .4 Tools, equipment, and materials waste containers are on hand.
 - .5 Arrangements have been made for building security.
 - .6 Warning signs are displayed where access to contaminated areas is possible.
 - .7 Notifications have been completed and other preparatory steps have been taken.

3.2 SUPERVISION

- .1 Minimum of one Supervisor for every ten workers is required.

- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

3.3 PROCEDURES

- .1 Before removing asbestos:
 - .1 Prepare site.
 - .2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.
- .2 Remove saturated asbestos material in small amounts. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination area, and store in a holding area pending removal to Unloading Room and outside. Ensure that containers are removed from holding area by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of removal work, wire brush, HEPA vacuum and/or wet-sponge surfaces from which asbestos has been removed to remove visible material.
- .5 Where Contract Administrator decides complete removal of asbestos containing material is impossible due to obstructions such as structural members or major service elements, and provides written direction, encapsulate material as follows:
 - .1 Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces uniformly to substrate.
- .6 After removal of visible asbestos, and after encapsulating asbestos containing material impossible to remove, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24 hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24 hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Contract Administrator apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.
- .7 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .8 Cleanup:
 - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
 - .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.

- .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
- .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
- .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.4 AIR MONITORING

- .1 From beginning of Work until completion of cleaning operations, The City will retain an independent, competent (as described in the Safe Work Manitoba 2017 "Guide for Asbestos Management") third party (further referred to herein as the "Hazmat Consultant") to take air samples inside and outside of Asbestos Work Area in accordance with the recommendations set forth in the Safe Work Manitoba 2017 "Guide for Asbestos Management".
 - .1 Air samples will be collected and analyzed in accordance with NIOSH method 7400.
 - .2 Air sample results will be provided to the Contractor within 8-hours of sample collection.
 - .3 Analysis will be conducted by qualified persons or laboratories that take part in a documented QA/QC program for such analysis.
- .2 Contractor will be notified to stop Work when airborne fibre measurements exceed 0.05 fiber/cubic centimetre (f/cc), when PPE and protection factors are considered, and to correct procedures.
 - .1 Additional monitoring will be conducted, where possible, to verify procedural corrections were effective.
- .3 If air monitoring shows that areas outside Asbestos Work Area are contaminated as determined by the Hazmat Consultant, Contractor will be notified to maintain and clean these areas in same manner as that applicable to Asbestos Work Area, at no additional cost to the Contract.
- .4 In instances where enclosures are used, post-abatement testing will be completed by the Hazmat Consultant.
 - .1 After Asbestos Work Area has passed visual inspection by the Hazmat Consultant and acceptable coat of lock-down agent has been applied to surfaces within enclosure by the Contractor, and appropriate setting period has passed, the Hazmat Consultant will perform air monitoring within Asbestos Work Area.
 - .1 Final air monitoring results must show fibre levels of less than 0.01 f/cc.
 - .2 If air monitoring results show fibre levels in excess of 0.01 f/cc, Contractor will re-clean work area and apply another acceptable coat of lock-down agent to surfaces, at no additional cost to Contract.
 - .3 Repeat as necessary until fibre levels are less than 0.01 f/cc, at no additional cost to Contract.
 - .2 Contractor will be provided with authorization to remove enclosure structures upon receipt of acceptable air sample results.

END OF SECTION