

Part 1 **GENERAL**

1.1 **SUMMARY**

- .1 This specification outlines the basic requirements for the removal of surface coatings (paint) associated with the T-33 aircraft monument prior to or in conjunction with restoration activities located in Woodhaven Park near Portage Avenue in Winnipeg, Manitoba (the "Site").
- .2 Prior to preparation of this specification, Wood Environment and Infrastructure Solutions (Wood) provided the City of Winnipeg with laboratory analysis results for select parameters.
- .3 These specifications and supplementary document(s) are intended to provide Contractors invited to bid on the project with the general procedures and standards of workmanship which are expected to be followed and defines the Contractors' responsibilities. It is the Contractor's responsibility to determine the magnitude of Work. The intent of the information contained in this document is to provide guidance to the successful Contractor in the performance of that Work.
- .4 The Contractor is to abide by all Federal, Provincial and Municipal regulations and is to complete the Work to the satisfaction of the Lou Chubenko and Wood Environment and Infrastructure Solutions (hereby referred to as the Contract Administrator and Independent Testing Agency).

1.2 **RELATED REQUIREMENTS**

- .1 All drawings and all sections of the specifications shall apply to and form an integral part of this Section.
- .2 Related work specified elsewhere:
 - .1 Section 02 83 12 Lead and Other Metals Coating Abatement

1.3 **REFERENCES**

- .1 ALS Group Environmental Analytical Report L2078181, dated 10 April 2018.
- .2 Department of Justice Canada
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
 - .2 Transportation of Dangerous Goods Act, 1992 (TDGA).
 - .3 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
- .3 Health Canada



- .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
 - .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
 - .5 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH).
 - .1 NIOSH 94 113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).
 - .6 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007-[1995], Sampling House Dust for Lead.
 - .7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)
 - .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).
 - .8 Underwriters' Laboratories of Canada (ULC).
 - .9 Manitoba Labour Workplace Safety & Health Division, Guidelines for Working with Lead, August 2002.
 - .10 Province of Manitoba- Workplace Safety & Health Act, Part 36. 2010.
 - .11 Manitoba Workplace Safety and Health Act (C.C.S.M. c. W210), Workplace Safety and Health Regulation (MR217/2006).
- 1.4 **SITE CONDITIONS**
- .1 The restoration of the T-33 aircraft may be completed within Woodhaven Park or at a location determined by the Contractor in agreement with the Contract Administrator.
 - .2 This Section identifies the known conditions at the site with respect to the surface coating on the identified aircraft. This information is provided for reference purposes only and the contractor must confirm existing conditions within the Work area(s) as a part of this contract.
 - .3 The current base of the aircraft requires repair and/or replacement. As such the Contractor may not rely on the integrity of the base during restoration activities.
 - .4 The presence and/or suspect presence of lead and other metals have been identified within the surface coating (paint) on the T-33 aircraft.



- .5 Examine local conditions affecting Work under this Contract. No allowance will be made for necessary changes, unless notification of interferences has been brought to the City of Winnipeg and Contract Administrator's attention, in writing, prior to closing of bids.
- .6 All surface coating materials shall be considered as containing lead and other metals unless proven otherwise by laboratory analysis or other means approved by the Contract Administrator.

1.5 **OUTLINE OF WORK**

- .1 Refer to other Sections of this specification for a specific outline of Work.
- .2 Procedures in addressing lead and other metals amended surface coatings (paint) known to associated with the exterior of the T-33 aircraft.
- .3 The Contractor shall refer to the reference documents listed in Section 1.3 for further information and precautions. In the event a discrepancy between the specifications, the reports, applicable regulations or guidelines occurs, these shall be identified to the Contract Administrator at the time of Bid Opportunity and further direction received.
- .4 Do not remove any materials not specifically identified by the Contract Administrator. Any removal of unauthorized materials shall be at the cost of the Contractor including the cost of repairs or re-insulation subject to the satisfaction of the City of Winnipeg.

1.6 **SITE EXAMINATION**

- .1 Prior to commencing actual Work, check field conditions, obtain and confirm actual site dimensions, examine surface conditions, site restrictions, etc., as required, to ensure correct execution of Work. Notify the Contract Administrator in writing of all matters which could prejudice proper execution of Work.
- .2 Determination of quantities, location, and nature of surface coatings and other regulated Work activities including, but not limited to, considerations for transportation, disposal, handling and storage of materials, availability of labour, worker and visitor protection, water, electric power, roads, uncertainties of weather or physical conditions at the site, is the responsibility of the Contractor.
- .3 Commencement of construction or any part thereof constitutes acceptance of existing conditions and means all dimensions and the scope of Work has been considered, verified and is acceptable.

1.7 **SCHEDULE**



- .1 Work is to be carried out during agreed upon hours with the City of Winnipeg and Contract Administrator. It is expected that normal working hours will be maintained.
- .2 The Contractor is to assume that all Work is to be performed when the area is isolated from public.
- .3 Prior to any on-site activities, the Contractor shall submit a proposed schedule showing phasing and proposed workforce related to abatement operations.
- .4 Modifications to the project schedule would only be granted on approval by the Contract Administrator.

1.8 **GENERAL REQUIREMENTS**

- .1 Supply all labour, material, and equipment necessary to safely execute and complete all Work specified, required, or implied under Section 02 81 00.
- .2 Determine if the current site is suitable to complete the scope of Work or if the T-33 aircraft will be moved to a more suitable location.
- .3 If an off site location is selected to complete the scope of Work, inform the City of Winnipeg and Contract Administrator of the Work location prior to moving the aircraft.
- .4 Prepare and isolate the specified Work area(s) from adjoining occupied and unoccupied areas.
- .5 Construct worker and waste decontamination facilities at the perimeter of the Work area as further specified in the Sections listed in Paragraph 1.2.
- .6 Securing the Work site is the responsibility of the Contractor. Any damage to the Work site or unauthorized access during or after normal working hours resulting from contractor negligence will be the responsibility of the Contractor to make right.
- .7 After preparation and approval of the Work areas and decontamination facilities, remove and dispose of all required materials.
- .8 All work will be subject to inspection inside and outside Work area by the Contract Administrator as further specified in the sections listed in Paragraph 1.2 and Paragraph 1.5.
- .9 All containment structures, such as hoardings, platforms, etc., that are used to segregate the work area are to remain in place until directed by the Contract Administrator.



- .10 When directed by the Contract Administrator, decommission the Work area and decontamination facilities.
- .11 Exercise care and caution in operations relative to the site. Any unnecessary destruction or damage of the site will not be permitted.
- .12 All hazardous materials removed shall be transported and disposed as further specified in the sections listed in Part 3.0 of this Section.

1.9

DEFINITIONS

- .1 **Action level:** employee exposure, without regard to use of respirators, to airborne concentration of lead of 0.05 milligrams per cubic meter of air (0.05 mg/m³) calculated as 8-hour time-weighted average (TWA). Precautions for lead abatement are based on airborne lead concentrations of >0.05 to 0.50 mg/m³ of air for the work specified. The action level for all other relevant parameters is one half of the threshold limit value per the American Conference of Governmental Industrial Hygienists (ACGIH).
- .2 **Airlock:** System for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated areas, typically consisting of two (2) curtained doorways spaced minimum of 2 m apart.
- .3 **Authorized Visitor(s):** The City of Winnipeg, Contract Administrator or person(s) representing regulatory agencies, and person(s) authorized by them.
- .4 **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 applicable laws and with the provisions of the regulation that apply to the Work.
 - .3 Has knowledge of all potential or actual danger to health and safety in the Work.
- .5 **Curtained doorway:** arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
 - .1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.



- .2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.
- .3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.
- .6 **DOP/PAO Test:** A testing method used to determine the integrity of the negative pressure unit using dioctyl phthalate (DOP) or poly alpha olefin (PAO) HEPA filter leak test.
- .7 **Dry Ice:** The solid form of carbon dioxide (CO₂), a colourless, tasteless and odourless gas found naturally in our atmosphere. Dry ice is extremely cold (-78.5°C/-109°F) and when exposed to warmer temperatures, instantly vaporizes (sublimates) from a solid into a gas.
- .8 **Dry Ice Blasting:** A form of carbon dioxide cleaning, where dry ice, the solid form of carbon dioxide, is accelerated in a pressurized air stream and directed at a surface in order to clean or remove surface coatings.
- .9 **Ground Fault Panel:** Portable electrical panel equipped with ground fault circuit interrupters (5 mA protection) of sufficient capacity to power all electrical equipment and lights in asbestos work enclosure. Panel complete with ground fault interrupter lights, test switch to ensure unit is working, and reset switch. Panel is to be installed by licensed technician and meet applicable CSA standards.
- .10 **Hazardous Material:** Materials identified under Site Conditions including fallen materials and settled dust.
- .11 **Hazardous Materials Contaminated Waste:** Materials identified under Site Conditions that have been removed as specified including fallen materials, debris, rubble, and settled dust, and materials and/or equipment deemed to be contaminated under this specification and/or by the Contract Administrator.
- .12 **Hazardous Materials Work Area(s):** Area(s) where work takes place which will or may disturb surface coating materials, including fallen material or settled dust that may contain lead or other metals.
- .13 **HEPA Filter:** High Efficiency Particulate Aerosol filter at least 99.97 percent efficient in collecting 0.3 micrometer aerosol.
- .14 **HEPA Vacuum:** HEPA filtered vacuum with all necessary fittings, tools and attachments. Air must pass HEPA filter before discharge.



- .15 **Lead dust or debris:** Wipe sampling on vertical surfaces and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot or if visible particles are evident to the Contract Administrator.
- .16 **Negative Pressure:** Reduced pressure within specified work area(s) established by extracting air directly from Work area, and discharging directly to exterior of building. Discharged air first passes through HEPA filter. Extract sufficient air to ensure constant reduced pressure at perimeter of Work area with respect to surrounding areas. Air volume extracted should be sufficient to provide four (4) air changes per hour and maintain a reduced pressure of 5 Pascals (0.02 inches water column) within the Work area in relation to the surrounding areas.
 - .1 Negative pressure system shall be equipped with an instrument to continuously monitor and automatically record pressure differences.
- .17 **Negative Air Unit:** Portable air handling system, which extracts air directly from asbestos Work area and discharges air outside building. Unit shall be fitted with pre-filter and HEPA final filter. Air shall pass HEPA filter before discharge. Unit shall have pressure differential gauge to monitor filter loading. Unit shall have warning system for HEPA filter failure. HEPA filter shall have separate hold down clamps to retain filter in place.
- .18 **Occupied Area:** Any area of the site that is outside the Work area.
- .19 **Polyethylene sheeting sealed with tape:** polyethylene sheeting of type and thickness specified sealed with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of asbestos fibres through sheeting into clean area.

1.10 REGULATIONS AND GUIDELINES

- .1 Comply with applicable Building Codes, Electrical, Fire and Construction Safety Codes as well as Federal, Provincial, and local requirements pertaining to asbestos and other designated substances provided that in any case of conflict among these requirements or with these specifications the more stringent requirement shall apply. Work shall be performed under regulations in effect at the time Work is performed.
- .2 Provide necessary notices, obtain permits and pay all fees, in order that Work specified may be carried out. Charges and alterations required by authorized inspector of any authority having jurisdiction, to be carried out.



- .3 Manitoba Workplace Safety and Health Act (C.C.S.M. c. W210), Workplace Safety and Health Regulation (MR217/2006).
- .4 Manitoba Environment Act, Chapter E125, Waste Disposal Grounds Regulation (MR 150/91) as it pertains to asbestos, lead and other hazardous materials.
- .5 Provincial Guidelines or Safe Work Bulletins associated with MR217/2006. Such guidelines and bulletins are available on the SAFE Work Manitoba website at: <http://safemanitoba.com/resources/bulletin#en>.
- .6 The Contractor shall ensure that:
 - .1 Every employee and every worker under their control complies with applicable Acts and Regulations.
 - .2 Health and safety of workers and public area protected.
 - .3 Policies and procedures of the City of Winnipeg are complied with including site specific safety, health and environment requirements.
 - .4 Notify sanitary landfill or waste disposal site as per Municipal and Provincial requirements.
- .7 Laws of Province of Manitoba shall govern this work. The Contractor shall observe all such laws and shall obtain and/or pay all permits, notices, fees, taxes, duties as may be required. Likewise, it is the responsibility of the contractor to comply with Worker's Compensation and Workplace Safety and Health Acts.
- .8 If no regulations exist, follow guidelines most widely accepted by recognized professional organizations such as occupational hygienists, health professionals or environmental engineers as listed in References.

1.11 **QUALITY ASSURANCE**

- .1 Ensure Work proceeds to schedule and meets all requirements of this section.
- .2 Perform Work so airborne contaminants or wastewater run-off does not contaminate areas outside specified Work areas.
- .3 Any contamination of surrounding areas, indicated by visual inspection or air monitoring, shall necessitate the enclosure of these areas and complete clean-up of affected areas in same manner as that applicable to Work areas, at no cost to The City of Winnipeg or Contract Administrator. The Contract Administrator shall be notified as soon as possible following such an occurrence and informed of the measures being implemented to correct the situation.



- .4 Pay cost to The City of Winnipeg of inspection and air monitoring performed as result of failure to perform work satisfactorily.
- .5 Protect and maintain work until Work has been completed and accepted. Protect Work against damage during installation. Repair all damage to existing facilities without expense to The City of Winnipeg or Contract Administrator.
- .6 Coordinate work with other sections to avoid conflict and ensure proper installation of all materials.
- .7 On completion of Work, remove all tools, surplus and waste material and leave work in a clean condition.
- .8 Repair any and all damage to site, including but not limited to rutting or disturbance of the sodded areas, damage to pavement associated with sidewalks, curbs or roadways.
- .9 Use only skilled and qualified workers for all trades required for this Work.

1.12

SUBMITTALS

- .1 The Contractor shall ensure that the following has been submitted to the Contract Administrator prior to commencing Work:
 - .1 Contractor health and safety records.
 - .2 Before commencing any Work, Contractor shall submit, in writing, confirmation of good standing with Worker's Compensation Board.
- .2 The Contractor shall ensure that the following has been submitted to the Contract Administrator at least seven (7) days prior to commencing work:
 - .1 Necessary permits for transportation and disposal of hazardous waste. Submit written proof satisfactory to Contract Administrator that the disposal site is aware of the waste(s) being disposed of and that suitable arrangements have been made to receive and properly dispose of asbestos and other hazardous building materials waste.
 - .2 Names of supervisory personnel who will be responsible for the specified Work area(s).
 - .3 Satisfactory proof that every worker has had instruction and training in the hazards of site materials (as appropriate), in personal hygiene and Work practices, and in the use, cleaning, and disposal of respirators and protective clothing.



- .4 A proposed schedule showing phasing and proposed workforce related to each Work area enclosure or repair operation.
- .5 Negative air unit performance data and results of DOP/PAO test as required.
- .6 Recording manometer calibration data as required.
- .7 Documentation for materials used in the course of the project including MSDS sheets or other data documenting compliance with specifications.
- .8 Provide a written emergency access/egress plan for the work area for acceptance by the Contract Administrator.
- .9 Provide a written visitor entrance procedure for the Work area for acceptance by Contract Administrator.
- .10 If requested, submit copies of Contractor's authorized representative's work site health and safety inspection reports to Contract Administrator on a weekly basis.
- .11 Copies of any reports or directions issued by Federal and Provincial health and safety inspectors.
- .12 Copies of incident and accident reports.
- .13 Manifests, waybills, bills of lading etc. as applicable for each type of waste on completion of the Work or as requested by the Contract Administrator.

1.13

SUPERVISION

- .1 A minimum of one (1) supervisor is required for every ten (10) workers unless otherwise approved by the Contract Administrator.
- .2 An approved supervisor must remain within the designated work area at all times during the disturbance, removal, or other handling of hazardous materials (paint coating or other).
- .3 Site supervision must only be replaced by approved replacement on approval by the Contract Administrator. The Contract Administrator reserves the right to request the replacement of the supervisor without explanation.

Part 2

Products

2.1

MATERIALS



- .1 Materials and equipment specified and acceptable manufactures are named in this specification for the purposes of establishing the standard of materials and workmanship to which the Contractor shall adhere. Tender price shall be based on the use of materials and equipment as specified.
- .2 **Dry Ice:** Solid form of carbon dioxide (CO₂).
- .3 **Flexible ducting:** Metal reinforced flexible ductwork, 300 mm (12") diameter minimum.
- .4 **Polyethylene Sheeting:** 0.15 mm (6 mil) minimum thickness unless otherwise specified. Sheet size shall be such to minimize joints.
- .5 **Protective Coveralls:** Disposable full body coveralls complete with elasticized hoods made of spun polyolefin material or non-woven material and must be rated for lead abatement applications by the manufacturer.
- .6 **Rip-Proof Polyethylene:** 0.15 mm (6 mil) woven fibre reinforced fabric bonded both sides with polyethylene. Sheet size shall be such to minimize joints.
- .7 **Sealer (Lock down agent):** Sealer for purpose of trapping residual debris on rip-proof polyethylene or other surfaces. Product must have flame spread and smoke development ratings both less than 25. Product, such as TC-55 (clear) or equivalent, shall leave no stain when dry. For mechanical equipment, pipes, boilers, etc. use high temperature sealer only, such as Chil-Abate CP210 or equivalent.
- .8 **Tape:** Tape suitable for sealing polyethylene to surface encountered under both wet conditions using amended water, and dry conditions. Standard of acceptance, Nashua 300 polyethylene coated cloth tape, Tyco Adhesives, or equivalent.
- .9 **Waste containers:** Metal, polyethylene or fibre type acceptable to receiving disposal facility and Manitoba Workplace Safety and Health with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.
 - .1 At minimum, label containers with pre-printed cautionary labels clearly visible when ready for removal to disposal site. If required, label containers in accordance with Transportation of Dangerous Goods Regulations.

Part 3

Waste Management and Disposal

3.1

GENERAL REQUIREMENTS AND PROCEDURES



- .1 Place materials defined as hazardous or toxic in designated containers.
- .2 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Provincial and Municipal regulations.
- .3 Check with local landfill operator or waste disposal site to determine type of waste containers acceptable.
- .4 Ensure shipment of containers to landfill or waste disposal site is by a waste hauler licensed by the Province of Manitoba to transport the specified waste materials.
- .5 Transportation of all waste and materials through occupied areas shall be covered and must never be left unattended. Clean-up waste route and loading area after each load. Use appropriate worker protection as required.
- .6 All waste containing designated substances removed as part of this specification must be removed from the Work area at the end of each Work shift unless approved by the Contract Administrator.
- .7 At minimum, each load requires completion of bill of lading showing type and weight of hazardous waste being transported. Provide proof (copies of all waste manifests or other approved documentation) of proper disposal to the Contract Administrator on a weekly basis (at a minimum) and on completion of the project.
- .8 Cooperate with Provincial or Federal inspectors and immediately carry out instructions for remedial work at landfill or waste disposal site to maintain environment, at no additional cost to the City of Winnipeg or Contract Administrator.
- .9 Ensure landfill or waste facility operator is fully aware of substances being disposed.
- .10 Ensure that containers used for disposal are locked and covered at all times.

Part 4 **Inspection and Air Monitoring**

4.1 GENERAL INSPECTION

- .1 The following general inspection specifications shall be followed for all abatement activities.



- .2 From commencement of Work until completion of clean-up operations, the Contract Administrator may inspect for compliance with the requirements of the governing authorities, adherence to specifications and to inspect for cleanliness and completion both inside and outside asbestos and other Work area(s).
- .3 The Contract Administrator is empowered to shut-down all Work activities when leakage of asbestos or other hazardous building materials from the Work area has occurred or is likely to occur.
- .4 The Contractor is to allow inspection by the Contract Administrator and provide full access to the work area. The Contractor shall make good on any Work disturbed by the inspection at no cost to the City of Winnipeg or Contract Administrator.
- .5 If the designated Work area(s) or adjacent areas are found unacceptable in accordance with standards specified or required by authorities having jurisdiction, correct such deficiencies at no cost to the City of Winnipeg or Contract Administrator.
- .6 The Contractor is to pay cost to provide re-inspection of Work found not to be in accordance with these specifications and requirements of authorities having jurisdiction.
- .7 The Contractor is to provide a minimum of 24 hours written notice to the Contract Administrator of any request for scheduling milestone inspections or transportation of waste through an occupied area.
- .8 Do not proceed with next phase of Work until written approval of each inspection is received from the Contract Administration.

4.2 GENERAL AIR MONITORING

- .1 The following general air sampling specifications shall be followed.
- .2 Air sampling may include occupational and area samples including those areas within and immediately adjacent to each work area. Results obtained from all test monitoring shall be posted at the work site and provided to the Project Coordinator, applicable Health & Safety Officer and the Contractor.
- .3 All air samples must be collected and analysed in accordance with Provincial Regulations and Guidelines.



- .4 If air monitoring or visual inspection indicates that areas outside current Work area enclosures are contaminated above the designated action level of one half the Provincial Occupational Exposure Limit or the ACGIH TLV, clean these areas in same manner as that applicable to asbestos work areas, at no cost to The City of Winnipeg or Contract Administrator.
- .5 If air monitoring in Work areas shows that removal procedures are not sufficient to maintain airborne levels of specified substances below that appropriate for the level of personal protective equipment employed by the Contractor, all work is to stop within the work area and removal procedures re-assessed.

END OF SECTION



Part 1 GENERAL

1.1 SUMMARY

- .1 This Specification outlines the basic requirements for the handling and/or disposal of surface coatings with concentrations of lead and other metals, associated with the Golden Centennaires Canadair/Lockheed T-33 Silver Star aircraft prior to or in conjunction with restoration activities located in Woodhaven Park near Portage Avenue in Winnipeg, Manitoba (the "Site").
- .2 Comply with requirements of this Section when performing any of the following Work:
 - .1 Disturbance of surface coatings(paint) by scraping or sanding or removing of materials with coatings using non-powered hand tools.
 - .2 Where hand tools cannot be effectively used or where more major disturbance is expected (i.e. sanding for preparation in painting), removal of paint coatings or materials coated with paint shall be completed using a power tool with an effective dust collection system equipped with a HEPA filter.
 - .3 Where major disturbance is expected (i.e. dry ice blasting for preparation ahead of recoating) and an effective dust collection system equipped with a HEPA filter is not used, removal of paint coatings may require engineering controls such as a negative pressure dust control enclosure and additional worker protection.
- .3 During the preparation of surfaces for recoating, the disturbance of paint coatings shall occur. The Contractor(s) shall minimize potential worker exposure through the use of approved control measures and minimizing the disturbance of such materials as specified.
- .4 It is assumed that wherever reasonable, non-bonded paint coatings (loose material) will be removed by hand scraping methods. Adhered materials shall be dry ice blasted with an effective HEPA filtered dust control system in operation. Typical blasting techniques include provisions for such worker exposure measures as respiratory protection. Dermal protection is required.
- .5 The Contractor is required to provide a work procedure to the Contract Administrator addressing the intended surface coating disturbance activities and measures to be taken to reduce potential worker and environmental exposure issues.

- .6 The Contractor(s) is to abide by all Federal, Provincial and Municipal regulations and is to complete the work to the satisfaction of the City of Winnipeg and their Contract Administrator.
- .7 The Contractor is to cover all costs for inspection and air sampling services (where required to requested by the City of Winnipeg).

1.2 RELATED SECTIONS

- .1 All Drawings and all Sections of the Specifications shall apply to and form an integral part of this Section.
- .2 Related work specified elsewhere:
 - .1 Section 02 81 00 General Requirements.

Part 2 Worker Health and Safety

2.1 WORKER AND VISITOR PROTECTION

- .1 **Instructions:** Before entering work area(s) during surface coating disturbance, instruct workers and visitors in use of respirators (including fit testing), entry and exit from enclosures and all aspects of work procedures and protective measures including appropriate protective clothing, lead awareness and/or abatement training. A competent person, as defined by Workplace Safety and Health Act, shall provide instruction.
- .2 **Respirators:** Provide appropriate respiratory equipment for all persons entering paint work area enclosure including authorized visitors. The following shall apply to the use of respirators:
 - .1 During active Work where there is an airborne expose potential, all workers, supervisors, and authorized visitors shall wear, at minimum, non-powered half-face respirators with minimum N, R or P100 filter cartridges in accordance with NIOSH Part 84 requirements. If dry ice blasting has occurred, the work area shall be monitoring with an electronic gas monitor to confirm that between 19.5% and 21.4% oxygen is present in the space.
 - .2 Dry ice blasting of surface coatings: Tight fitting, positive pressure supplied air respirator is required. Compressed air used to supply supplied air respirators to meet breathing air purity requirements of CAN/CSA-Z180.1. Where an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor/alarm to be provided.
 - .3 Filters shall be replaced daily or tested according to manufacturer's specifications and replaced as necessary. All waste filters shall be disposed of as lead waste.

- .4 Respirators shall be acceptable to the Workplace Safety and Health Branch of Manitoba Growth Enterprise & Trade.
 - .5 Provide instruction to workers and visitors in use of respirators including at minimum qualitative fit testing.
 - .6 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.
 - .7 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.
 - .8 No supervisor, worker or authorized visitor shall wear facial hair which may affect the seal between the respirator and face.
 - .9 Maintain respiratory protection equipment in proper functioning and clean condition. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary. 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.
- .3 **Protective Clothing:** Provide workers and visitors conducting work or present in the Work area with:
- .1 New disposable type protective coveralls and dermal protection (gloves) that do not readily retain or permit penetration of lead or other metals.
 - .1 Coveralls and dermal protection to be provided by the employer and worn by every worker who enters the Work area.
 - .2 Coveralls to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent lead or other metals from reaching the garments and skin under the protective clothing.
 - .3 Use impervious gloves suitable for the cleaning of lead and other metal surfaces and the use of any applicable cleaning agent.
 - .2 Once coveralls are worn, treat and dispose of as metal contaminated waste.
 - .3 Workers and visitors shall also wear other protective apparel required by Manitoba Growth, Enterprise & Trade construction regulations.
 - .4 Footwear shall be of a suitable type that will prevent dust penetration and able to be wet wiped.
- .4 Eating, drinking, chewing, and smoking are not permitted in Work Area.
- .5 Before entering Work Area(s), don appropriate respirator with new or tested filters, new disposable coveralls and dermal protection.

- .6 Persons leaving lead Work area(s) shall:
 - .1 HEPA vacuum or wet wipe clothing and respirator to remove gross contamination.
 - .2 Remove contaminated coveralls and place in receptacles for disposal with other lead and metal contaminated materials.
 - .3 Remove contaminated dermal protection and place in receptacles for disposal with other lead and metal contaminated materials.
 - .4 Still wearing appropriate respirator (if using), proceed out of the established work area to the decontamination facility.
 - .5 Clean using soap and warm water, wash and remove respirator (if using) then thoroughly wash hands and face. Remove filters and dispose of as lead waste in container provided for this purpose or test filters according to manufacturer's recommendation. Dispose of filters as necessary. Wet clean inside of respirator.
 - .6 Upon completion of Work, dispose of footwear as contaminated waste or clean.
- .7 Workers and visitors shall be protected at all times when a possibility of surface coating disturbance exists.
- .8 A copy of the procedures described under Paragraph 1.3: Worker and Visitor Protection shall be posted at access points to the lead work area.
 - .1 Procedures shall be in both official languages if required.
- .9 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 Work area.

2.2 WORKERS' DECONTAMINATION FACILITIES

- .1 Set-up an isolated worker decontamination area adjacent to the Work Area; consisting of a HEPA filtered vacuum, bucket of warm water, soap, rags (or disposable wash cloths and towels), and disposal container for lead contaminated protective clothing.

Part 3 Waste Management and Disposal

- .1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .2 Separate waste streams; i.e. Protective clothing and polyethylene sheeting shall be placed in separate containers from paint coated materials.
- .3 Paint waste must be placed in sealed Waste Containers.
- .4 All lead or other metal containing waste, including dust, particulate and wash water containing lead or other metals must be disposed of at a licence waste disposal facility.
 - .1 The Contractor must notify the waste disposal facility of the materials intended to be disposed of and provide proof that the waste streams will be accepted.
- .5 Ensure shipment of containers to landfill or waste disposal site is by a waste hauler licensed by the Province of Manitoba to transport the specified waste materials.
- .6 Transportation of all waste and materials through occupied areas shall be covered and must never be left unattended. Clean-up waste route and loading area after each load. Use appropriate worker protection as required.
- .7 All waste containing hazardous materials removed as part of this specification must be removed from the Work area at the end of each work shift unless approved by the Contract Administrator.
- .8 Ensure that containers used for disposal are locked and covered at all times.
- .9 Each load requires completion of at minimum a bill of lading showing type and weight of hazardous waste being transported. Provide proof (copies of all waste manifests or other approved documentation) of proper disposal to the Contract Administrator on a weekly basis (at a minimum) and on completion of the project.
- .10 Cooperate with Manitoba Sustainable Development municipal inspectors and immediately carry out instructions for remedial work at landfill or waste disposal site to maintain environment, at no additional cost to the City of Winnipeg.
- .11 Confirm with local landfill operator or waste disposal site to determine type of waste containers acceptable.
- .12 Ensure landfill or waste facility operator licensed to dispose of and is fully aware of substances being disposed (i.e. Paint chips, wash water and others).

Part 4 Execution

4.1 PREPARATION

- .1 It is assumed that the Work area will function as the isolation containment.
- .2 Complete isolation measures to form a sealed Work enclosure. Seal using polyethylene sheeting, tape or other approved measures.
- .3 Build airlocks at entrances and exits from Work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.
- .4 Erect appropriate worker and waste decontamination facilities at locations approved by the Contract Administrator.
- .5 Where a washing or wet process is to be used, ensure that proper containment and collection for the wash water is in place.
- .6 Maintain emergency fire exits or establish alternatives satisfactory to Authority having jurisdiction.
- .7 If required, provide temporary lighting in lead work area to levels that will permit Work to be done safely.
- .8 Provide electrical power and shut off for operation of powered tools and equipment.
- .9 Where water or wet processes are used, provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.
- .10 Do not start Work until:
 - .1 Arrangements have been made for disposal of waste.
 - .2 Work Area is effectively segregated.
 - .3 Tools, equipment, and materials waste containers are on site.
 - .4 Arrangements have been made for Site security.
 - .5 Notifications have been completed
 - .6 Warning signs are displayed in areas where access to Work Area is possible. Signs shall read:

CAUTION (25 mm high)
Lead Hazard Area (19 mm high)
Unauthorized Entry Prohibited (19 mm high)
Wear Assigned Protective Equipment (19 mm high)
Breathing Lead Dust May Cause Serious Bodily Harm (19 mm high).

- .7 Worker and waste decontamination area set-up.
- .8 The Contract Administrator has been notified of intention to proceed, has reviewed enclosures, equipment, procedures, and other submitted materials, and has granted authorization to proceed.

4.2 DECONTAMINATION ENCLOSURE SYSTEM

- .1 Construct a minimum two stage worker decontamination facilities at entrance to or immediately adjacent to Work Area as approved by the Contract Administrator.
- .2 Provide a set of curtain doorways between each room, and at both dirty and clean entrances to enclosure systems.
- .3 Access Room: When requested, build or establish an Access Room between Work enclosure and Clean Room. Room shall be of sufficient size for number of workers and equipment used. Access Room is to be used for changing out of protective clothing and storage of contaminated protective clothing and equipment. Minimum size of room is to be 1.5 square metres with a minimum height of 1.9 m.
- .4 Clean Room: Build Clean Room to be used as change room (to and from street clothes) with washing facilities for hands and face. Install waste receptor, and storage facilities for worker's shoes and clothing. Clean Room shall be large enough to accommodate at least one worker and allow sufficient space to undress comfortably. Minimum size of room is to be 1.5 square metres with a minimum height of 1.9 m.
 - .1 The washing facilities shall include as a minimum, a wash basin with clean, warm water, soap and rags or towels.
- .5 A similar decontamination process shall be set-up adjacent to the lead Work area and used for the decontamination of equipment and waste containers prior to removal from the lead Work area. System shall allow for the HEPA vacuuming and wet wiping of waste containers and equipment, labelling and sealing of waste containers if necessary, and temporary storage pending removal from the Site.
- .6 Wet clean external surfaces of equipment and waste containers removed from the lead work area thoroughly. Remove from immediate working area to staging area. Wet clean external surfaces thoroughly for a second time. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean protective clothing and respirators (as appropriate).
- .7 Maintenance of Enclosures:
 - .1 Maintain enclosures in tidy condition. Thoroughly clean decontamination facilities at the end of each Work shift.

- .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
- .3 Visually inspect enclosures at beginning and end of each working period.

4.3 LEAD AND OTHER METALS ABATEMENT WORK

- .1 Using a HEPA vacuum fitted with a scraper or abrasive tool, remove all loose paint coatings.
- .2 Removal of surface coatings (paint) may be performed using dry ice blasting methods.
 - .1 Electronic gas monitor shall be used to monitor oxygen levels during dry ice blasting. Blasting shall be interrupted if oxygen levels are measured at or below 19.5% until oxygen levels return above 19.5%.
 - .2 No workers shall enter the work area during dry ice blasting operations unless they are wearing all required PPE including a tight fitting positive pressure supplied air respirator.
 - .3 No workers shall enter the work area after dry ice blasting unless the oxygen level within the space is confirmed to be between 19.6 to 21.4% unless wearing full PPE including a supplied air respirator.
- .3 If waste debris falls, promptly HEPA vacuum debris.
- .4 Conduct removal or other work as specified. The use of HEPA filtered equipment (including negative pressure machine) shall be employed during the removal or repairs of materials where hazardous dust could be generated.
- .5 Following removal of materials coated with paint, remove remaining unbounded paint material using hand scraping or a HEPA filtered system.
- .6 Remove paint or paint coated materials in manageable sections and pack as it is being removed in approved waste containers. Seal when full.
- .7 After paint coatings or materials with paint coatings are removed, HEPA vacuum surface and where possible wet clean entire work area and equipment used in process.
- .8 After removing all visible dust and debris from the work area, request visual inspection and acceptance.

4.4 FINAL CLEANUP

- .1 On approval of the Contract Administrator, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of Work area. Immediately HEPA vacuum visible particles observed during cleanup.

- .3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .1 Clean up Work area, Decontamination Room(s), and other contaminated enclosures.
- .2 Remove sealed waste containers and equipment used in Work and remove from work areas at appropriate time in cleaning sequence.
- .3 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

Part 5 Inspection and Air Monitoring

5.1 INSPECTION

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by the Contract Administrator will result in work stoppage, at no cost to The City of Winnipeg.
- .2 At the City of Winnipeg's discretion, the Contract Administrator will inspect work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
- .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .4 The Contractor is to pay cost to provide re-inspection of work found not to be in accordance with these specifications and requirements of authorities having jurisdiction.
- .5 The Contractor is to provide a minimum of 48 hours written notice to the Contract Administrator of any request for inspections.
- .6 Do not proceed with next phase of Work until written approval of each inspection is received from the Contract Administrator.

5.2 AIR AND SURFACE SAMPLING

- .1 The requirement for air and surface sampling will be determined by the Contract Administrator and the City of Winnipeg.
- .2 Air sampling may include occupational and area samples including those areas within and immediately adjacent to each Work area. If collected, results obtained from all test monitoring shall be posted at the Work site.

- .3 All air samples must be collected and analysed in accordance with Manitoba Workplace Safety and Health Regulations and Guidelines.
- .4 If air monitoring in Work areas shows that removal procedures are not sufficient to maintain airborne levels of specified substances below that appropriate for the level of personal protective equipment employed by the Contractor, all Work is to stop within the work area and removal procedures re-assessed.
- .5 If surface wipe sampling is conducted and results show levels of lead in excess of 40 micrograms per square foot, re-clean Work area at Contractor's expense and, where approved, apply another acceptable coat of lock-down agent to surfaces.

END OF SECTION