Colliers Project Leaders

ADDENDUM

Project:	**Residential Demolition Project**		
Addendum No.:	02	No. of Pages	72
Date:	September 14, 2022	Doc. No.	P0303-1475992023-14 (1.0)

The following change(s) to the Tender Documents are effective immediately. This Addendum forms part of the Contract Documents.

2.1 QUESTIONS:

1. **Question:** Will the Environmental Consultant be retained by the Town of Drumheller/Colliers for the air monitoring required during the removal of the asbestos containing materials, or will this be the responsibility of the Demolition Contractor?

   Answer: It is the Demolition Contractor's responsibility to undertake air monitoring during the abatement.

2.2 CLARIFICATION:

1. Please keep all trees on all three sites if possible. If the tree has to be removed to facilitate the house demolition, then that is permissible. The area is being turned into an Environmental Reserve so the more trees the better.
2. Any scrap materials must be removed from all the sites as part of the work. This includes the roofing tiles shown in the below photo at the property 105 4 St W Lehigh.

2.3 APPENDIX UPDATE:

1. Please see additional **APPENDIX G – ADDITIONAL SPECIFICATIONS** for the Hazardous Materials Specifications.

APPENDIX G – ADDITIONAL SPECIFICATIONS

PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Related work specified elsewhere:

Section 02 82 00.01	Asbestos Abatement – Low Risk Precautions
Section 02 82 00.02	Asbestos Abatement – Moderate Risk Precautions
Section 02 82 00.03	Asbestos Abatement – High Risk Precautions
Section 02 83 10	Lead Abatement – Minimum Precautions
Section 02 83 11	Lead Abatement – Intermediate Precautions
Section 02 84 00	Non-Liquid Polychlorinated Biphenyl Abatement
Section 02 84 16	Mercury Abatement
Section 02 85 10	Silica – Minimum Precautions
Section 02 85 11	Silica – Intermediate Precautions

.3 Site Conditions identifies all known hazardous building materials within the Project Area. The information provided is for general reference only. Each Contractor must confirm existing conditions on site prior to tender close.

.1 The specification fulfils the requirements of the Occupational Health and Safety Act, Regulation and Code.

.4 The Outline of Work identifies the location, condition and quantities of hazardous building materials to be removed as part of this project.

.1 It is the intent that work prescribed this Section will result in the removal of all hazardous materials as outlined and the decontamination of all surfaces or materials which may have been or become contaminated by hazardous materials either during or prior to work of this Contract.

1.2 Site Conditions

.1 Refer to the following reports:

.1 “Hazardous Materials Assessment Report, 105 4 Street, Drumheller, Alberta”, Dated July 14, 2022, prepared by ECOABATE Environmental Solutions., file number E2791

.2 “Hazardous Materials Assessment Report, 964 Hunter Drive, Drumheller, Alberta”, Dated June 10, 2022, prepared by ECOABATE Environmental Solutions., file number E2737

.3 “Hazardous Materials Assessment Report, 1000 Hunter Drive, Drumheller, Alberta”, Dated August 25, 2022, prepared by ECOABATE Environmental Solutions., file number E2869

1.3 Outline of Work

.1 Refer to the hazardous materials assessment reports provided for the extent of the Abatement Work Area(s).

.2 Remove and dispose of the following materials as clean waste prior to hazardous materials abatement work without disturbing asbestos-containing materials:

.1 Carpet, thresholds, tack strips and underpad.

.2 Millwork and cabinets.

.3 Doors and door hardware.

.3 Using procedures prescribed in the Sections identified in Related Work, remove and dispose of the following:

.1 All hazardous materials identified in the provided hazardous materials assessment reports.

.4 Provide and pay for site inspection and air monitoring services specified herein.

.5 Refer to Specification Sections identified in the Related Work for specified personnel protective measures for the safe handling, removal, clean-up, enclosure, or repair of hazardous materials in each phase or work area.

.6 Visit the site prior to tender close to confirm the location and extent of any hazardous building materials or materials contaminated by hazardous materials.

.7 Protect surfaces, building fabrics and items remaining within the Abatement Work Area.

.8 Isolate the Abatement Work Area from adjoining Occupied and Non-Occupied Areas 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 Perform selective demolition of mechanical and electrical equipment, building components, materials and items scheduled for demolition at locations required to facilitate asbestos removal. Refer to Specification Sections identified in the Related Work for responsibility of demolition work and disposal.

.11 Remove and dispose of as appropriate waste, building components, materials and items contaminated by hazardous materials that cannot be effectively cleaned.

.12 Encapsulation will not be permitted where removal of building materials or structures scheduled for demolition will facilitate access to the asbestos materials in question.

.13 Final clean work area to remove visible signs of asbestos and other hazardous materials, other debris or settled dust.

.14 Apply lock-down agent to exposed surfaces throughout the work area and to surfaces from which any hazardous materials have been removed.

.15 Unless otherwise specified, the handling, removal, clean-up or repair of hazardous materials or surfaces contaminated with hazardous materials is to be performed following wet removal techniques.

1.4 Schedule

.1 Provide necessary manpower, supervision, equipment and materials to maintain and complete the project on schedule.

.2 Work Hours:

.1 Normal Work Hours: 08:00 through 17:00 (Mon. - Fri.).

.2 Quiet Hours: As directed by the client.

.3 Provide 48 hours written notice to the client of any request to work outside normal working hours. Obtain written approval before proceeding.

1.5 Definitions

.1 Abatement Consultant: Owner'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 materials.

.4 Amended Water: Water with wetting agent added for the purpose of reducing surface tension to allow thorough wetting of materials.

.5 Asbestos: Any of the fibrous silicates including: actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.

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

.7 Authorized Visitors: Building Owner, Abatement Consultant, or designated representative, and persons representing regulatory agencies.

.8 Competent Worker: In relation to specific work, means a worker who is adequately qualified, suitable training and has sufficient experience to safely perform the work, either without supervision or with only a minimal degree of supervision.

.9 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.

.10 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.

.11 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 ANSI/ASME N510-2007.

.12 Fitting: Individual segments or pieces of a mechanical service line which may include but is not limited to the hangers, tees, elbows, joints, valves, unions, etc.

.13 Friable Material: Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

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

.15 Lead-Containing Paint: A paint (or surface coating) in which the concentration of total lead exceeds 90 mg/kg (ppm or 0.009%) when a dried sample is tested in accordance with a method that conforms to good laboratory practices. This value is consistent with the federal definition of a lead-based paint outlined in the Surface Coating Materials Regulation (SOR/2016-193) under the Canada Consumer Product Safety Act; recognized by the Alberta Government.

.16 Lead Waste: Waste generated from removal of lead-containing materials, or the substrate and paint finish where left intact.

.17 Mercury Waste: Equipment, materials or items containing mercury or contaminated with mercury.

.18 Milestone Inspection: Inspection of the Abatement Work Area at a defined point in the abatement operation.

.19 Negative Pressure: A reduced pressure within the Abatement Work Area (>0.02 inches of water column) established by extracting air directly from Abatement Work Area and discharging it to exterior of building.

.20 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.21 Occupied Area: Any area of the building or adjoining space outside the Abatement Work Area.

.22 Personnel: All Contractor’s employees, sub-contractors’ employees, supervisors.

.23 PCBs: Monochlorinated or Polychlorinated Biphenyls (or any mixture of both).

.24 PCB Material: Solid material containing PCBs at a concentration of more than fifty milligrams per kilogram (mg/kg) or 50 parts per million (ppm), or liquid with greater than 2 mg/kg or ppm.

.25 PCB Waste: PCB Equipment, PCB Material, PCB Liquids and materials or items contaminated with PCBs.

.26 PCM: Phase Contrast Microscopy.

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

.28 Restricted Area: A Restricted Area, as defined in the Alberta Occupational Health and Safety Code, is an area of a work site where there is a reasonable chance that the airborne concentration of asbestos exceeds or may exceed the Occupational Exposure Limit (OEL).

.29 Toxicity Characteristic Leachate Procedure (TCLP): Laboratory analysis to determine leachable parameters in lead waste.

.30 TEM: Transmission Electron Microscopy.

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. update this section.

.3 Regulations and Guidelines include but are not limited to the following:

.1 Occupational Health and Safety Act, Regulations and Code, Province of Alberta.

.2 Alberta Asbestos Abatement Manual, Government of Alberta, Ministry of Labour and Immigration, 2019.

.3 Environmental Protection and Enhancement Act, Waste Control Regulation, Alberta Regulation 192/96.

.4 Alberta User Guide for Waste Managers, Alberta Environment, 1996.

.5 Guidelines for the Disposal of Asbestos Waste, Alberta Environment, 1989.

.6 Transportation of Dangerous Goods Regulations SOR/2008-34, Transportation of Dangerous Goods Act.

.7 PCB Regulations, SOR 2008-273, Canadian Environmental Protection Act.

.8 Workplace Health and Safety Bulletin, Lead at the Work Site, Government of

Alberta, Human Services, November 2013.

.9 Best Practices: Mould at the Work Site, Government of Alberta, Employment and Immigration, Jul 2009.

.10 Workplace Health and Safety Bulletin, Mercury at the Work Site, Government of Alberta, Employment and Immigration, January 2010.

.11 Occupational Health and Safety Bulletin, Crystalline Silica at the Work Site, Government of Alberta, Employment and Immigration, November 2009.

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.

.2 Ensure work proceeds to schedule, meeting all requirements of this Specification.

.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 air monitoring) shall necessitate the clean-up of affected area, and in the same manner applicable to an Abatement Work Area at no cost to the Owner.

.5 All work of this Section involving electrical, mechanical, carpentry, glazing, etc., shall be performed by licensed persons experienced and qualified for the work required.

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 Owner'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 must hold a provincial Occupational Health & Safety for the Asbestos Worker training card and have performed supervisory functions on at least five (5) other asbestos abatement projects of similar size and complexity.

.4 At all times during work, the Overall or Shift Superintendent(s) must be on site. Failure to comply with this requirement will result in a stoppage of all work, at no cost to the Owner.

.5 Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the Owner. Owner reserves the right to request replacement of supervisory personnel without explanation.

.6 Do not replace supervisory personnel without written approval from the Owner.

1.9 Notification

.1 Inform all trades on site of the presence and location of hazardous materials identified in the Contract documents.

.2 Notify the Owner or Owner's Representative, and the Joint Work Site Occupational Health and Safety Committee, if suspected asbestos-containing materials not identified in the contract documents are discovered during the course of the work. Stop work in these areas immediately.

1.10 Submittals

.1 Submit prior to starting work:

.1 Copy of the Asbestos Project Notification Acknowledgement form received from Alberta Occupational Health and Safety including the completed copy of the Asbestos Project Notification form (form WHS 3910).

.2 Workers' Compensation Board Clearance Certificate.

.3 Certificates of Insurance.

.4 Site specific work procedures.

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

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

.1 Resumes of the supervisory personnel.

.2 Valid Occupational Health & Safety for the Asbestos Worker training cards for all personnel who work within a high-risk asbestos enclosure and/or a Restricted Area.

.3 WHMIS training certificates for all personnel.

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

.5 Proof, satisfactory to the Consultant, that all persons involved in the transport and disposal hazardous materials have been trained in accordance with the requirements of Federal and Provincial Transportation of Dangerous Good Acts and Regulations.

.3 Submit the following information regarding HEPA filtered devices prior to construction of enclosure or 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 performed on site immediately prior to initial usage, on a monthly basis, and when HEPA filters are changed.

.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 for chemicals or material used during the Abatement Project.

.5 Submit the following upon completion of the work.

.1 A waste disposal statement of intent, documenting that asbestos waste will be disposed of in accordance with provincial requirements.

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

1.11 Insurance

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

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

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

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

.5 Pinchin Ltd. and OWNER may request a certified true copy of the policies.

.6 The limits will not be less than:

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

1.12 Inspection

.1 Provide and pay for site inspection services as specified herein.

.2 Retain the services of the Abatement Consultant to perform at a minimum, one (1) randomly scheduled site inspection per 8 hour work shift during all active removal, repair or clean-up of hazardous materials.

.3 From commencement of work until completion of clean-up operations, the Abatement Consultant will be empowered by the Owner to inspect for compliance with the requirements of governing authorities, adherence to specified procedures and materials, and to inspect for final cleanliness and completion.

.4 The Abatement Consultant is empowered by the Owner to order a shutdown of work when leakage of asbestos from the controlled work area has occurred or is likely to occur.

.5 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 Owner.

.6 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 Owner.

.7 Any inspections performed as a result of Contractor's failure to perform satisfactorily regarding quality, safety, or schedule, shall be charged additionally to the Contractor.

.8 Facilitate inspection and provide access as necessary. Make good work disturbed by inspection and testing at no cost to the Owner.

.9 Refer to the Sections identified in 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.

.10 Provide 24 hours written notice to the Abatement Consultant of any request for scheduling of milestone inspections or transportation of waste through Occupied Areas.

.11 The following Milestone Inspections may take place, at the Owner's cost, as outlined in each related specification section OR which will be confirmed at the initial start-up meeting:

.1 Milestone Inspection - Clean Site Preparation

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

.2 Milestone Inspection – Bulk Removal Inspection

.1 Inspection during hazardous materials removal, monitoring removal methods, site deficiencies, performing occupied air monitoring, etc.

.3 Milestone Inspection - Visual Clearance

.1 Inspection of Abatement Work Area after completion of all abatement, but prior to application of lock-down agents or dismantling of enclosure.

.4 Milestone Inspection – Clearance Sampling

.1 Air monitoring performed following removal of asbestos and application of slow drying sealer to ensure fibre levels inside the enclosure(s) are within the acceptable limits.
.2 Lead wipe sampling performed following removal of lead containing materials, cleaning and drying time to ensure lead concentrations on remaining are within the acceptable limits.

.5 Milestone Inspection – Dismantling Inspection

.1 Inspection of the Abatement Work Area and adjacent areas, following completion of all abatement and required air sampling, but prior to Contractor demobilization from the Site.
.2 Inspection of the Abatement Work Area and adjacent areas, following completion of all abatement and required air sampling, but prior to re-establishment of items.

.12 Do not proceed with next phase of work until written approval of each milestone is received from the Abatement Consultant.

1.13 Air Monitoring - Asbestos

.1 Provide and pay for air monitoring services as specified herein.

.2 Retain the services of the Abatement Consultant to complete at a minimum, the following level of air monitoring:

.1 Collection and analysis of one (1) PCM air sample at the perimeter of each separate Abatement Work Area once per 8-hour work shift during all active removal, repair or clean-up of asbestos-containing or asbestos-contaminated materials.

.2 Collection and analysis of one (1) PCM air sample within the Clean Room of each Abatement Work Area once per 8-hour work shift during all active removal, repair or clean-up of asbestos-containing or asbestos-contaminated materials.

.3 Collection and analysis of one (1) occupational (personal) PCM air sample within each separate Abatement Work Area once per 8-hour work shift during all

active removal, repair or clean-up of asbestos-containing or asbestos-contaminated materials.

.4 Collection and analysis of one (1) PCM air sample, per every 2,500 sq. ft., to be collected within each Abatement Work Area following the completion of all asbestos removal, repairs or clean-up, but prior to re-occupancy of the area by non-protected personnel.

.3 Air monitoring will be performed using Phase Contrast Microscopy (PCM) following the National Institute for Occupational Safety and Health (NIOSH) Method 7400.

.4 Co-operate in the collection of air samples, including providing workers to wear sample pumps for up to full-shift periods (occupational or personal samples). Contractor will be responsible for the cost of testing equipment repairs or resampling resulting from the actions of the Contractor's forces.

.5 Results of PCM samples of 0.05 fibres per cubic centimeter of air (fibre/cc) or greater, outside an Abatement Work Area, or from within the Abatement Work Area during or following Glove Bag Work, will indicate asbestos contamination of these areas. Respond as follows:

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

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

.3 Maintain work area isolation and repeat clean-up operations until visually inspected and air monitoring results are at a level equal to that specified.

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

.6 Results of 0.01 fibres per cubic centimeter of air (fibre/cc) or greater, collected within the Abatement Work Area enclosure after the site has passed a visual inspection, and an acceptable coat of lock-down agent has been applied, will indicate asbestos contamination of these areas. Respond as follows: enclosure after the site has passed a visual inspection, and an acceptable coat of lock-down agent has been applied, will indicate asbestos contamination of these areas. Respond as follows:

.1 Maintain work area isolation and re-clean entire work area. Then apply another acceptable coat of lock-down agent to exposed surfaces throughout the work area.

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

.7 When results exceed 50% of maximum use concentration for the respirator being used within the Work Area, respond as follows: respond as follows:

.1 Immediately stop work within the Abatement Work Area.

.2 Instruct workers to exit the Abatement Work Area via the Worker

Decontamination Facility while observing specified personnel exiting procedures.

.3 Contractor's forces shall not re-enter the Abatement Work Area for a period of 8 hours or until authorized by the Abatement Consultant.

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

.8 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 Owner.

.9 Cost of additional inspection and sampling performed as a result of elevated fibre levels in areas outside the Abatement Work Area or from within the work area following completion of work, will be back-charged to the Contractor.

1.14 Worker Protection

.1 Instruct workers before allowing entry to the Low or Moderate 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 must possess a valid Occupational Health & Safety for the Asbestos Worker training card prior to entry into a High-Risk Abatement Work Area. Workers must not enter into a Restricted Area without a valid card.

.3 Workers shall not eat, drink, chew gum or tobacco, or smoke in the Abatement Work Area.

.4 Workers shall be fully protected at all times when possibility of disturbance of hazardous materials exists.

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

.6 Respiratory Protection

.1 Refer to each particular Section of the Specification for specified type of respiratory equipment specific to each phase or work area.

.2 Respirators shall be:

.1 Used in accordance with the Occupational Health and Safety Code.

.2 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other organization acceptable in the provincial legislation.

.3 Selected and used in accordance with Canadian Standards Association (CSA) Standard Z94.4-11, Selection, Care, and Use of Respirators.

.4 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.

.5 Assigned to a worker for their exclusive use.
.6 Maintained in accordance with manufacturer's specifications.
.7 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
.8 Repaired or have damaged or deteriorated parts replaced.
.9 Stored in a clean and sanitary location.
.10 Provided with new filters as necessary, according to manufacturer's instructions.
.11 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing.
.12 Instruction on proper use of respirators must be provided by a competent person.

.3 Provide protective clothing, to all personnel which:

.1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres or lead/silica dust.
.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.

.4 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 to Authorized Visitors.

.2 Instruct Authorized Visitors in the use of protective clothing and Abatement Work Area entry and exit procedures.

.3 Visitors may not enter a High Risk Abatement Work Area and/or a Restricted Area without a valid Occupational Health & Safety for the Asbestos Worker training card.

1.16 Signage

.1 Asbestos Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:

.1 Caution: asbestos dust hazard.

.2 Access to the work area is prohibited except to authorized persons wearing protective clothing and equipment.

.2 Lead Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:

.1 There is a lead dust, fume or mist hazard.

.2 Access to the work area is restricted to authorized persons.

.3 Respirators must be worn in the work area.

.3 Silica Warning Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:

.1 There is a silica dust hazard.

.2 Access to the work area is restricted to authorized persons.

.3 Respirators must be worn in the work area.

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

.1 CONTAINS ASBESTOS FIBRES

.2 Avoid Creating Dust and Spillage

.3 Asbestos May be Harmful to Your Health

.4 Wear Approved Protective Equipment.

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

1.17 Differential Pressure Monitoring

.1 Provide and install differential pressure monitors as specified in each section.

.2 Replace damaged or non-functional equipment at the request of the Abatement Consultant.

.3 Record at minimum twice daily, and when damage to the enclosure is identified and repaired, the following information:

.1 Name of inspector.

.2 Date and time.

.3 Pressure reading.

.4 Repairs completed, if applicable.

.4 Maintain specified differential pressure.

.5 Stop contaminated work and take corrective action if pressure differential drops below the specified level. Notify the Abatement Consultant immediately.

1.18 Waste and Material Handling

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

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

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

.4 Clean, wash and apply Post Removal Sealant to metal waste prior to removal from Abatement Work Area. Recycle metals.

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

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

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

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

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

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

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

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

.3 Wet wipe outside of Waste Container.

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

.5 Remove waste containers and transport to appropriate bin.

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

.12 Use Low Risk Procedures while transporting asbestos waste through facility.

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

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

.15 Transport hazardous waste to landfill or waste transfer station in accordance with provincial requirements.

.16 Cooperate with representatives of the provincial Ministry of the Environment and Parks and immediately carry out instructions for remedial work at the landfill, at no additional cost to the Owner.

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 Refer to the Sections identified in 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 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of materials.

.5 Asbestos Waste Container: A container acceptable to the landfill and the provincial Ministry of the Environment and Parks, that is:

.1 Dust tight.

.2 Suitable for the type of waste.

.3 Impervious to asbestos.

.4 Identified as asbestos waste.

.6 Differential Pressure Monitor: a high precision instrument for measuring and controlling pressure differences in the low range, between the Abatement Work Area and Occupied Area. Calibrate regularly to manufacturer's instructions.

.7 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.

.8 Ground Fault Panel: Electrical panel as follows:

.1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical 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 square metres) of Abatement Work Area.

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

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

.2 Pressure differential gauge to monitor filter loading.

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

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

.10 HEPA Vacuum: Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.

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

.12 Lead Waste Container: An impermeable container acceptable to the landfill and the provincial Ministry of the Environment and Parks, that is:

.1 Dust tight.

.2 Suitable for the type of waste.

.3 Evaluated for leachable lead content and disposed of in accordance with applicable regulations.

.1 Where lead waste exceeds 5.0 mg/L of lead in the TCLP analysis, label as lead waste and dispose of as hazardous waste in a Class I landfill.

.2 Where lead waste is below 5.0 mg/L of lead in the TCLP analysis, disposed of as construction waste in a Class II landfill.

.13 OSB: Oriented Strand Board.

.14 Polyethylene Sheeting : 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.

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

.16 Protective Clothing: Disposable coveralls complete with head covering and full body covering that fits snugly at the ankles, wrists and neck.

.17 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.

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

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

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

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

PART 3 EXECUTION

.1 Refer to the Sections identified in Related Work for specified procedures for work area preparation, maintenance, site dismantlement, application of lock-down agent 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 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of asbestos-containing materials following Low Risk procedures, as well as Pinchin and Owner specific requirements.

1.3 Instruction and Training

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

.1 Hazards of asbestos.

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

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

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

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

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

1.4 Personal Protection

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

.1 Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.

.2 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

.1 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

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

1.5 Inspections

.1 Refer to Part 1.12 Inspections in Section 02 81 00 – General Provisions.

.2 The following Milestone Inspections are to be scheduled:

.1 Milestone Inspection - Clean Site Preparation

.2 Milestone Inspection – Bulk Removal Inspection

.3 Milestone Inspection - Visual Clearance

.4 Milestone Inspection – Clearance Sampling

.5 Milestone Inspection – Dismantling Inspection

PART 2 PRODUCTS AND FACILITIES

.1 Refer to Section 02 81 00.

PART 3 EXECUTION

3.1 Site Preparation

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

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

.3 Install polyethylene sheeting on openings in walls and floors (as required) and seal.

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

.5 Provide power from ground fault interrupt circuits.

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

.7 Without disturbing asbestos-containing materials, remove and dispose of non-hazardous materials as clean waste prior to asbestos removal work, where possible.

3.2 Maintenance of Abatement Work Area

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

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

.3 Maintain Abatement Work Area in tidy condition.

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

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

3.3 Asbestos Removal - General

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

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

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

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

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

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

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

sweeping or mopping.

3.4 Asbestos Removal - Vinyl Asbestos Tile

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

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

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

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

.5 Scrape up adhesive remaining on floor with a hand scraper until only a thin smooth film remains.

.6 Use a hot air gun where deposits are heavy or difficult to scrape.

.7 Deposit scrapings into asbestos waste disposal bag.

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

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

.1 Wet all material to be disturbed.

.2 Undo fasteners if necessary to remove material.

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

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

.5 Scrape to remove material adhered to substrate.

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

3.6 Abatement Work Area Dismantling

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

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

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

.4 Wet drop sheets and polyethylene sheeting.

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

.6 Remove remaining polyethylene sheeting and tape.

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

3.7 Waste and Material Handling

.1 Refer to Section 02 81 00.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Remove and dispose of the following materials as clean waste prior to asbestos removal work without disturbing asbestos-containing materials:

.1 Carpet, thresholds, tack strips and underpad.

.2 Millwork and cabinets.

.3 Doors and door hardware.

.2 Using Moderate Risk procedures of this section, remove and dispose of the following:

.1 Asbestos-containing exterior stucco in the following locations:

.1 1000 Hunter Drive, concealed under siding.

.2 105 4 Street W.

.2 Drywall with drywall joint compound containing asbestos, fasteners, strapping, hangers and studs in the following locations:

.1 964 Hunter Drive.

.3 Asbestos-containing plaster, lath, strapping, studs, in the following locations:

.1 1000 Hunter Drive, main floor walls and ceilings.

1.3 Instruction and Training

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

.1 Hazards of asbestos.

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

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

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

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

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

1.4 Personal Protection

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

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

.2 Provide workers, at a minimum, with full face respirators with P100 high

efficiency (HEPA) cartridge filters, for:

.1 Removal of all or part of a ceiling if asbestos is likely lying on the surface.

.2 Use of a HEPA filtered power tool on non-friable ACM if the material is not wetted.

.3 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

.1 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

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

1.5 Inspections

.1 Refer to Part 1.12 Inspections in Section 02 81 00 – General Provisions.

.2 The following Milestone Inspections expectations are to be scheduled:

.1 Milestone Inspection - Clean Site Preparation

.2 Milestone Inspection – Bulk Removal Inspection

.3 Milestone Inspection - Visual Clearance

.4 Milestone Inspection – Clearance Sampling

.5 Milestone Inspection – Dismantling Inspection

PART 2 PRODUCTS AND FACILITIES

.1 Refer to Section 02 81 00.

2.2 Hoarding Walls

.1 Type A Hoarding Wall: One layer of rip-proof polyethylene sheeting installed floor to ceiling, secured with telescopic poles, clips, or other suitable methods.

.2 Type B Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of rip-proof polyethylene sheeting on each side of wall.

.3 Type C Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of polyethylene sheeting on each side of wall. Install 13 mm OSB, plywood or gypsum board over polyethylene sheeting on Occupied Area side. Paint Occupied Area side of plywood, OSB, or gypsum board with one coat of primer and one coat of flat white latex.

.4 Windows: Install sufficient transparent windows area in hoarding walls to allow observation of entire work area from outside the enclosure where existing solid walls do not make up the perimeter.

2.3 Clean Room

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

.2 Install walls as follows:

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

plates.

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

.3 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting on floor.

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

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

.5 Install a fire extinguisher, mount to wall.

2.4 Curtained Doorways

.1 Construct as follows:

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

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

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

.4 Provide direction arrows on flaps to indicate opening.

PART 3 EXECUTION

3.1 Site Preparation - General

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

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

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

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

.3 Provide power from ground fault interrupt circuits.

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

3.2 Site Preparation –Enclosure Required

.1 Install polyethylene enclosure, complete with Windows, at Abatement Work Area:

.2 Install Transfer Room.

.3 Install Curtained Doorways.

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

.5 Seal openings in floor using tape, caulking, polyethylene, etc. Floor openings are to be sealed independently prior to installation of floor polyethylene.

.6 Install polyethylene sheeting on floors of Abatement Work Area. Use enough layers to provide adequate protection for carpeting and equipment.

.1 Minimum requirement over carpet is one layer of 6 mil polyethylene under one

layer of rip-proof polyethylene.

.2 Cover floors first so that polyethylene on walls is overlapped by at least 305 mm.

.7 Install 6 mil polyethylene sheeting on walls within the Abatement Work Area., including existing walls that make up, or are within, the Abatement Work Area.

.8 Provide a completely sealed polyethylene ceiling for free standing enclosures.

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

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

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

.1 Provide enough HEPA filtered negative pressure machines to exchange a volume of air equivalent to that of the Abatement Work Area a minimum of every 15 minutes.

.2 Arrange negative air units to maximize the distance between units and decontamination facilities.

.3 Provide weighted flaps in perimeter Hoarding Walls as necessary to provide make-up air.

.4 Operate HEPA filtered negative pressure machines continuously from first disturbance of ACM until completion of dismantling.

.5 Replace prefilters to maintain specified flow rate.

.6 Replace HEPA filter as required to maintain flow rate and integrity of unit.

.7 Discharge HEPA filtered negative air machines as follows:

.1 To building exterior.

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

.2 Install panel securely in window frame so that it cannot be pushed into the building and make weather-tight with caulking.

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

.4 Direct discharge away from building access points.

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

.9 Install and make airtight all negative air discharge ducting running through occupied areas.

.12 Place required tools to complete the abatement with the Abatement Work Area.

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

3.3 Site Preparation – No Enclosure Required

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

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

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

.4 Install temporary lighting in Abatement Work Area to a level that will provide for safe and efficient use of Work Area - minimum 550 LUX.

.5 Place HEPA vacuum in Abatement Work Area.

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

3.4 Maintenance of Abatement Work Area

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

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

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

.4 Maintain Abatement Work Area in tidy condition.

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

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

3.5 Asbestos Removal - General

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

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

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

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

3.6 Asbestos Removal - Drywall with Asbestos Drywall Joint Compound (greater than 1 square foot of drywall joint compound)

.1 Construct an enclosure around Abatement Work Area and use the procedures described above under *Site Preparation –Enclosure Required*.

.2 Cut drywall and remove using non-powered hand-held tools. Place directly into polyethylene waste bag.

.3 Remove all screws and fasteners in studs or strapping.

.4 Remove studs and strapping where specified. Clean metal studs and remove from Abatement Work Area.

.5 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.7 Asbestos Removal – Plaster and Stucco (greater than 1 square foot of plaster and stucco)

.1 Construct an enclosure around Abatement Work Area and use the procedures described above under *Site Preparation –Enclosure Required*.

.2 Cut plaster and stucco and remove using non-powered hand-held tools. Place directly into polyethylene waste bag.

.3 Remove all screws and fasteners in studs or strapping.

.4 Remove studs and strapping where specified. Clean metal studs and remove from Abatement Work Area.

.5 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.8 Asbestos Removal - Other Non-Friable Asbestos Materials with HEPA Filtered Power Tools

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

.2 Wet all material to be disturbed.

.3 Undo fasteners if necessary to remove material.

.4 Use hand held powered tools with a HEPA filtered dust collection device to remove, cut, grind, abrade, break or vibrate ACM.

.5 Scrape to remove any remaining material adhered to substrate.

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

.7 Wet clean or HEPA vacuum the entire Abatement Work Area, including surfaces not covered with polyethylene sheeting. Any materials or equipment removed to access ACM that are to be reused, must be wet cleaned or vacuumed prior to reinstatement.

3.9 Asbestos Removal - Dust and Debris

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

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

3.10 Application of Post Removal Sealant

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

.2 Do not apply post removal sealant to materials that will be damaged by its application.

3.11 Air Clearance Monitoring

.1 Air clearance monitoring will be conducted in situations where an enclosure has been constructed around the Abatement Work Area.

.2 Site must be dry prior to Air Clearance Monitoring.

.3 Restrict access to Abatement Work Area and operate negative air units for an 8-hour period prior to Milestone Inspection – Clearance Sampling.

.4 The HEPA filtered negative pressure machines shall be in operation during clearance air monitoring.

.5 In the presence of the Abatement Consultant, immediately prior to air clearance monitoring, use a leaf blower to dislodge loose fibre.

.1 Direct leaf blower against walls, ceilings, floors, and other surfaces.

.2 Perform this for at least five minutes per 1,000 sq. ft. of Abatement Work Area.

.6 PCM samples will be collected as per Air Monitoring Section.

3.12 Abatement Work Area Dismantling

.1 Use Low Risk worker precautions during dismantling.

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

.3 Place tools and equipment used in contaminated work site but not cleaned in polyethylene bags prior to removal from Abatement Work Area.

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

.5 Wet drop sheets and polyethylene sheeting.

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

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

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

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

.10 Remove Transfer Room.

.11 Remove seals, tape, Signage etc.

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

.13 Seal openings in HEPA vacuums.

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

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

.16 Remove temporary lights.

.17 Remove ground fault panels.

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

3.13 Waste and Material Handling

.1 Refer to Section 02 81 00.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to the hazardous materials reports provided for the extent of the Abatement Work Areas.

.2 Without disturbing asbestos-containing materials, remove and dispose the following materials as clean waste prior to asbestos removal work:

.1 Carpet, thresholds, tack strips and underpad.

.2 Millwork and cabinets.

.3 Doors and door hardware.

.3 Using High Risk procedures of this section, remove and dispose of the following:

.1 Vermiculite insulation.

.2 Drywall ceiling, channels, supports and hangers.

.3 Texture coat and overspray.

.4 Non-asbestos mechanical insulations.

.5 Ceilings and bulkheads, grids, support systems.

.6 Flexible ducts.

.7 Diffusers.

.8 Light fixtures, lamps and ballasts.

.9 All electrical services including but not limited to conduit, bx cable, junction

1.3 Personal Protection

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

.2 Provide the following respiratory protection to all personnel:

.1 Full Face Powered Air Purifying Respirators (PAPR) with P100 high efficiency (HEPA) cartridge filters

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

.3 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

.1 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

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

1.4 Differential Pressure Monitoring

.1 Install differential pressure monitor at a location chosen by the Abatement Consultant.

.2 Co-operate with the Abatement Consultant in collection of pressure monitoring data.

.3 Maintain specified differential pressure at monitoring location. Negative air pressure is to be -0.02 inches of water, relative to the area outside the enclosed area.

1.5 Inspections

.1 Refer to Part 1.12 Inspections in Section 02 81 00 – General Provisions.

.2 The following Milestone Inspections are to be scheduled:

.1 Milestone Inspection - Clean Site Preparation

.2 Milestone Inspection – Bulk Removal Inspection

.3 Milestone Inspection - Visual Clearance

.4 Milestone Inspection – Clearance Sampling

.5 Milestone Inspection – Dismantling Inspection

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 Refer to Section 02 81 00.

2.2 Hoarding Walls

.1 Type A Hoarding Wall: One layer of rip-proof polyethylene sheeting installed floor to ceiling, secured with telescopic poles, clips, or other suitable methods.

.2 Type B Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of rip-proof polyethylene sheeting on each side of wall.

.3 Type C Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of polyethylene sheeting on each side of wall. Install 13 mm OSB, plywood or gypsum board over polyethylene sheeting on Occupied Area side. Paint Occupied Area side of plywood, OSB, or gypsum board with one coat of primer and one coat of flat white latex.

.4 Type D Hoarding Wall: 1 Hour rated partition to ULC Design W407. Floor to deck, 38 mm x 89 mm metal studs at 400 mm o/c with continuous sill and top plate, complete with mineral wool batts in cavity, covered with 16 mm Type X gypsum wall board both sides, taped and mudded joints, with acoustic sealant at top and bottom of plates, both sides. Install 2 layers of 6 mil polyethylene sheeting on Abatement Work Area side. Paint Occupied Area side of board with one coat of primer and one coat of flat white latex.

.5 Type E Hoarding Wall: Construct as per Type C using exterior grade plywood and insulate wall cavity with R 12 fibreglass batts insulation.

.6 Type F Hoarding Wall: Upper perimeter hoarding wall - 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with 2 layers of polyethylene sheeting on Abatement Work Area side. Anchor wall to underside of structure and extend down to top of ceiling or top of wall/hoarding wall below. Install wall under contaminated conditions.

.7 Windows: Install enough transparent windows in hoarding walls to allow observation of entire work area from outside the enclosure where existing solid walls do not make up the perimeter.

2.3 Decontamination Facilities

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

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

.2 Contaminated Change Room: Room between the Shower Room and Abatement Work Area.

.1 Locate on the contaminated side of Shower Room.

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

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

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

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

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

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

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

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

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

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

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

.5 Install sump pumps, sufficient for volume of waste shower water from showers and drip pan. Direct waste shower water to sanitary drains. Water must pass through a 10 micrometer filter before it is directed to the sanitary drain.

.6 Install ground fault protected power switch on clean side of shower for sump pump shut off.

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

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

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

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

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

.3 Install a hose bib on domestic cold-water piping to provide a connection on the clean side of Abatement Work Area.

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

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

.6 Install a fire extinguisher, mount to wall.

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

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

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

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

.6 Container Cleaning Room: Room between Abatement Work Area and Holding Room of sufficient size to allow proper washing of equipment and waste containers or double bagging of asbestos waste. All wash water shall be treated as asbestos contaminated waste.

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

.1 Install a fire extinguisher mounted to wall.

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

.9 Construction of Decontamination Facilities

.1 Install floor protection as follows:

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

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

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

.2 Install walls as follows:

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

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

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

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

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

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

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

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

.3 Install roof as follows:

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

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

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

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

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

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

.10 Curtained Doorways

.1 Construct as follows:

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

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

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

.4 Provide direction arrows on flaps to indicate opening.

PART 3 EXECUTION

3.1 Clean Site Preparation

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

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

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

.4 Remove surface-mounted fixtures specified to be reused or turned over to Owner.

.5 Install platforms in areas specified.

.6 Install tunnels in areas specified.

.7 Install Hoarding Walls between Abatement Work Area and Occupied Area.

.8 Install Worker Decontamination facility.

.1 Worker Decontamination Facility to be located within the Abatement Work Area.

.9 Install Waste Decontamination facility.

.1 Waste Decontamination Facility to be located within the Abatement Work Area.

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

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

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

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

.13 Establish negative pressure in Abatement Work Areas as follows:

.1 Discharge HEPA filtered negative pressure machines as follows:

.1 To building exterior.

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

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

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

.4 Cover duct opening with chicken wire.

.5 Direct discharge away from building access points.

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

.14 Install Ground Fault Panel.

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

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

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

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

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

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

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

.19 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting, on floor surfaces in Abatement Work Area.

.1 Install additional layers of rip-proof polyethylene and/or plywood to protect carpeted floor surfaces.

.2 Extend floor protection a minimum of 300 mm up all vertical surfaces in the Abatement Work Area.

.20 On walls within, and forming the perimeter of the Abatement Work Area, install two layers of 6 mil polyethylene sheeting.

.1 At the junction of floor and wall surfaces, overlap floor polyethylene with wall polyethylene by a minimum of 300 mm at each layer. One layer of wall polyethylene must always overlap the top layer of floor polyethylene.

.21 Notify Abatement Consultant to the need for Milestone Inspection - Clean Site Preparation. Obtain written approval for this Milestone Inspection before proceeding.

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

.23 Post provincial Asbestos Project Notification documentation.

3.2 Maintenance of Contaminated Abatement Work Area

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

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

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

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

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

.6 Maintain Abatement Work Area in tidy condition.

.7 Remove waste and debris frequently.

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

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

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

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

3.3 Wet Removal

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

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

.3 Spray asbestos-containing sprayed or trowelled material with Amended Water using airless spray equipment prior to removal. Saturate ACM to prevent release of airborne fibres during removal.

.4 Remove asbestos-containing sprayed or trowelled material specified to be removed, clean substrate.

.1 Fully saturated ACM may be scraped directly into waste containers or may be allowed to fall to floor.

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

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

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

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

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

.7 Spray asbestos-containing duct and mechanical equipment insulations with Amended Water using airless spray equipment.

.8 Remove exterior duct and mechanical equipment insulations specified to be removed and clean substrate. Maintain exposed surfaces of insulation in a wet condition.

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

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

.9 Remove obstructions as required to remove the ACM.

.1 Notify Abatement Consultant if item is not specified to be removed and inhibits removal of ACM.

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

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

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

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

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

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

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

.4 Remove wash water as contaminated waste.

.5 Remove waste.

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

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

.13 Notify Abatement Consultant to the need for Milestone Inspection - Visual Clearance.

3.4 Waste and Material Handling

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

.14 Use Low Risk Procedures while transporting waste through facility.

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

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

.17 Transport asbestos contaminated waste in accordance with the requirements of Alberta Environment.

3.5 Application Of Post Removal Sealant

.1 Wet Removal

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

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

.1 Do not apply post removal sealant to materials that will be damaged by its application.

.3 Notify Abatement Consultant to the need for Milestone Inspection – Clearance Sampling.

3.6 Air Clearance Monitoring

.1 Site must be dry prior to Air Clearance Monitoring.

.2 The minimum number of Air Clearance Monitoring samples will be as follows:

.1 1 sample for less than 100 square metres.

.2 2 samples for 100 to 500 square metres.

.3 3 samples for more than 500 square metres.

.3 Prior to air clearance monitoring, install clean 20-inch fans for air circulation during Air Clearance Monitoring.

.1 At least one fan per 10,000 cubic feet of space in Abatement Work Area.

.2 Install in centre of Abatement Work Area and space evenly.

.3 The fan exhaust shall be directed upwards or toward the ceiling.

.4 The fans shall be operated on the lowest speed setting.

.4 Restrict access to Abatement Work Area and operate negative air units for an 8 hour period prior to Milestone Inspection – Clearance Sampling.

.5 The HEPA filtered negative pressure machines shall be in operation during clearance air monitoring.

.6 In the presence of the Abatement Consultant, immediately prior to air clearance monitoring, use a leaf blower to dislodge loose fibre.

.1 Direct leaf blower against walls, ceilings, floors, and other surfaces.

.2 Perform this for at least five minutes per 1,000 sq. ft. of Abatement Work Area.

.7 PCM samples will be collected as per Air Monitoring Section.

3.7 Abatement Work Area Dismantling

.1 Use Low Risk worker precautions during dismantling.

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

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

.4 Clean Abatement Work Area, Equipment and Access area, Washing/Showering Room.

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

.6 Remove top layer of polyethylene sheeting from surfaces protected by two or more layers of polyethylene sheeting. The bottom layer of polyethylene will remain until all re-fireproofing is complete. Remove outer layer as follows:

.1 Remove asbestos contaminated Polyethylene by carefully rolling away from walls to centre of Abatement Work Area.

.2 Cut the lower layer of polyethylene sheeting to expose the baseboards, window sills, cabinets, shelves and other horizontal surfaces that may be contaminated by fallen ACM.

.3 Remove visible fibres or residue found during removal of polyethylene using a HEPA vacuum.

.4 Remove polyethylene protection and hoarding walls where hoarding walls separate occupied areas from work area. Hoarding walls to remain are identified on asbestos demolition drawings.

.7 Remove top layer of polyethylene on walls, finishes, and equipment.

.8 Remove remaining polyethylene sheeting.

.9 Remove water hoses and shut off at source.

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

.11 Seal vacuum hoses and fittings, flexible ductwork and all tools used in contaminated work site in 6 mil polyethylene bags prior to removal from Work Area.

.12 Remove temporary lights.

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

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

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

.16 Notify Abatement Consultant to the need for Milestone Inspection - Dismantling Inspection.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to the provided hazardous materials reports for the extent of the Abatement Work Areas.

.2 Remove and dispose of the following materials as clean waste prior to abatement work without disturbing lead-containing materials:

.1 Carpet, thresholds, tack strips and underpad.

.2 Millwork and cabinets.

.3 Doors and door hardware.

.3 Comply with requirements of this Section when performing following Work (Low Risk):

.1 Operating construction equipment (i.e., excavator, bulldozer; within the cab) during building demolition or renovation where lead-containing paints are present.

.2 Installation or removal of batteries, lead sheeting, flashings, packing, babbits, caulking, gaskets or similar.

.3 Installation or removal of bolts covered in lead-based paint.

.4 Application of lead-containing paint with a brush, roller or sponge.

.4 Comply with requirements of this Section when performing the following Work (Low-Moderate Risk):

.1 Removal of materials coating with lead-containing paints, using non-powered hand tools, where the materials remain primarily intact, and is not crumbled, pulverized or powdered.

.2 Removal of lead materials using power tools with a dust collection system and HEPA filters.

.5 Comply with requirements of this Section when performing the following Work (Moderate Risk):

.1 Removal of lead-containing paint by hand with a chemical gel, stripper or paste.

.2 Removal of lead-containing paints by hand with a heat gun.

1.3 Instruction and Training

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

.1 Hazards of lead.

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

abatement work, including:

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

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

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

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

1.4 Personal Protection

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

.1 Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.

.2 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

.1 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

.2 Dust impermeable gloves appropriate for the work being completed.

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

.3 Lead-specific soaps and hygiene indicators are recommended to be provided for hand-wash stations.

PART 2 PRODUCTS AND FACILITIES

.1 Refer to Section 02 81 00.

PART 3 EXECUTION

3.1 Site Preparation

.1 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

.2 Stored or non-fixed items, including but not limited to equipment, furniture, waste etc., shall be removed from the Abatement Work Area prior to abatement work.

.1 Install one layer of polyethylene sheeting on walls, floors, finishes, millwork, electrical equipment, equipment and furnishings remaining in the Abatement Work Area.

.2 Install polyethylene drop sheets below areas of work.

.3 Install polyethylene sheeting on openings in walls and floors (as required) and seal.

.4 Install barriers and signage in clearly visible locations and in sufficient number to adequately warn of a lead dust hazard.

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

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

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

.6 Remove visible dust from all surfaces in the Abatement Work Area including those to be worked on, using HEPA Vacuums or wet wiping.

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

.8 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.

.1 Ensure safe installation of electrical lines and equipment.

3.2 Maintenance of Abatement Work Area

.1 Maintain Abatement Work Area in tidy condition.

.2 Remove waste and debris frequently.

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

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

3.3 Lead-Containing Paint Abatement

.1 Removal methods minimizing dust generation should be used wherever possible.

.1 Wet methods are to be used to reduce dust generation.

.2 Wetting agents should be used where possible.

.3 Wet method is not to be used if it creates a hazard or cause damage to equipment or to building finishes.

.2 Wastewater from cleaning or removal operations must be contained, for treatment or disposal.

.3 Remove lead-based paint in small sections and pack as it is being removed in sealable lead waste containers.

.4 Follow manufacturer’s instructions for all use of chemical gels, strippers and pastes.

.1 Ensure agent neutralizers, were required, are applied.

.5 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.

.6 After wire brushing and wet sponging to remove visible lead-based paint, wet clean entire Work Area, and equipment used in process.

.1 Compressed air or dry sweeping must not be used to clean up lead-containing dust or waste.

.2 Ensure all waste is cleaned and packaged.

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

.8 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. Wash containers thoroughly pending removal to outside.

3.4 Bulk Lead Removal

.1 Remove and recycle lead-containing batteries.

.2 Remove cast-iron pipes with bell and spigot joints intact. Metal pipes should be recycled.

3.5 Waste Management and Disposal

.1 Per Section 02 81 00.

3.6 Final Cleaning

.1 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.

.2 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.

.3 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

END OF SECTION

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PART 1 GENERAL

.1 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to the provided hazardous materials reports for the extent of the Abatement Work Areas.

.2 Remove and dispose of the following materials as clean waste prior to abatement work without disturbing lead-containing materials:

.1 Carpet, thresholds, tack strips and underpad.

.2 Millwork and cabinets.

.3 Doors and door hardware.

.3 Comply with requirements of this Section when performing the following Work (Moderate Risk):

.1 Removal of lead-containing paint with a chemical gel, stripper or paste.

.2 Removal of lead-containing paints with a heat gun.

.3 Removal of lead-containing paint with laser ablation technology.

.4 Scraping or sanding lead-containing coatings using non-powered hand tools where significant disturbance will take place.

.5 Manually demolishing lead-painted plaster walls or building components using a sledgehammer or similar tool.

.6 Cleaning up and removing lead-containing dust and debris.

.4 Comply with requirements of this Section when performing the following Work (Moderate-High Risk):

.1 Using a powered cutting device for dry removal of mortar that contains lead.

.2 Removing lead-containing coatings using a power tool without a HEPA filtered dust collection system.

.3 Demolishing or cleaning up facilities where lead-containing products were manufactured.

.4 Removal of lead-containing paints using high pressure water jet.

1.3 Instruction and Training

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

.1 Hazards of lead.

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

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

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

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

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

1.4 Personal Protection

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

.1 Provide the following respiratory protection to all personnel, at minimum:

.1 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.

.2 Non-powered full-face respirators with P100 high efficiency (HEPA) cartridge filters.

.3 Powered full-face respirators with P100 high efficiency (HEPA) cartridge filters.

.2 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

.1 Dust impermeable gloves appropriate for the work being completed.

.2 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

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

.3 Lead-specific soaps and hygiene indicators are recommended to be provided for shower and hand-wash stations.

PART 2 PRODUCTS AND FACILITIES

.1 Refer to Section 02 81 00.

2.2 Hoarding Walls

.1 Type A Hoarding Wall: One layer of rip-proof polyethylene sheeting installed floor to ceiling, secured with telescopic poles, clips, or other suitable methods.

.2 Type B Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of rip-proof polyethylene sheeting on each side of wall.

.3 Type C Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of polyethylene sheeting on each side of wall. Install 13 mm OSB, plywood or gypsum board over polyethylene sheeting on Occupied Area side. Paint Occupied Area side of plywood, OSB, or gypsum board with one coat of primer and one coat of flat white latex.

.4 Windows: Install sufficient transparent windows area in hoarding walls to allow observation of entire work area from outside the enclosure where existing solid walls do not make up the perimeter.

2.3 Clean Room

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

.2 Install walls as follows:

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

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

.3 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting on floor.

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

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

.6 Install a fire extinguisher, mount to wall.

2.4 Shower Room

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

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

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

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

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

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

.5 Install ground fault protected power switch on clean side of shower for sump pumps shut off.

.6 Provide adequate quantity of soap, shampoo, and clean towels.

2.5 Curtained Doorways

.1 Construct as follows:

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

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

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

.4 Provide direction arrows on flaps to indicate opening.

PART 3 EXECUTION

3.1 Site Preparation - General

.1 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

.2 Stored or non-fixed items, including but not limited to equipment, furniture, waste, etc., shall be removed from the Abatement Work Area prior to abatement work.

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

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

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

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

.5 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.

.1 Ensure safe installation of electrical lines and equipment.

3.2 Site Preparation –Enclosure

.1 Install Curtained Doorways.

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

.3 Seal openings in floor using tape, caulking, polyethylene, etc. Floor openings are to be sealed independently prior to installation of floor polyethylene.

.4 Install polyethylene sheeting on floors of Abatement Work Area. Use sufficient layers to provide adequate protection for carpeting and equipment.

.1 Minimum requirement over carpet is one layer of 6 mil polyethylene under one layer of rip-proof polyethylene.

.2 Cover floors first so that polyethylene on walls is overlapped by at least 305 mm.

.5 Install 6 mil polyethylene sheeting on walls to remain, within the Abatement Work Area., including existing walls that make up, or are within, the Abatement Work Area.

.6 Install one layer of 6 mil polyethylene sheeting so as to protect all equipment and finishes in the Abatement Work Area that may be damaged.

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

.8 Establish negative pressure in Abatement Work Areas as follows:

.1 Provide sufficient HEPA filtered negative pressure machines to exchange a volume of air equivalent to that of the Abatement Work Area a minimum of every 15 minutes.

.2 Provide additional HEPA filtered negative pressure machines as required to ensure air flow from Occupied Area into Abatement Work Area.

.3 Operate HEPA filtered negative pressure machines continuously from first disturbance of lead-containing materials until completion of dismantling.

.4 Replace prefilters to maintain specified flow rate.

.5 Replace HEPA filter as required to maintain flow rate and integrity of unit.

.6 Discharge HEPA filtered negative air machines to building exterior, where possible. Direct discharge away from building access points.

.9 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of lead hazard, and lead hazard where appropriate.

3.3 Maintenance of Abatement Work Area

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

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

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

.4 Maintain Abatement Work Area in tidy condition.

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

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

3.4 Lead-Containing Paint Abatement

.1 Removal methods minimizing dust generation should be used wherever possible.

.1 Wet methods are to be used to reduce dust generation.

.1 Wetting agents should be used where possible.

.2 Wet method is not to be used if it creates a hazard or cause damage to equipment or to building finishes.

.2 Provide drop sheets below all lead operations that may produce dust, chips or debris containing lead.

.3 Wastewater from cleaning or removal operations must be contained, for treatment or disposal.

.4 Remove lead-based paint in small sections and pack as it is being removed in sealable waste containers.

.5 Waste generated should be maintained wet until cleaned and packaged.

.6 Follow manufacturer’s instructions for all use of chemical gels, strippers and pastes.

.1 Ensure agent neutralizers, were required, are applied.

.7 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.

.8 After wire brushing and wet sponging to remove visible lead-based paint, wet clean entire work area, and equipment used in process.

.1 Compressed air or dry sweeping must not be used to clean up lead-containing dust or waste.

.2 Ensure all waste is cleaned and packaged.

.9 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. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.

3.5 Waste Management and Disposal

.1 Per Section 02 81 00.

3.6 Final Cleaning

.1 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and seal. Dispose of in accordance with waste materials generated.

.2 Clean Work areas, Clean Room, and Transfer Room, where present.

.3 Remove sealed waste containers and equipment used in Work and remove from work areas at appropriate time in cleaning sequence.

.4 Conduct final check to ensure no dust or debris remain on surfaces as result of dismantling operations.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Unless otherwise shown or specified it is the intent that work performed as per this section will result in the removal and destruction of:

.1 PCB-containing ballasts

.2 All Work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent shall apply.

1.3 Quality Assurance

.1 Ensure the removal and handling of PCBs is performed by persons experienced in the relevant methods, procedures and industry practices.

.2 Complete work so that at no time do PCBs contaminate the building or environment.

1.4 Instruction and Training

.1 Instruction and training must be provided to all workers and supervisors. Instruction and training include the following:

.1 Hazards of PCBs.

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

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

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

.4 The measures and procedures prescribed by this section.

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

1.5 Personal Protection

.1 Workers handling PCB-containing materials are advised to avoid skin and eye contact.

.2 During removal of PCBs, personnel are to wear personal protective equipment appropriate to the task.

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

1.6 Inspections

.1 Refer to Part 1.12 Inspections in Section 02 81 00 – General Provisions.

.2 The following Milestone Inspections are to be scheduled:

.1 Milestone Inspection - Clean Site Preparation

.2 Milestone Inspection – Bulk Removal Inspection

.3 Milestone Inspection - Visual Clearance

PART 2 PRODUCTS

2.1 Materials

.1 Containment Drums: new, not used double bung 45-gallon No. 16 gauge cold rolled steel drums with removable steel lid, PCB resistant gasket (nitrile rubber, cork or Teflon), and 12-gauge compression type ring closure with 5/8" bolt and forged lug. Drums shall be newly painted inside and out with bright white rust-resistant enamel. Metal pail of 16-gauge steel with removal steel lid, are also acceptable for smaller quantities of waste.

.2 Decontamination Area: An established area for the purpose of decontaminating personnel and equipment.

.1 Of sufficient size to accommodate cleaning of equipment and removing personal protective equipment.

.2 Install PCB warning signs / tape at the entrance to the decontamination area.

.3 The floor shall be covered with polyethylene sheeting.

.4 Include a hand washing station complete with soap and towels and 6 mil polyethylene bags for disposal of PCB-contaminated items such as gloves, Tyvek suits, rags etc.

.5 All personnel must enter and exit the Abatement Work Area through the decontamination area.

.6 All equipment and surfaces of waste containers must be cleaned prior to removing them from the decontamination room or area.

.7 Work clothing must be cleaned with a HEPA vacuum before it is removed.

.3 Drum liners: clear polyethylene bag, 36" x 60", 6 mil thick. Open one 36" end.

.4 Label: appropriate PCB Labels and Placards of sufficient size to be clearly legible, for display on waste containers (bags, boxes, rolloffs or drums) which will be used to contain or transport PCB contaminated material, in accordance with TDG regulations.

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

PART 3 EXECUTION

3.1 General

.1 Do not contaminate building surfaces with PCBs.

.2 Should visible PCB debris be observed outside the Work Area, immediately stop Work, notify the Consultant and Owner and institute emergency procedures as directed. All costs incurred in decontaminating such non-Work Areas and the contents thereof shall be borne by the contractor, at no additional cost to the Owner.

.3 Notify Owner's Representative of any spills immediately.

.1 Any spills of PCBs are to be cleaned to the satisfaction of the Owner's Representative at the contractor's cost. This includes removal and replacement of building materials as required.

.4 Conduct PCB removal operations in a matter that fully protects Contractor's and Subcontractor's employees, the general public, other building occupants and the environment from exposure to PCB.

.5 Non-PCB items remaining such as windows, doors, masonry, and all other building construction and components from which PCB materials are removed shall be decontaminated by physical or chemical means such that no visible residue remains. The removal of the PCB materials may require the use of scrapers, solvents, mastic removal chemicals, or other methods/procedures to ensure complete removal.

3.2 Removal of Ballasts

.1 Contractor is responsible for determining the actual quantity of ballasts to be disposed as PCB waste.

.2 Prior to removing any fixtures, ensure electrical service is isolated at panel, and disconnect existing power supply to electrical equipment.

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

.3 Remove the following:

.1 Lenses at light fixtures.

.2 Mercury vapour lamps (refer to Section 02 87 00).

.3 Light fixtures.

.4 Ballasts.

.4 Install polyethylene drop sheets in packaging area to protect surfaces and finishes.

.5 Avoid rough handling of PCB ballasts. Do not drop or throw.

.6 Identify ballasts as either non-PCB or PCB containing.

.1 All ballasts not clearly labelled as “NO PCB” are to be treated as PCB containing.

.2 Non-PCB ballasts to be recycled or disposed as solid non-hazardous waste.

.7 Place PCB waste on polyethylene drop sheets immediately after removal.

.8 Package PCB-containing ballasts in Containment Drums, or on wood skids.

.1 Place ballasts on end in Containment Drum. When full:

.1 Seal liner bag with duct tape.

.2 Seal drum with lid, gasket and compression ring.

.3 Affix specified and completed label.

.4 Do not leave liner bags or drums open overnight.

.2 Shrink wrap ballasts and wood skid to prevent movement during transport.

.9 Transport packaged PCB waste to a Ministry of the Environment and Parks approved incineration facility and destroy.

3.3 Work Area Preparation - Exterior Removal:

.1 Take appropriate precautions (e.g. install windscreens) to prevent dust and debris from migrating due to windy conditions.

.2 All work platforms and ground surfaces exterior to the work area shall have a layer of 6 mil fire retardant plastic sheeting, attached to the building face and laid down on the surface below the exterior abatement work area, at least 10 feet wide or to the furthest point of gravity fall for dislodged debris by methods used, whichever is further.

.3 For work at the second storey and above, extend 6 mil fire retardant plastic sheeting as necessary.

.4 For work above third storey, by sidewalk, street, or property boundary, scaffolding sides shall be covered in 6-mil fire retardant plastic sheeting.

.5 All operable windows within the work area and 25 ft from all sides of the work area shall be closed.

3.4 Work Area Preparation - Interior Removal:

.1 All floor areas adjacent to the work area shall have a layer of polyethylene sheeting, attached to the interior wall and laid down on the surfaces below the abatement work area, at least 5 feet wide or to the furthest point of gravity fall for dislodged debris by methods used, whichever is further.

.2 All movable objects shall be removed from the immediate work area. All non-movable objects shall be covered with one layer of polyethylene sheeting and sealed at the edges.

.3 All operable windows within the work area shall be closed.

.4 Temporary dust barriers consisting of a minimum of polyethylene sheeting shall be at installed at hallways, corridors, doorways, and other openings to the work area not used for passage during removals to establish work area containment enclosure.

.5 Polyethylene sheeting overlapping curtained doorway shall be installed at the entrance to the work area.

3.5 Equipment and Area Decontamination

.1 When removal of PCB materials is completed, the decontamination process shall consist of HEPA vacuuming, wet wiping/mopping and a repeated HEPA vacuuming of the entire work area. All surfaces in and around the work area must be free of dust generated during the work.

.2 Decontaminate all tools and equipment before removal from the work area.

.3 If dust or debris has migrated to areas of the building other than the immediate work area, those areas shall be incorporated into the work area and thoroughly decontaminated to ensure all visible dust generated by the activity is eliminated.

.4 Uncontaminated dust barriers and other protective sheeting shall be placed in disposable construction bags and disposed of as normal trash.

.5 Visually inspect the area for any remaining dust or debris. HEPA vacuum and wet wipe until space is clean. Dispose of vacuum contents as PCB waste.

.6 Upon completion of decontamination and removing temporary dust barriers, a final inspection shall be performed by the Contractor.

.7 Failure of any visual inspection by the Consultant, the Contractor will clean the affected areas at no additional expense to the Owner.

3.6 Transportation and Reporting

.1 All waste containers shall be fully enclosed and lockable (i.e. enclosed dumpster, trailer, etc.).

.1 While on-site, the container shall be labelled with PCB Warning Labels and as required by Federal and Provincial regulations.

.2 All waste generated as part of the PCB project shall be removed from the site within ten (10) calendar days after successful completion of all PCB abatement work.

.3 The Hauler, with the Abatement Contractor, shall inspect the transport container prior to the Hauler taking possession and signing the Hazardous Waste Manifests.

.4 A Hazardous Waste Manifest shall be utilized solely as the waste Manifest for transportation. A hauler billing form or bill of lading may be used if the hauler needs an independent record but shall not be used as a shipping document.

.1 The Manifest shall be completed by the Contractor and verified by the Consultant that all the information and amounts are accurate, and the proper signatures are in place.

.2 The Manifest shall have the appropriate signatures of the Owner's Representative (the Generator) and the Hauler representative prior to any waste being removed from the site.

.3 Upon arrival at the Disposal Site, the Manifest shall be signed by the Disposal Facility operator to certify receipt of PCB materials covered by the manifest.

.4 The Disposal Facility operator shall return the original Manifest to the Owner's Representative (the Generator).

.5 Provide a copy of the completed waste manifest proving receipt of the PCB waste by the Disposal Facility.

.5 Transport materials following Transportation of Dangerous Goods Act.

.1 Transport PCBs to approved incineration site for destruction and ensure materials are destroyed.

.6 The facility used to process the PCBs shall be approved by the Ministry of the Environment and Parks.

.1 The facility must issue a Certificate of Destruction identifying types and quantities of PCBs generated from the project.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Unless otherwise shown or specified it is the intent that work performed as per this section will result in the identification, removal, preparation for disposal, transportation, and disposal of mercury-containing fluorescent and mercury vapour lamps, HVAC control systems, manometers, switches and thermostats.

1.3 Quality Assurance

.1 Use qualified contractors to isolate mechanical/electrical services prior to the removal of lamps or other mercury-containing equipment.

.2 Ensure the removal and handling of mercury-containing equipment is performed by persons experienced in the relevant methods, procedures and industry practices.

.3 Complete work so that at no time does mercury contaminate the building or environment.

1.4 Instruction and Training

.1 Instruction and training must be provided to all workers and supervisors. Instruction and training include the following:

.1 Hazards of mercury.

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

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

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

.4 The measures and procedures prescribed by this section.

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

1.5 Personal Protection

.1 During removal of equipment containing mercury, personnel are to wear personal protective equipment appropriate to the work being performed.

.2 The following personal protection is to be available on site in the event of a spill or leak:

.1 Non-powered half-face respirators with combined P100 and mercury vapour cartridge.

.2 Protective clothing.

.3 Rubber, nitrile or latex gloves.

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

PART 2 PRODUCTS

2.1 Materials

.1 Containment Drums: new metal pails or steel drums with removable steel lid. Drums shall be newly painted inside and out with bright white rust-resistant enamel.

.2 Drum liners: clear polyethylene bag, 0.15mm thick.

.3 Label: Mercury warning labels.

.4 Lamp Storage Container: Cardboard box that lamps were originally packaged within, or plastic or cardboard totes for recycling lamps. Intent is to package lamps so that they are not broken during shipping. Container to be designed for lamps of that size.

.5 Mercury Sponge: A plated metal-wool pad for the pick-up of mercury spills.

.6 Mercury Vacuum: Nilfisk VT Mercury Vacuum or equal. Vacuum used to collect liquid mercury and granular mercury compounds with an internal HEPA filter and an activated carbon adsorbent filter to purify exhaust air of mercury vapours.

.7 Neutralizing Agent: Mercon X or similar. Mercury neutralizing solution such as 20% calcium polysulfide or sodium thiosulphate.

.8 TSP: Tri Sodium Phosphate, or other strong cleaner.

PART 3 EXECUTION

3.1 Equipment Removal

.1 Prior to removing any fixtures or equipment, ensure associated services are isolated and de-energized.

.2 Locate and remove the following materials designated to be disposed of:

.1 Fluorescent and mercury vapour lamps

.2 HVAC control systems, manometers, switches

.3 Thermostats

.3 Place all mercury-containing equipment into containers to prevent breakage.

.4 Provide an accurate inventory of the contents of each container including number of light tubes and lamps and an estimate of the total weight of the container in kilograms.

3.2 Packaging

.1 Do not contaminate building surfaces with mercury.

.2 Notify Owner's Representative of any spills immediately.

.1 Any spills of mercury are to be cleaned to the satisfaction of the Owner's Representative at the contractor's cost. This includes removal and replacement of building materials as required.

.3 Install polyethylene drop sheets in packaging area to protect surfaces and finishes.

.4 Package lamps in lamp storage containers. Do not break lamps.

.5 Package mercury-containing equipment as follows:

.1 Place polyethylene liner in metal drum or pail.

.2 Carefully place mercury-containing equipment in pails, to prevent breakage.

.3 When full, or all items placed in container, seal liner bag with duct tape, seal lid, and place appropriate label on outside of container.

3.3 Emergency Response for Spills

.1 For small spills:

.1 Evacuate area. Only personnel using the specified personal protective equipment are to be in spill area.

.2 Open windows or provide ventilation to area.

.3 Clean mercury and broken glass with mercury vacuum.

.4 Clean horizontal surfaces impacted by spill with TSP or approved alternative cleaner.

.2 For large mercury spills:

.1 Evacuate area. Only personnel using the specified personal protective equipment are to be in spill area.

.2 Contact Owner's Representative immediately.

.3 Open windows or provide ventilation to area.

.4 Deactivate heat systems if they are adjacent and may aid in vaporization of mercury.

.5 If spill cannot be cleaned up immediately, apply neutralizing agent over mercury spill area.

.6 Collect mercury droplets together will a dustpan, squeegee or mercury vacuum.

.7 Clean-up bulk mercury using aspirator bulb or mercury vacuum. Clean remainder with a mercury sponge. Place mercury in closed container (plastic or glass).

.8 Porous surfaces are to be cleaned with Neutralizing Agent after clean-up of bulk mercury. Neutralizing Agent to be cleaned with mercury vacuum, or manufacturer's instructions.

.9 If mercury spills into soil, carpet, through cracks, into drains etc. further removal of surface materials at contractor's cost will be required. Do not proceed without approval from Owner's Representative.

.10 Clean horizontal surfaces impacted by spill with TSP or approved alternative cleaner.

.11 Place all cleaning materials including drop sheets or polyethylene sheeting in containment drums.

3.4 Transportation and Reporting

.1 Transport materials following Transportation of Dangerous Goods Act.

.1 Transport Mercury Materials and Waste to approved site for recycling, including mercury vapour in lamps, and ensure materials are recycled.

.2 The facility used to process and recycle the mercury shall be approved by the Ministry of the Environment and Parks, and local jurisdictional authority, and shall have valid Certificates of Approval to carry out the work outlined herein.

.1 The facility must issue a Certificate of Recycling identifying types and quantities of materials generated from the project. The facility must also provide a Certificate of Recycling for the mercury generated from the project.

.3 Provide the Abatement Consultant a copy of each waste manifest and or a letter from the recycling agency acknowledging receipt of the materials.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to the hazardous materials reports provided for the extent of the Abatement Work Areas.

.2 Remove and dispose of the following materials as clean waste prior to abatement work:

.1 Carpet, thresholds, tack strips and underpad.

.2 Millwork and cabinets.

.3 Doors and door hardware.

.3 Comply with requirements of this Section when performing the following Work:

.1 Drilling of holes in concrete or rock.

.2 Any operation at a project that requires handling of silica-containing material in a way that may result in a worker being exposed to airborne silica, and not defined in other sections.

.3 Entry into a dry mortar removal or abrasive blasting area while airborne dust is visible for less than 15 minutes for inspection and/or sampling.

.4 Working within 25 metres of an area where compressed air is being used to remove silica-containing dust outdoors.

1.3 Instruction and Training

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

.1 Hazards of silica.

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

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

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

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

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

1.4 Personal Protection

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

.2 Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.

.3 Provide protective clothing for personnel entering the Abatement Work Area, including:

.1 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

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

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 Refer to Section 02 81 00.

PART 3 EXECUTION

3.1 Site Preparation

.1 Stored or non-fixed items, including but not limited to equipment, furniture, waste etc., shall be removed from the Abatement Work Area prior to abatement work.

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

.3 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.

.1 Ensure safe installation of electrical lines and equipment.

.4 Isolate Abatement Work Area with barrier tape located a minimum of 10 metres away from work being performed.

.5 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of a silica dust hazard.

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

.7 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

3.2 Maintenance of Abatement Work Area

.1 Maintain Abatement Work Area in tidy condition.

.2 Remove waste and debris frequently.

.3 Remove standing water on floor at the end of every shift.

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

3.3 Silica Handling

.1 Removal methods minimizing dust generation should be used wherever possible.

.1 Wet methods are to be used to reduce dust generation.

.2 Wetting agents should be used where possible.

.3 Wet methods should not be used if it creates a hazard or cause damage to equipment or to project.

.2 Power tools to be equipped with a shroud, and to be kept flush with surface.

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

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

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

.6 Waste generated should be maintained wet until cleaned.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to the hazardous materials reports provided for the extent of the Abatement Work Areas.

.2 Remove and dispose of the following materials as clean waste prior to abatement work:

.1 Carpet, thresholds, tack strips and underpad.

.2 Millwork and cabinets.

.3 Doors and door hardware.

.3 Comply with requirements of this Section when performing the following Work:

.1 Removal of non-asbestos refractory materials with a jackhammer.

.2 Use of power tool to cut, grind, or polish concrete, masonry, terrazzo and refractory materials.

.3 Use of power tool to remove silica-containing materials.

.4 Tuckpoint and surface grinding.

.5 Dry mortar removal with electric or pneumatic cutting device.

.6 Dry method dust cleaning of abrasive blasting operations.

1.3 Instruction and Training

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

.1 Hazards of silica.

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

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

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

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

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

1.4 Personal Protection

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

.2 Provide the following respiratory protection to all personnel, at minimum:

.1 Non-powered full-face respirators with P100 high efficiency (HEPA) cartridge filters.

.2 Full Face Powered Air Purifying Respirators (PAPR) with P100 high efficiency (HEPA) cartridge filters during

.3 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

.1 Disposable protective clothing that does not readily retain dust or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

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

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 Refer to Section 02 81 00.

2.2 Hoarding Walls

.1 Type A Hoarding Wall: One layer of rip-proof polyethylene sheeting installed floor to ceiling, secured with telescopic poles, clips, or other suitable methods.

.2 Type B Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of rip-proof polyethylene sheeting on each side of wall.

.3 Type C Hoarding Wall: 38 mm x 89 mm wood or metal studs at 400 mm o/c with continuous sill and top plate, covered with one layer of polyethylene sheeting on each side of wall. Install 13 mm OSB, plywood or gypsum board over polyethylene sheeting on Occupied Area side. Paint Occupied Area side of plywood, OSB, or gypsum board with one coat of primer and one coat of flat white latex.

.4 Windows: Install sufficient transparent windows area in hoarding walls to allow observation of entire work area from outside the enclosure where existing solid walls do not make up the perimeter.

2.3 Clean Room

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

.2 Install walls as follows:

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

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

.3 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting on floor.

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

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

walls.

.6 Install a fire extinguisher, mount to wall.

2.4 Curtained Doorways

.1 Construct as follows:

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

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

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

.4 Provide direction arrows on flaps to indicate opening.

PART 3 EXECUTION

3.1 Site Preparation - General

.1 Stored or non-fixed items, including but not limited to equipment, furniture, waste etc., shall be removed from the Abatement Work Area prior to abatement work.

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

.3 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.

.1 Ensure safe installation of electrical lines and equipment.

3.2 Site Preparation –Enclosure

.1 Install Curtained Doorways.

.2 Seal openings in floor using tape, caulking, polyethylene, etc. Floor openings are to be sealed independently prior to installation of floor polyethylene.

.3 Install 6 mil polyethylene sheeting on walls to remain within the Abatement Work Area.

.4 Install one layer of 6 mil polyethylene sheeting so as to protect all equipment and finishes in the Abatement Work Area that may be damaged.

.5 Place required tools to complete the abatement with the Abatement Work Area.

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

.7 Establish negative pressure in Abatement Work Areas as follows:

.1 Provide sufficient HEPA filtered negative pressure machines to exchange a volume of air equivalent to that of the Abatement Work Area a minimum of every 15 minutes.

.2 Provide additional HEPA filtered negative pressure machines as required to ensure air flow from Occupied Area into Abatement Work Area.

.3 Operate HEPA filtered negative pressure machines continuously from first disturbance of ACM until completion of dismantling.

.4 Replace prefilters to maintain specified flow rate.

.5 Replace HEPA filter as required to maintain flow rate and integrity of unit.

.6 Discharge HEPA filtered negative air machines to building exterior, where possible.

.1 Direct discharge away from building access points.

.8 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of a silica dust hazard.

.9 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

3.3 Maintenance of Abatement Work Area

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

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

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

.4 Maintain Abatement Work Area in tidy condition.

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

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

3.4 Silica Handling

.1 Removal methods minimizing dust generation should be used wherever possible.

.1 Wet methods are to be used to reduce dust generation.

.1 Wetting agents should be used where possible.

.2 Wet methods should not be used if it creates a hazard or cause damage to equipment or to project.

.2 Power tools to be equipped with a shroud, and to be kept flush with surface.

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

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

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

.6 Waste generated should be maintained wet until cleaned.

END OF SECTION

END OF ADDENDUM 02