



## Hazardous Materials Abatement Program Specifications

SAP # 3605 -Keele Street Public School –  
Accessibility Project Work Locations  
99 Mountview Avenue  
Toronto, Ontario

### Prepared for:

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## EXECUTIVE SUMMARY

RiskCheck Inc. (RiskCheck) was retained by Toronto District School Board (TDSB, Client) to perform a Pre-Renovation Designated Substances Survey (Pre-Demo DSS) within the Accessibility Project Work Locations in the school building known as SAP # 3605 -Keele Street Public School, located at 99 Mountview Avenue in Toronto, Ontario (subject building).

The Pre-Demo DSS was conducted to meet the requirements of Section 30 in the Ontario Occupational Health and Safety Act (OHSA), Revised Statutes of Ontario (R.S.O.) 1990, (as amended). The HBMA included a visual examination and assessment of the presence and condition of the 11 designated substances regulated under the Ontario OHSA. In addition to the 11 regulated designated substances.

The findings of the Pre-Demo DSS have been presented in separate report entitled:

- ✓ “Designated Substances Survey, SAP # 3605 -Keele Street Public School – Accessibility Project Work Locations, 99 Mountview Avenue, Toronto, Ontario”, prepared for TDSB by RiskCheck and dated April 17, 2026.

RiskCheck was requested by TDSB to provide specifications (based on the findings of the Pre-Demo DSS report) for the proposed renovation activities at the subject building. The controls for demolition removal and disposal of the designated substances and hazardous materials generated prior to the renovation activities in the subject building has been provided for contractor tendering purposes.

The Request for Proposal (RFP) process is to be arranged and scheduled by TDSB.



## TABLE OF CONTENTS

	Page No.
<b>1.0 GENERAL.....</b>	<b>1</b>
1.1 SUMMARY.....	1
1.2 ABATEMENT CONSULTING SERVICES .....	1
1.2.1 Inspections .....	2
1.2.2 Pre-Abatement Visual Inspection.....	2
1.2.3 Post-Abatement Visual Inspection .....	2
1.3 SCHEDULING OF WORK .....	2
1.4 FACILITY PROTECTION.....	3
1.5 INSPECTION .....	3
1.6 GENERAL PERSONNEL HEALTH, SAFETY AND TRAINING.....	3
1.7 QUALITY ASSURANCE .....	4
1.8 SUPERVISION .....	5
1.9 NOTIFICATION.....	6
<b>2.0 ASBESTOS CONTAINING MATERIALS ABATEMENT .....</b>	<b>6</b>
2.1 GENERAL INFORMATION .....	6
2.2 SITE CONDITIONS.....	6
2.3 REGULATIONS, CODES AND GUIDELINES .....	7
2.4 OUTLINE OF ASBESTOS ABATEMENT PROGRAM .....	8
2.5 SUBMITTALS .....	9
2.6 INSTRUCTION AND TRAINING.....	10
2.7 WORKER PROTECTION .....	10
2.8 VISITOR PROTECTION .....	11
2.9 PROJECT WORK AREA SIGNAGE.....	12
2.10 AIR MONITORING – AIRBORNE ASBESTOS MONITORING .....	12
2.11 PRODUCTS, MATERIALS AND EQUIPMENT.....	13
2.12 GENERAL ASBESTOS WASTE AND MATERIAL HANDLING .....	15
2.13 ASBESTOS – TYPE 1 ABATEMENT OPERATIONS .....	16
2.13.1 Summary of Project Work Actions .....	16



2.13.2	Worker Personal Protection.....	16
2.13.3	Inspection Milestones .....	17
2.13.4	Project Work Area Preparation .....	17
2.13.5	Maintenance of the Project Work Area .....	18
2.13.6	Type 1 Asbestos Removal.....	18
2.13.7	Project Work Area Dismantling .....	19
2.13.8	Type 1 Asbestos Waste and Material Handling .....	20
2.14	ASBESTOS – TYPE 2 ABATEMENT OPERATIONS .....	20
2.14.1	Summary of Project Work Actions .....	20
2.14.2	Worker Personal Protection.....	20
2.14.3	Inspection Milestones .....	21
2.14.4	Constructing Hoarding Walls.....	22
2.14.5	Decontamination Enclosures .....	22
2.14.6	Constructing Decontamination Enclosures .....	22
2.14.7	Clean Site – Pre-Contamination Preparation .....	23
2.14.8	Maintenance of Contaminated Project Work Area .....	25
2.14.9	Air Monitoring During Abatement .....	26
2.14.10	Type 2 Asbestos Removal – Wet Asbestos Removal .....	26
2.14.11	Application of Post Removal Sealant .....	27
2.14.12	Air Clearance Monitoring.....	27
2.14.13	Project Work Area Dismantling.....	28
3.0	LEAD CONTAINING MATERIALS ABATEMENT .....	29
3.1	GENERAL INFORMATION .....	29
3.2	SITE CONDITIONS.....	29
3.3	REGULATIONS, CODES AND GUIDELINES .....	30
3.4	CLASSIFICATION OF WORK.....	30
3.5	INSTRUCTION AND TRAINING.....	31
3.6	WORKER PROTECTION .....	31
3.7	VISITOR PROTECTION .....	32
3.8	PROJECT WORK AREA SIGNAGE.....	32
3.9	PRODUCTS, MATERIALS AND EQUIPMENT.....	33



3.10	LEAD WASTE AND MATERIAL HANDLING .....	34
3.11	LEAD – TYPE 1 ABATEMENT OPERATIONS.....	34
3.11.1	Summary of Project Work Actions .....	34
3.11.2	Worker Personal Protection.....	35
3.11.3	Inspection Milestones .....	35
3.11.4	Project Work Area Preparation and Maintenance.....	35
3.11.5	Type 1 Lead Removal .....	36
3.11.6	Project Work Area Dismantling.....	37
3.11.7	Inspection.....	37
3.12	LEAD – TYPE 2A ABATEMENT OPERATIONS.....	37
3.12.1	Summary of Project Work Actions .....	37
3.12.2	Worker Personal Protection.....	38
3.12.3	Inspection Milestones .....	38
3.12.4	Project Work Area Preparation and Maintenance.....	38
3.12.5	Containment Construction.....	39
3.12.6	Type 2a Lead Removal – No Containment Required .....	40
3.12.7	Type 2a Lead Removal – Containment Required .....	41
3.12.8	Inspection.....	42
3.12.9	Project Work Area Dismantling.....	42
<b>4.0</b>	<b>MERCURY CONTAINING MATERIALS ABATEMENT.....</b>	<b>42</b>
4.1	GENERAL INFORMATION .....	42
4.2	SITE CONDITIONS.....	42
4.3	REGULATIONS, CODES AND GUIDELINES .....	43
4.4	INSTRUCTION AND TRAINING.....	43
4.5	WORKER PROTECTION .....	44
4.6	PRODUCTS, MATERIALS AND EQUIPMENT.....	44
4.7	INSPECTION MILESTONES .....	44
4.8	PACKAGING OF MERCURY-CONTAINING FLUORESCENT TUBES AND BULBS .....	44
4.9	PACKAGING OF OTHER MERCURY-CONTAINING ITEMS.....	44
4.10	MERCURY WASTE AND MATERIAL HANDLING AND DISPOSAL .....	44



4.11	APPROPRIATE DOCUMENTATION .....	45
4.12	INSPECTION .....	45
<b>5.0</b>	<b>SILICA ABATEMENT .....</b>	<b>45</b>
5.1	GENERAL INFORMATION .....	45
5.2	SITE CONDITIONS.....	45
5.3	REGULATIONS, CODES AND GUIDELINES .....	46
5.4	CLASSIFICATION OF WORK.....	46
5.5	INSTRUCTION AND TRAINING.....	46
5.6	WORKER PROTECTION .....	46
5.7	INSPECTION MILESTONES .....	47
5.8	CONTAINMENT REQUIREMENTS.....	48
5.8.1	Barriers .....	48
5.8.2	Partial Enclosures .....	48
5.8.3	Full Enclosures.....	48
5.9	SILICA – TYPE 2 ABATEMENT OPERATIONS .....	48
5.10	SILICA WASTE AND MATERIAL HANDLING.....	49
5.11	INSPECTION .....	49



## GLOSSARY OF TERMS

Abatement Contractor	Contractor or sub-contractor performing work of this section.
Amended Water	Water with wetting agent added for the purpose of reducing surface tension to allow thorough wetting of materials.
Asbestos	Any of the fibrous silicates defined in the provincial Occupational Health and Safety Regulations, including: actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.
Asbestos-Containing Materials	Material identified under Site Conditions including any debris, overspray, fallen material and settled dust.
Authorized Visitors	Building Owner, Consultant, or designated representative, and persons representing regulatory agencies.
Competent Worker	A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with the Occupational Health and Safety Act, applicable guidelines and standards and has knowledge of the potential or actual danger to health and safety in the work.
Construction	Includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, land clearing, earth moving, grading, excavating, trenching, digging, boring, drilling, blasting, or concreting, the installation of any machinery or plant, and any work or undertaking in connection with a project but does not include any work or undertaking underground in a mine.
Consultant	Owner's Representative providing inspection and air monitoring services.
Contaminated Waste	Material identified under site conditions, including fallen material, settled dust, other debris and materials or equipment deemed to be contaminated by the Consultant.
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.
Designated Substances	A biological, chemical or physical agent or combination thereof prescribed as a designated substance to which the exposure of a worker is prohibited, regulated, restricted, limited or controlled. The designated substances in Ontario are: acrylonitrile, arsenic, asbestos, benzene coke oven emissions, ethylene oxide, isocyanates, lead, mercury, silica and vinyl chloride.
DOP Test	A testing method used to determine the integrity of the Negative Pressure unit or vacuum using a Dispersed Oil Particulate (DOP) or Poly



	Alpha Olefin (PAO) HEPA filter leak test. This test is to be conducted on site where units are to be installed. Refer to the Environmental Abatement Council of Ontario (EACO) DOP/PAO Testing Guideline 2013 or ANSI/ASME N510-2007.
Encapsulation	The application of a liquid sealant to asbestos-containing materials; the sealant may penetrate and harden the material (penetrants) or cover the surface with a protective coating (bridging sealants). Also called encasement. This is generally not advisable.
Enclosure	Enclosure of ACM means the construction of solid enclosure (walls, ceiling, bulkhead etc.) around ACM, or An Enclosure means the site isolation including hoarding walls, polyethylene sheeting and seals that isolates the Project Work Area.
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.
Friable	Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
Glove Bag Removal	A method of removing friable insulation from a piping system using a prefabricated bag which isolates the section of insulation being removed. This is an asbestos Type 2 Procedure.
HEPA Filter	High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.
HEPA Filtered Negative Pressure Unit	Portable air handling unit which extracts air directly from the Project Work Area and discharges the air to the exterior of the building after passing through a HEPA filter.
Lead	<p>A naturally occurring, highly toxic soft metal that can be found in the earth's crust. Because lead is very pliable, it was a valuable resource for manufacturers and was used for many years in building products such as pipes, rods, paints and containers.</p> <p>If left undisturbed and in good condition, lead-based paint does not pose a health threat to building occupants.</p>
Lead-Containing Paint	Paint containing lead, a heavy metal that was once used to create pigments in paint. Many paints manufactured prior to 1978 had lead as one of the ingredients. Lead based paint can create a health hazard through inhalation of dusts or ingestion of paint chips. This can result in damage to the nervous system, brain and reproductive systems
Lock-down Agent	Lock-down Agent: sealant for the purpose of trapping residual dust. Product must have flame spread and smoke development ratings, both less than 50. Product shall leave no stain when dry.



MECP	Ontario Ministry of the Environment, Conservation and Parks.
Mercury	Mercury is a naturally occurring element that is found in air, water, and soil. It exists in several forms: elemental or metallic mercury, inorganic mercury compounds and organic mercury compounds. Elemental or metallic mercury is a shiny, silver-white metal and is liquid at room temperature. Elemental mercury is used in thermometers, fluorescent bulbs, and certain types of machinery and equipment, including pressure gauges, thermostats, and electrical switches.
MOECC	Ontario Ministry of the Environment and Climate Change.
MOL	Ontario Ministry of Labour.
Milestone Inspection	Inspection of the Project Work Area at a defined point in the abatement operation.
NIOSH APF	National Institute for Occupational Safety and Health Assigned Protection Factor
NOPs	Notice of Project
Negative Pressure	A reduced pressure within the Project Work Area (> 0.02 inches of water column) established by extracting air directly from the Project Work Area and discharging it to exterior of building.
Non-Friable	Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
Phase Contrast Microscopy (PCM)	A method which uses an optical microscope to determine airborne fibres, normally in an occupational setting. Particles are observed for shape and size. Results are presented as a number of fibres per cubic centimetre or millilitre of air (f/cc). The method of analysis in Ontario is based on the US National Institute for Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7400, issue 2, Asbestos and Other Fibres by PCM (August 15, 1994).
Silica	Is a transparent to grey odourless powder or crystal. It occurs widely in nature as sand, quartz, flint and diatomite. It is used in the manufacture of glass, ceramics, abrasives, water treatment products, cosmetics, insecticides, paint and foods as well as in the drying of glassware and as a preservative for plant samples. Crystalline silica is used in the production of concrete, cement, acoustic ceiling tiles and ceramic tiles used in construction. The routes of exposure include inhalation and skin or eye contact. Exposure may cause pneumoconiosis and irritation to the lungs, skin or eyes. Chronic inhalation can lead to silicosis.



Transmission Electron Microscopy (TEM)	A method which uses an electron microscope to determine airborne asbestos fibres. Results are presented in fibres per cubic centimetre of air (f/cc). The method of analysis in Ontario is The U.S. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7402, Issue 2: Asbestos by TEM (Aug 15, 1994).
WSIB	Workplace Safety and Insurance Board



## 1.0 GENERAL

### 1.1 Summary

Review this section in conjunction with all applicable reports, laboratory results, drawings, and all other sections of this specification so as to comply with the requirements of the general conditions of the contract for the school building known as Keele Street Public School located at 99 Mountview Avenue in Toronto, Ontario (subject building).

This specification covers the removal and disposal of:

- Asbestos containing 2'x4' acoustic lay in ceiling tile - small holes and pinholes in circular pattern identified in the 2<sup>nd</sup> Floor Vestibule (Loc# 48777),
- Asbestos containing 12"x12" vinyl floor tile - orange with dark orange, light orange and white flecks in the Basement Stage (Loc# 73832),
- Asbestos containing concrete block sealant (paint compound) in 2<sup>nd</sup> Floor Vestibule (Loc# 48777) and Basement Stage (Loc# 73832),
- Lead containing red paint on concrete wall, yellow paint on concrete wall and blue paint on metal door in the Basement Stage (Loc# 73832),
- Lead containing white paint on concrete wall in the 2<sup>nd</sup> Floor Vestibule (Loc# 48777),
- May include the removal mercury containing fluorescent light tubes, and
- May include the removal of or disturbance of silica containing building materials including concrete, masonry, mortar, drywall, and ceiling tiles.

Furnish all labour, materials, services, insurance and equipment, in accordance with requirements of the applicable Provincial and Federal regulations listed in each section to complete the scope of work.

This specification identifies the location, condition and estimated quantities of hazardous building materials to be removed as part of the Accessibility Project at the subject building.

Work will be subject to periodic inspection and air monitoring (when required) by RiskCheck Inc. (RiskCheck, Consultant). The key contact for this project will be Paul Theriault at RiskCheck who can be reached by telephone at (416) 315-2265, or by email at [ptheriault@riskcheckinc.com](mailto:ptheriault@riskcheckinc.com).

### 1.2 Abatement Consulting Services

RiskCheck has been retained by TDSB as the environmental consultant for this project as mentioned in the previous section. The Abatement Contractor is held responsible to inform and communicate to RiskCheck and TDSB of any and all issues with respect to all suspect/presumed/confirmed hazardous materials on-site and complete all work in accordance with regulatory requirements. RiskCheck is available to the Abatement Contractor in order to provide guidance with respect to this specification.



### **1.2.1 Inspections**

1. Visual/air monitoring inspections will be performed by RiskCheck in various stages of the project. The Abatement Contractor is always to allow unencumbered access to the Project Work Area.
2. The Abatement Contractor shall ensure that asbestos dust is not spread outside of the Project Work Area. Any indication of contamination will result in the project stopping until all seals can be inspected by the Abatement Contractor and defects repaired at a no additional cost to RiskCheck or TDSB.

### **1.2.2 Pre-Abatement Visual Inspection**

1. Inspection will focus on the integrity of the enclosures prior to disturbance of materials. 24 hours notification for the inspection shall be given to the consultant by the contractor.

### **1.2.3 Post-Abatement Visual Inspection**

1. Following the abatement of materials and cleaning of the enclosure, the consultant shall perform a second visual inspection to ensure all materials were removed and that the area is free of visible dust and debris.
2. Following the inspection and after the consultant has deemed the area “visibly clean”, the Abatement Contractor shall precede with the application of slow drying sealant. 24 hours notification for the inspection shall be given to the consultant by the Abatement Contractor (as applicable). Note, if the building will no be entered by anyone else prior to demolition, the requirement for clearance air monitoring is waived.

## **1.3 Scheduling of Work**

1. The Abatement Contractor shall prepare and submit the construction schedule for review by the Client and Consultant prior to the start of work. The schedule shall include milestone inspections and all other critical events relating to the work of this section and the work of others. The work schedule shall incorporate substantial performance dates, turnover dates respecting related work elsewhere and time constraints as outlined by RiskCheck and the Client.
2. The project work must comply with the general contract and the Client’s requirements with regard to working hours, phasing, access restrictions and operational requirements.
3. The work of this specification may be conducted in multiple phases.
4. Milestone Inspections may take place, at the Client’s cost, as outlined in each related specification section.
5. 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.



6. Provide 24 hours written notice to the Consultant of any request for scheduling of milestone inspections.
7. The Abatement Contractor shall allow sufficient time for inspection of the current phase of work by the Consultant following site preparations and set up, and prior to the execution of the work.
8. The Abatement Contractor shall allow sufficient time for inspection of the current phase of work by the Consultant following the removal and final cleaning, and prior to demobilization from the site.

## 1.4 Facility Protection

1. Ensure building security at points of entry to the building including windows and doors demounted to accommodate the installation and exhaust of air movement equipment that may be used through the project work.
2. Ensure building security, prior to leaving the facilities, by reactivating alarm systems and contacting appropriate security agencies.
3. The Abatement Contractor shall be responsible to make good all building systems and finishes damaged through the work of this section.

## 1.5 Inspection

RiskCheck is empowered by TDSB to periodically inspect site conditions and work procedures inside and outside of the Project Work Area(s).

1. The following Milestone Inspections may take place, at the Client's cost, as outlined in each related specification section:
  - ✓ **Milestone Inspection A** – Clean Site Preparation
  - ✓ **Milestone Inspection B** – Bulk Removal Inspection
  - ✓ **Milestone Inspection C** – Visual Clearance
  - ✓ **Milestone Inspection D** – Clearance Sampling
  - ✓ **Milestone Inspection E** – Dismantling Inspection

## 1.6 General Personnel Health, Safety and Training

1. Ensure that all workers entering site are trained in accordance with specified personnel training requirements.
2. Ensure levels of protection for each worker area based on planned activity and location of activity.
3. Supply workers with appropriate personal protective equipment (PPE) and ensure that safety equipment and protective clothing is kept clean and maintained.



4. Develop protective equipment usage procedures and ensure that procedures are strictly followed by workers include the following procedures as minimum:
  - ✓ Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses on site within the Project Work Area;
  - ✓ Ensure footwear is Canadian Safety Association approved safety boots;
  - ✓ Dispose of or decontaminate PPE worn on site at end of each workday;
  - ✓ Decontaminate reusable PPE before reissuing;
  - ✓ Provide site personnel with training in usage and limitations of, and qualitative fit testing for, air purifying respirators in accordance with specified regulations;
  - ✓ Develop, implement, and maintain site respirator program;
  - ✓ Monitor, evaluate, and provide respiratory protection for site personnel;
  - ✓ Ensure levels of protection have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified on site;
  - ✓ Assess ability for site personnel to wear respiratory protection; and
  - ✓ Ensure site personnel have passed respirator fit test prior to entering potentially contaminated Project Work Areas. Ensure facial hair does not interfere with proper respirator fit.
5. Implement heat stress, cold stress monitoring program as applicable and include in the site-specific Health and Safety Plan.
6. Develop personnel hygiene and personnel decontamination procedures. Provide minimum protection as follows:
  - ✓ Suitable containers for storage and disposal of used disposable PPE;
  - ✓ Potable water and suitable sanitation facility; and
  - ✓ Emergency and First-Aid Equipment.
7. Develop a plan and locate and maintain emergency and first-aid equipment including a first-aid kit to accommodate the number of workers, portable emergency eye wash stations, and enough fire extinguishers.

## 1.7 Quality Assurance

1. The removal and handling of contaminated materials shall be performed by persons experienced in the methods, procedures, and industry practices of hazardous material (i.e., asbestos, lead, mercury, etc.) abatement.
2. The Abatement Contractor is responsible to ensure that work proceeds to schedule, meeting all requirements of these specifications. The Abatement Contractor shall complete the work so that at no time shall airborne hazards, waste or hazardous waste-water runoff contaminate areas adjacent to the Project Work Area.
3. The Consultant is empowered by Toronto District School Board (TDSB) to inspect adherence to specified work procedures and materials and to inspect for pre, intermittent and final cleanliness and completion of the abatement activities. Additional labour or materials expended by the Abatement



Contractor to provide satisfactory performance to the level specified shall be at no additional cost to TDSB or the Consultant.

4. The Consultant is empowered by TDSB to order a shutdown of work when a leakage of contaminated materials have occurred or is likely to occur. These conditions include, but are not limited to, failure of negative pressure systems, inadequate wetting, failure of critical barriers or decontamination enclosure systems, water leaks, excessive airborne hazardous fibres in areas adjacent to the Project Work Area or in clean room or holding room areas and the contamination of clean room or holding room areas by hazardous fibres and/or settled dust. Additional labour or materials to rectify these or other unsatisfactory conditions shall be at no cost to TDSB or the Consultant.
5. 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 the Project Work Area(s) at no cost to the TDSB or the Consultant.
6. Inspection and potential air monitoring services performed as a result of the Abatement Contractor's failure to conform to specified procedures or level of cleanliness, as determined by the Consultant at the time of a milestone inspection, may be charged back to the Abatement Contractor at the Consultant's discretion.
7. All work involving electrical, mechanical, carpentry, glazing, etc., shall be performed by licensed persons experienced and qualified for the work required.
8. 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 TDSB or the Consultant.

## 1.8 Supervision

1. Provide on site for each work shift, a Shift Superintendent(s), who has authority regarding all aspects related to manpower, equipment and production, and take full responsibility for the health and safety of all personnel working within contaminated areas.
2. The Abatement Contractor shall always employ at least one supervisory person within the enclosure and one outside the enclosure when enclosures are present.
3. Submit, for all supervisory personnel, Ontario Ministry of Labour, Training and Skills Development approved hazardous material worker training certification and documentation substantiating supervisory function on at least one comparable project in an occupied building.
4. At all times during work, the 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 TDSB or the Consultant.
5. Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the Consultant. The Consultant reserves the right to request replacement of supervisory personnel without explanation.

6. Replacement of supervisory personnel cannot be undertaken without the written approval of the Consultant.

## 1.9 Notification

1. For asbestos related abatement work: No later than 14 days before commencing certain Type 2 and any Type 3 asbestos related abatement work, submit a Notice of Project for Asbestos (NOPA) to the Ontario Ministry of Labour Relations and Workplace Safety OHS Division.
2. Inform all trades on site of the presence and location of hazardous materials identified in the contract documents.
3. Notify the Client or Client's Representative, the Joint Occupational Health and Safety Committee and the Provincial Ministry of Labour (as applicable), if suspected hazardous materials not identified in the contract documents are discovered during the work. Stop work in these areas immediately.
4. Notify the land fill site receiving the hazardous waste per the requirements of regulation 558/00.
5. Notify the Fire Marshall, in cases where the execution of the work will result in blocking building exists or when turning off, removing or temporarily altering fire alarms.

## 2.0 ASBESTOS CONTAINING MATERIALS ABATEMENT

### 2.1 General Information

This section of the specification (*Section 2.0*) covers the removal and disposal of asbestos containing materials. Work will also include the removal of all settled dust, and debris materials.

Furnish all labour, materials, services, insurance and equipment, in accordance with requirements of Ontario Regulation (O. Reg.) 278/05 Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations (as amended), Ontario Ministry of Labour, Ontario Ministry of the Environment, Conservation and Parks and other regulatory agencies (as listed in *Section 2.3 – Regulations, Codes and Guidelines*) to complete the work of this section.

Work will be subject to periodic inspection and air monitoring by RiskCheck (the Consultant).

### 2.2 Site Conditions

The following materials in the project work areas have been **confirmed to contain asbestos**:

- ✓ 2'x4' acoustic lay in ceiling tile - small holes and pinholes in circular pattern identified in the 2<sup>nd</sup> Floor Vestibule (Loc# 48777);
- ✓ 12"x12" vinyl floor tile - orange with dark orange, light orange and white flecks identified in the Basement Stage (Loc# 73832); and





- ✓ Concrete block sealant (paint compound) in 2nd Floor Vestibule (Loc# 48777) and Basement Stage (Loc# 73832).

The following materials in the project work areas have been **confirmed to not contain asbestos**, based on sampling or material composition:

- ✓ 12"x12" beige with light and dark dense irregular reddish brown flecks vinyl floor tiles and associated mastic;
- ✓ Mastic associated with 12"x12" orange with dark orange, light orange and white flecks vinyl floor tiles;
- ✓ Green vinyl sheet flooring and associated mastic;
- ✓ Brown and yellow vinyl baseboard mastic;
- ✓ Brown and white caulking on door frames; and
- ✓ Interior concrete block mortar.

Quantities and site conditions to be confirmed by the Abatement Contractor and any discrepancies are to be reported to the Consultant.

### General Building Conditions

1. Power and water will remain active for the abatement.
2. Hours of access to be confirmed by TDSB.

## 2.3 Regulations, Codes and Guidelines

1. Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.
2. Where regulations are not present, follow accepted industry standards and applicable guideline documents.
3. Regulations and guidelines include but are not limited to the following:
  - ✓ *Ontario Occupational Health and Safety Act, R.S.O. 1990, c. O.1*
  - ✓ *Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation (O. Reg.) 278/05 (as amended by O. Reg. 450/19).*
  - ✓ *Environmental Abatement Council of Canada (EACC) "Technical Guideline to Asbestos Exposure Management Programs", 2018.*
  - ✓ *Ontario Regulation 490/09, Designated Substances.*
  - ✓ *Ontario General – Waste Management, R.R.O. 1990, Reg. 347 (as amended by O. Reg. 777/20)*



- ✓ *Transportation of Dangerous Goods Act, 1992 (Canada).*
- ✓ *CSA Standard Z94.4-M2003, Selection, Care, and Use of Respirators.*

## 2.4 Outline of Asbestos Abatement Program

1. Remove and place any required items to facilitate the work in an area outside of the Project Work Areas for clean waste without disturbing asbestos-containing materials.
2. Using procedures prescribed in the sections identified in related work, remove and dispose of the following:
  - ✓ 2'x4' acoustic lay in ceiling tile - small holes and pinholes in circular pattern identified in the 2<sup>nd</sup> Floor Vestibule (Loc# 48777);
  - ✓ 12"x12" vinyl floor tile - orange with dark orange, light orange and white flecks identified in the Basement Stage (Loc# 73832); and
  - ✓ Concrete block sealant (paint compound) in 2nd Floor Vestibule (Loc# 48777) and Basement Stage (Loc# 73832).
3. Refer to specification sections identified in the related work for specified personnel protective measures for the safe handling, removal and clean-up of ACM in each phase or work area.
4. Visit the site prior to tender close to confirm the location and extent of any ACM.
5. Isolate the Project Work Area from adjoining occupied and non-occupied areas whether present at an interior or exterior location.
6. Maintain emergency and fire exits from the Project 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 routes. Seal emergency exit doors so as not to impede the use of door during emergency evacuation.
7. Encapsulation will not be permitted where removal of building materials or structures scheduled for demolition will facilitate access to the asbestos materials in question.
8. Final clean work area to remove visible signs of asbestos and other hazardous materials, other debris or settled dust.
9. Apply lock-down agent to exposed surfaces throughout the Project Work Area and to surfaces from which any friable ACM have been removed.
10. Unless otherwise specified, the handling, removal, clean-up or repair of ACM or surfaces contaminated with ACM is to be performed following wet removal techniques.



11. Asbestos waste generated from this site is to be properly disposed of at a receiving landfill which is authorized and accepts ACM waste.

## 2.5 Submittals

1. Submit prior to starting work:
  - ✓ A copy of the NOPA;
  - ✓ Work procedures;
  - ✓ Certificate of Insurance; and
  - ✓ Workplace Safety Insurance Board (WSIB) Certificate.
2. Submit the following information regarding personnel prior to starting work:
  - ✓ Proof in the form of a certificate that supervisory personnel have attended a minimum two-day course;
  - ✓ Proof in the form of a certificate of worker training;
  - ✓ WHMIS training certificates for all personnel;
  - ✓ Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed;
  - ✓ 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 prior to isolating the Project Work Area:
  - ✓ Safety Data Sheets for chemicals or material used during the abatement project.
4. Submit the following information regarding HEPA filtered devices prior to construction of enclosure or asbestos abatement:
  - ✓ Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old; and
  - ✓ Performance data on negative air units including DOP tests which must be no more than 3 months old if the unit is vented outdoors or which must be performed on site immediately prior to initial usage and when HEPA filters are changed if the unit is vented indoors
5. DOP tests to be performed by an independent testing company.
  - ✓ 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);



- ✓ 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;
- ✓ DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing; and
- ✓ Proof of calibration of DOP testing equipment.

**6.** Submit the following upon completion of the work.

- ✓ Manifests, waybills, bills of lading etc. as applicable for each type of waste.

## **2.6 Instruction and Training**

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

- ✓ Hazards of asbestos;
- ✓ 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:
  - Limitations of equipment;
  - Inspection and maintenance of equipment;
  - Proper fitting of equipment; and
  - Disinfecting and cleaning of equipment.
- ✓ Personal hygiene to be observed when performing the work; and
- ✓ Measures and procedures prescribed in the regulation and decontamination of the worker.

**2.** Instruction and training must be provided by a competent worker.

## **2.7 Worker Protection**

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



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

## 2.8 Visitor Protection

1. Provide clean protective clothing and equipment to Authorized Visitors.
2. Instruct Authorized Visitors in the use of protective clothing and Project Work Area entry and exit procedures.



3. Authorized Visitors are required to be fit tested on respirators, prior to entering the Project Work Area.

## 2.9 Project Work Area Signage

1. **Asbestos Abatement Signs:** Post signs at access points to the Project Work Area, stating at minimum, the following:
  - ✓ There is an asbestos dust hazard; and
  - ✓ Access to the Project Work Area is restricted to persons wearing protective clothing and equipment.
2. Bins and Waste Containers: Post signs on both sides of every asbestos waste container. Signs must display 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:
  - ✓ Contains Asbestos Fibres;
  - ✓ Avoid Creating Dust and Spillage;
  - ✓ Asbestos May be Harmful to Your Health;
  - ✓ Wear Approved Protective Equipment; and
  - ✓ Place appropriate placards (where required) in accordance with Transportation of Dangerous Goods Act.

## 2.10 Air Monitoring – Airborne Asbestos Monitoring

1. Air monitoring will be performed using Phase Contrast Microscopy (PCM) following the National Institute for Occupational Safety and Health Method 7400.
2. Co-operate in the collection of air samples, including providing workers to wear sample pumps for up to full-shift periods. The Abatement Contractor will be responsible for the cost of testing equipment repairs or resampling resulting from the actions of the Abatement Contractor's forces.
3. Results of PCM samples of 0.05 fibres per cubic centimeter of air (fibre/cc) or greater, outside the Project Work Area, will indicate asbestos contamination of these areas. Respond as follows:
  - ✓ Suspend work within the adjoining Project Work Area until written authorization to resume work has been received from the Consultant;
  - ✓ Isolate and clean area in the same manner applicable to the Project Work Area;
  - ✓ Maintain Project Work Area isolation, and repeat clean-up operations until visual inspection and air monitoring results are at a level equal to that specified; and
  - ✓ At the discretion of the 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.



4. Results of PCM samples at or greater than 0.01 fibres per cubic centimeter of air (fibre/cc), collected within the Project 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:
  - ✓ Maintain Project Work Area isolation and re-clean the entire Project Work Area. Then apply another acceptable coat of lock-down agent to exposed surfaces throughout the Project Work Area; and
  - ✓ Repeat above measures until visually inspected and air monitoring results are at a level equal to that specified.
5. When results exceed 50% of maximum use concentration for the respirator being used within the Project Work Area respond as follows:
  - ✓ Immediately stop work within the Project Work Area.;
  - ✓ Instruct workers to exit the Project Work Area via the Worker Decontamination Facility while observing specified personnel exiting procedures;
  - ✓ Abatement Contractor's forces shall not re-enter the Project Work Area for a period of 8 hours or until authorized by the Consultant; and
  - ✓ Upon re-entry to the Project Work Area, mist the air, any fallen debris or exposed surfaces with amended water using an airless sprayer.
6. Additional labour or materials expended by the Abatement Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to TDSB or the Consultant.
7. Cost of additional inspection and sampling performed as a result of elevated asbestos fibre concentrations in areas outside the Project Work Area following completion of work, will be the responsibility of the Abatement Contractor.

## 2.11 Products, Materials and Equipment

Deliver all materials and disposable equipment in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name. The Abatement Contractor is to provide own equipment including all PPE, equipment for containment negative air and dust control, as well as additional equipment required for all scope of work activities to be completed. Material that becomes contaminated with asbestos shall be disposed of in accordance with the applicable regulations.

1. **Adhesive tape:** Suitable for sealing polyethylene to surfaces encountered and to itself under both wet and dry conditions including use of amended water.



2. **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.
3. **Amended Water:** Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of materials.
4. **Asbestos Waste Container:** A container acceptable to disposal site, and the provincial regulator comprised of the following:
  - ✓ Dust tight;
  - ✓ Suitable for the type of waste;
  - ✓ Impervious to asbestos; and
  - ✓ Identified as asbestos waste.
5. **HEPA Vacuum:** Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.
6. **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.
7. **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.
8. **Protective Clothing:** Disposable coveralls complete with head covering and full body covering that fits snugly at the ankles, wrists and neck, manufactured by Dupont Tyvek, Kimberley Clarke or other approved equivalent manufacturer.
9. **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.
10. **Sprayer:** Garden type portable manual sprayer or water hose with spray attachment if suitable.
11. **Tape:** Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.
12. **Warning labels and signs:** delineating entry and protective equipment requirements and providing warning of the potential health effects of exposure to airborne asbestos fibre.
13. **Wetting Agent:** Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.





## 2.12 General Asbestos Waste and Material Handling

1. Waste bins must be placed on grade or in receiving.
2. All bins for ACM and ACM-contaminated waste must be covered and locked when waste transfer is not being performed.
3. Ensure redundant non-ACM, rubble, debris, etc. is not included in the waste bin.
4. Clean, wash and apply Post Removal Sealant to metal waste prior to removal from the Project Work Area.
5. Clean, wash and apply Post Removal Sealant to non-porous materials prior to disposal as clean waste. Obtain prior written approval from the Consultant for each individual type of material.
6. Clean and wash equipment prior to removal from the Project 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 Project Work Area to waste bin.
9. Removal of waste containers and decontaminated tools and materials from the Project Work Area shall be performed according to Type 1, Type 2 or Type 3 asbestos abatement procedures as per the scope of work.
10. Transport waste and materials via the predetermined routes and exits. Use a closed, covered cart to transport through Occupied Areas.
11. Use Type 1 procedures while transporting asbestos waste through the subject building.
12. Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled material in the case of a rupture of a Waste Container.
13. Bin loading area and waste routes shall be kept clean at all times.
14. Transport hazardous waste to landfill or waste transfer station in accordance with provincial requirements.
15. Cooperate with the provincial Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Consultant or TDSB.



## 2.13 Asbestos – Type 1 Abatement Operations

### 2.13.1 Summary of Project Work Actions

1. Isolate the Project Work Area from adjoining spaces through the installation of temporary barriers and partitions as specified herein.
2. Using Type 1 asbestos abatement operations, remove and dispose of the following:
  - ✓ 2'x4' acoustic lay in ceiling tile - small holes and pinholes in circular pattern identified in the 2<sup>nd</sup> Floor Vestibule (Loc# 48777);
  - ✓ 12"x12" vinyl floor tile - orange with dark orange, light orange and white flecks identified in the Basement Stage (Loc# 73832); and
  - ✓ Concrete block sealant (paint compound, and where the block wall is manually demolished and blocks disposed of as asbestos waste) in 2nd Floor Vestibule (Loc# 48777) and Basement Stage (Loc# 73832).
3. The intent of this section is to provide safe work practices and procedures to govern the handling, removal, clean-up, and disposal of ACM following Type 1 procedures, including any of the Consultant's and Client's specific requirements.

### 2.13.2 Worker Personal Protection

In addition to the guidelines outlined in *Section 1.6 – General Personnel Health, Safety and Training* and *Section 2.7 - Worker Protection, the Abatement Contractor* should comply by the following:

1. Always protect all personnel when possibility of disturbance of ACM exists.
2. Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters when requested by personnel.
3. Provide protective clothing to all personnel entering the Project Work Area.
4. Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.
5. Before leaving the Project Work Area, decontamination of respirator, protective clothing, hands and face shall be performed by every worker:
  - ✓ Decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing.
  - OR**
  - ✓ If the protective clothing will not be reused, place it in a container as described in *Section 2.12 – General Asbestos Waste and Material Handling*.



### 2.13.3 Inspection Milestones

1. The following Milestone Inspections are recommended to be scheduled:

#### Milestone Inspection A - Clean Site Preparation

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

#### Milestone Inspection B - Bulk Removal Inspection

- ✓ Inspection during ACM removal, monitoring removal methods, site deficiencies, performing occupied air monitoring, etc.

#### Milestone Inspection C - Visual Clearance

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

### 2.13.4 Project Work Area Preparation

1. Remove and place any required items to facilitate the work in an area outside of the Project Work Area for clean waste without disturbing the ACM.
2. Remove visible dust and friable material from all surfaces in the Project Work Area including those to be worked on, using HEPA Vacuums or wet wiping.
3. Install polyethylene drop sheets below areas of work.
4. Shut down HVAC systems serving the Project Work Area.
  - ✓ Install polyethylene sheeting over openings in ducts and diffusers and seal.
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. Ensure that all holes or openings in existing wall, ceiling and floor structures are adequately sealed.
8. Install signage in clearly visible locations in the Project Work Area, on waste containers, vehicles and bins in sufficient numbers to adequately warn of an asbestos dust hazard as per the guidelines in *Section 2.9 – Project Work Area Signage*.



9. Schedule and obtain written approval of **Milestone Inspection A** - Clean Site Preparation before proceeding.

#### **2.13.5 Maintenance of the Project Work Area**

1. Inspect polyethylene sheeting and ensure it is effectively sealed and taped.
2. Repair damage and remedy defects immediately.
3. Maintain Project Work Area in orderly 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 Project Work Area at end of shift.

#### **2.13.6 Type 1 Asbestos Removal**

1. Workers shall follow and enforce the worker protection standards as listed in *Section 1.5 – General Personnel Health, Safety and Training*, *Section 2.7 - Worker Protection* and *Section 2.13.2 – Worker Personal Protection*.
2. A wetting agent shall be added to the water that is used to control the spread of dust and fibres.
3. Remove non-friable materials without breaking, cutting, drilling, abrading, grinding, sanding or vibrating. Removal work is to be done only by means of non-powered hand-held tools.
4. Place material immediately, without breaking into smaller pieces, into an asbestos waste receptor.
5. Clean surrounding surfaces and Project Work Area frequently with HEPA vacuum or using wet methods.
6. Specific asbestos abatement methods are listed below:

##### **Vinyl Floor Tiles**

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 an 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.



### Acoustic Lay-in Ceiling Tiles (Up To 10 Tiles)

1. Place tile, without breaking into smaller pieces, into an Asbestos Waste Container.
2. Break material only if unavoidable, and wet material if broken during work.
3. HEPA vacuum ceiling tile tracks and other adjacent horizontal surfaces following completion of work in area.

### Concrete Block Wall Sealant (Stripping the Sealant if Required)

1. Wet all material to be disturbed.
2. Use only non-powered hand-held tools to remove sealants.
3. Scrape to remove material adhered to substrate.
4. Where required, remove substrate contaminated with sealants.
5. Apply Bean-E-Doo or other mastic remover as required to remove residual sealants.
6. If mastic removers will generate any significant odour, operational building HVAC must be protected from drawing odours into the building.
7. Residual mastic remover to be neutralized per manufactures instructions.
8. Place removed ACM directly into an asbestos waste container. Seal with duct tape when full.
9. Place into a second bag and seal with duct tape or place into rigid waste container.
10. As filled waste containers accumulate, transfer to area lined and covered waste bin.
11. Remove contaminated material, including protective coveralls, polyethylene, etc. and package as per the above.

### Concrete Block Wall Sealant (Removing Concrete Block)

1. Use only non-powered hand-held tools to demolish the concrete block wall.
2. Remove the concrete blocks one at a time, intact where possible.
3. Place removed blocks with ACM sealant directly into a lined asbestos waste container. Seal with duct tape when full.
4. As filled waste containers accumulate, transfer to area lined and covered waste bin.
5. Remove contaminated material, including protective coveralls, polyethylene, etc. and package as per the above.

#### 2.13.7 Project Work Area Dismantling

1. Schedule and obtain written approval of **Milestone Inspection C** – Visual Clearance.
2. Wash or HEPA vacuum equipment and tools used in the contaminated Project Work Area to remove all asbestos contamination, or place in asbestos waste containers prior to being removed from the Project Work Area.
3. Place tools and equipment used in contaminated Project Work Area but not cleaned in polyethylene bags prior to removal from the Project Work Area.
4. Clean drop sheets with HEPA vacuum or wet cleaning methods at completion of work.



5. Carefully roll drop sheets toward the centre. As drop sheets are rolled away, immediately remove visible debris beneath with a HEPA vacuum.
6. Place drop sheets, tape, disposal clothing and other contaminated waste in asbestos waste containers, wet wipe and place in second asbestos waste container.

#### **2.13.8 Type 1 Asbestos Waste and Material Handling**

1. In addition to the waste handling procedures listed in *Section 2.12 – General Asbestos Waste and Material Handling*, the following Type 1 removal applications must be followed:
  - ✓ Remove any visible contamination from the surface of non-porous or cleanable waste being removed from the Project Work Area. If the item can be cleaned, remove it from the site as clean waste;
  - ✓ Place waste or item in waste container and seal closed;
  - ✓ Wet wipe outside of waste container;
  - ✓ Within decontamination facility, transfer room or at the perimeter of the Project Work Area, place in second waste container and seal closed; and
  - ✓ Remove waste containers and transport to appropriate bin.

### **2.14 Asbestos – Type 2 Abatement Operations**

#### **2.14.1 Summary of Project Work Actions**

1. Install hoarding walls between Project Work Area boundaries as follows:
  - ✓ Install Type A hoarding walls between the Project Work Area and unoccupied area; and
  - ✓ Remove and place any required items to facilitate the work in an area outside of the Project Work Area for clean waste without disturbing the ACM.

#### **2.14.2 Worker Personal Protection**

In addition to the guidelines outlined in *Section 1.6 – General Personnel Health, Safety and Training* and *Section 2.7 - Worker Protection*, the Abatement Contractor should comply by the following:

1. Always protect all personnel when possibility of disturbance of ACM exists.
2. Provide the following respiratory protection to all personnel:
  - ✓ Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
3. The respirator must be fitted so that there is an effective seal between the worker's face and the respirator.



4. Provide protective clothing that consist of head, full body and footwear covering that fit snugly at the ankles, wrists and neck, to all personnel entering the Project Work Area.
5. Once coveralls are worn in work area, they shall be treated as asbestos contaminated waste and disposed of accordingly.
6. Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.
7. Before leaving the Project Work Area, decontamination of respirator, protective clothing, hands and face shall be performed by every worker within a decontamination facility, and protective clothing must be placed in a container as described in *Section 2.12 – General Asbestos Waste and Material Handling*.

### 2.14.3 Inspection Milestones

1. The following Milestone Inspections may take place, at the Client's cost, as outlined in each related specification section:

#### Milestone Inspection A - Clean Site Preparation

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

#### Milestone Inspection B - Bulk Removal Inspection

- ✓ Inspection during ACM removal, monitoring removal methods, site deficiencies, performing occupied air monitoring, etc.

#### Milestone Inspection C - Visual Clearance

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

#### Milestone Inspection D - Clearance Sampling

- ✓ Air monitoring performed following removal of ACM and application of slow drying post abatement adhesive sealant to ensure airborne asbestos fibres concentration levels inside the enclosure(s) are within the acceptable limits prior to the removal of polyethylene.

#### Milestone Inspection E – Dismantling Inspection

- ✓ Inspection after removal of Polyethylene prior to dismantling perimeter seal and decontamination facility.

#### 2.14.4 Constructing 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.

#### 2.14.5 Decontamination Enclosures

1. **Workers' Decontamination and Transfer Facility:** A decontamination facility comprised of two linked rooms, contaminated change room, and a clean change room.
  - ✓ Rooms, occupied areas and the Project Work Areas, shall be separated by curtained doorways at each door.
2. **Contaminated Change Room:** Room between clean change room and the Project Work Area.
  - ✓ Locate adjacent to Project Work Area;
  - ✓ Install asbestos waste container for asbestos contaminated protective clothing;
  - ✓ Install storage facilities for any personal protective equipment to be reused in the Project Work Area including boots, hard hats, etc., but excluding respirators;
  - ✓ Install hooks and shelves as required for personal protective equipment; and
  - ✓ Minimum size of generally 2 m x 2 m. Increase size accordingly to accommodate number of workers.
3. **Clean Change Room:** A room between the contaminated change room and occupied areas.
  - ✓ Install hooks and shelves in clean change room for storage of respirators;
  - ✓ Install lockers or hangers for workers' street clothes and personal belongings;
  - ✓ Install a fire extinguisher, mount to wall; and
  - ✓ Minimum size of generally 2m x 2m. Increase size accordingly to accommodate number of workers.

#### 2.14.6 Constructing Decontamination Enclosures

1. Install floor protection as follows:
  - ✓ Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting beneath entire decontamination enclosure; and
  - ✓ Turn 600 mm of polyethylene up the sides of the decontamination enclosure and overlap with the polyethylene sheeting covering the walls.
2. Install walls as follows:
  - ✓ Around all rooms, between all rooms, at the entrance to the Project Work Area and at the entrance to occupied areas;
  - ✓ Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates;





- ✓ Install one layer rip-proof polyethylene sheeting on interior walls of decontamination enclosure; and
- ✓ Install one layer rip-proof polyethylene sheeting both sides on interior dividing walls of decontamination enclosure.

**3. Install ceilings as follows:**

- ✓ Install joists. The size of the 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;
- ✓ At the contaminated change room and where the ceiling is exposed to the Project 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;
- ✓ Where the ceiling is not exposed to the Project Work Area, install one layer rip-proof polyethylene sheeting over joists;
- ✓ Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls;
- ✓ At the underside of joists in all rooms, install one layer of polyethylene sheeting; and
- ✓ Minimum interior clear height 2000 mm to underside of joist.

**4. Install curtained doorways as follows:**

- ✓ Install two flap doors, full width and height of the door opening at all doors between chambers, enclosures and the Project Work Area;
- ✓ 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;
- ✓ Install weights attached to bottom edge of each door flap; and
- ✓ Provide direction arrows on flaps to indicate opening.

**2.14.7 Clean Site – Pre-Contamination Preparation**

1. Remove and place any required items to facilitate the work in an area outside of the Project Work Areas for clean waste without disturbing ACM.
2. Remove visible dust and friable material from all surfaces (including but not limited to ceiling suspension systems, mechanical ducting and vents, piping, electrical conduit and wiring and all horizontal and vertical surfaces) in the Project Work Area including those to be worked on, using HEPA Vacuums or wet wiping.
3. Remove surface mounted fixtures required to facilitate work.
4. Install hoarding walls between the Project Work Area and occupied area.
5. Install worker decontamination enclosure.
  - ✓ Worker decontamination enclosure to be located within the Project Work Area;
  - ✓ Waste decontamination enclosure to be located within the Project Work Area; and



- ✓ Ensure that the plastic linings provide a continuous barrier and that a seal is maintained around penetrating objects, tears and elsewhere.
- 6. Visually inspect enclosures regularly and at the beginning of each working period. Repair damaged barriers and remedy defects immediately upon discovery.
- 7. For areas with multiple ACM materials in one large location, construct a large containment utilizing rip-proof polyethylene sheeting (including flooring, walls and ceiling (as required)) where practical/reasonable, using methods described in *Section 2.14.6 – Constructing Decontamination Enclosures*.
- 8. Seal openings in floor using tape, caulking, polyethylene, etc. Openings in floor are to be sealed independently prior to installation of polyethylene sheeting on floor.
  - ✓ Large openings in the floor are to be covered. Construction to comply with loading requirements of Provincial Building Code and secured in place. Surround with guard rails as per the Occupational Health and Safety Act. Install one layer of rip proof polyethylene over two layers of 6 mil polyethylene over cover. Mark as opening to below. No personnel are to walk or stand on covered opening unless constructed to support live and dead load.
- 9. Seal openings in walls below ceiling level using polyethylene, tape, caulking, etc. including but not limited to windows, doors, vents, diffusers, etc.
- 10. Seal openings in ceiling, using polyethylene, tape, caulking, etc. including diffusers, grills, etc.
- 11. Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting, on floor surfaces in the Project Work Area.
  - ✓ Install additional layers of rip-proof polyethylene and/or plywood to protect carpeted floor surfaces; and
  - ✓ Extend floor protection a minimum of 300 mm up all vertical surfaces in the Project Work Area.
- 12. On walls within and forming the perimeter of the Project Work Area install two layers of 6 mil polyethylene sheeting.
  - ✓ At junction of floor and wall surface 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.
- 13. Ensure that the plastic linings provide a continuous barrier and that a seal is maintained around penetrating objects, tears and elsewhere.
- 14. Establish negative pressure in Project Work Areas.
  - ✓ Discharge HEPA filtered negative pressure machines as follows:
    - To the building exterior;



- Use polyethylene discharge ducting or metal reinforced polyethylene discharge ducting in locations where the ducting must be protected from damage or collapse;
  - Install and make airtight all negative air discharge ducting;
  - Discharge ducting is not to be longer than required, and to be straight, so that the length of the ducting does not reduce the flow from negative pressure machines; and
  - Install in-line booster fans along the length of discharge ducting wherever site conditions require negative air unit discharge to be directed over distances greater than 12 m (40 ft.). Position booster fans so as to avoid any disruption to operations in occupied areas.
15. All electrical apparatus including vacuums shall be supplied from a ground fault system. Ensure safe installation of temporary electrical extension cables.
16. Shut down HVAC systems serving the Project Work Area.
17. Perform clean demolition of non-ACM required to facilitate work.
18. Install signage in clearly visible locations in the Project Work Area, on waste containers, vehicles and bins in sufficient numbers to adequately warn of an asbestos dust hazard as per the guidelines in *Section 2.10 – Project Work Area Signage*.
19. Post a Ministry of Labour Notice of Project in an accessible area.
20. Notify the Consultant of **Milestone Inspection A** - Clean Site Preparation. Obtain written approval for this Milestone Inspection before proceeding with bulk removal procedures.

#### **2.14.8 Maintenance of Contaminated Project Work Area**

1. Inspect the Project Work Area perimeter hoarding walls and upper perimeter seals at the beginning and end of each working period and once on each day work does not take place. The inspection must be performed by competent worker.
2. Inspect HEPA filtered negative pressure machines including discharge ducting at the beginning and end of each working period. The inspection must be performed by competent worker.
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. Maintain the Project Work Area in orderly condition.
6. Remove waste and debris frequently.
7. Remove standing water on polyethylene/floor at the end of every shift.



#### 2.14.9 Air Monitoring During Abatement

1. Air monitoring may be performed by RiskCheck in accordance with NIOSH 7400. Air samples may be obtained as required from outside and/or inside of the Project Work Area/ enclosure(s).
2. Airborne fibre levels found, in excess of “investigative criteria”, in areas adjacent to the Project Work Area or in clean room or holding room areas, shall initiate an investigation by the Abatement Contractor and RiskCheck into the source of excess airborne fibre levels.
3. Where airborne fibre levels in the Project Work Area exceed the Action Level or Maximum Use Concentration for the respiratory protective equipment observed in use, RiskCheck shall take measures outlined in *Section 1.7 – Quality Assurance*.

#### 2.14.10 Type 2 Asbestos Removal – Wet Asbestos Removal

1. Notify the Consultant of **Milestone Inspection B** – Bulk Removal Inspection when the abatement project is underway.
2. Workers shall follow and enforce the worker protection standards as listed in *Section 1.5 – General Personnel Health, Safety and Training*, *Section 2.7 - Worker Protection* and *Section 2.14.2 – Worker Personal Protection*.
3. A wetting agent shall be added to the water that is used to control the spread of dust and fibres.
4. Do not use compressed air to clean or remove dust or debris.
5. Remove and dispose of remaining non-asbestos items before, during or after wet removal.
6. Remove obstructions as required to remove the ACM.
  - ✓ Notify the Consultant if an item is not specified to be removed and inhibits removal of ACM; and
  - ✓ Do not demolish any existing walls etc. that form the perimeter of the Project Work Area without prior written permission from Consultant.
7. All dislodged ACM shall be maintained in wet state until placed in asbestos waste containers for disposal.
8. As work progresses, and at regular intervals, place waste in asbestos waste containers and remove from the Project Work Area.
9. Use specific abatement methods listed below:

##### Concrete Block Wall Sealant (Removing Concrete Block)

1. Type 2 precautions required If using power tools to demolish the concrete block wall.



2. Place removed blocks with ACM sealant directly into a lined asbestos waste container. Seal with duct tape when full.
  3. As filled waste containers accumulate, transfer to area lined and covered waste bin.
  4. Remove contaminated material, including protective coveralls, polyethylene, etc. and package as per the above.
10. After completion of gross asbestos removal work, perform the following:
- ✓ 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;
  - ✓ Wet clean surfaces which ACM has fallen on using stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue and ACM;
  - ✓ Wet clean other surfaces in the Project 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;
  - ✓ Remove wash water as contaminated waste;
  - ✓ Remove waste;
  - ✓ Level of cleanliness must be acceptable to the Consultant; and
  - ✓ Remove and dispose of the pre-filters from all negative air units as asbestos-contaminated waste.
11. HEPA vacuum and wet wipe all horizontal and vertical finishes within the Project Work Area to remove dust, and fine debris that may be present following the bulk removal.
12. All HEPA filtered negative air pressure systems, air filtration, and decontamination enclosure systems shall remain in service at this time.
13. Notify the Consultant of **Milestone Inspection C** – Visual Clearance Inspection when the abatement project has been completed and is ready for air clearance monitoring.

#### **2.14.11 Application of Post Removal Sealant**

1. Wet removal:
  - ✓ Obtain Consultant's written permission to proceed;
  - ✓ 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 Project Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition; and
  - ✓ Do not apply post removal sealant to materials that will be damaged by its application.
2. Notify the Consultant to the need for **Milestone Inspection D** – Clearance Sampling.

#### **2.14.12 Air Clearance Monitoring**

1. The Project Work Area must be dry prior to air clearance monitoring.
2. The number of air clearance monitoring samples will be as follows:



3. One sample for every 250 square metres of enclosure volume, minimum of one.
4. Restrict access to the Project Work Area and operate negative air units for a 12-hour period prior to **Milestone Inspection D** – Clearance Sampling.
5. The HEPA filtered negative pressure machines shall be in operation during clearance air monitoring.
6. PCM samples will be collected as per the requirements noted in O. Reg. 278/05 (as amended).
7. Airborne fibre levels found, in excess of the "shut down criteria", in areas adjacent to the Project Work Area or in clean room or holding room areas, shall indicate asbestos contamination of these areas. Such areas shall be isolated and cleaned in a manner similar to the Project Work Area, at no additional cost to the Client or the Consultant. Such areas shall be considered to be contaminated until acceptable airborne fibre levels are established in the area.

#### **2.14.13 Project Work Area Dismantling**

1. Continue to restrict access by other trades, unauthorized personnel, etc., to the Project Work Area, until approval of **Milestone Inspection E** – Dismantling Inspection is obtained.
2. Maintain hoardings, decontamination facilities and negative air unit(s) fully functional during teardown and removal of asbestos contaminated polyethylene, tape, etc.
3. Depending on the project specific details, use Type 2 precautions during dismantling.
4. Operate negative air units during dismantling.
5. Phase the removal of polyethylene, tape, polyurethane foam, caulking and enclosures from the Project Work Area so as to maintain perimeter isolation as long as possible.
6. Polyethylene, tape, cleaning material, etc. to be treated as asbestos waste.
7. Wash remaining equipment and tools used in contaminated Project Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from the Project Work Area.
8. Clean the Project Work Area, equipment and access area, washing/showering room.
9. Remove top layer of polyethylene on walls, finishes, and equipment.
10. Remove remaining polyethylene sheeting.
11. Remove water hoses and shut off at source.
12. Remove signs, hoarding walls, decontamination facilities, equipment enclosures, tunnels, platforms.



13. Seal vacuum hoses and fittings, flexible ductwork and all tools used in contaminated work site in 6 mil polyethylene bags prior to removal from the Project Work Area.
14. Remove temporary lights.
15. Remove negative air unit prefilters. Dispose of as asbestos contaminated waste.
16. Remove HEPA filtered negative pressure machines and discharge ducting.
17. Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.
18. Notify the Consultant of **Milestone Inspection E – Dismantling Inspection** when all containments have been dismantled and the Project Work Area is ready for clearance.

## 3.0 LEAD CONTAINING MATERIALS ABATEMENT

### 3.1 General Information

This section of the specification (Section 3.0) covers the identification, removal, transportation, and permanent disposal or recycling of lead products.

Furnish all labour, materials, services, insurance and equipment, in accordance with requirements of Ministry of Labour (MOL) Guideline – Lead on Construction Projects, April 2011 (MOL Lead Guideline) and other regulatory agencies (as listed in *Section 3.3 – Regulations, Codes and Guidelines*) to complete the work of this section.

Work will be subject to periodic inspection and air monitoring by RiskCheck (the Consultant).

### 3.2 Site Conditions

The following lead containing paint/materials have been **confirmed to be present in the Project Work Areas**:

- ✓ Red paint on concrete block wall in Basement Stage (Loc# 73832).
- ✓ Yellow paint on concrete block wall in Basement Stage (Loc# 73832).
- ✓ Blue/Orange paint on metal door in Basement Stage (Loc# 73832).
- ✓ White paint on concrete block wall in 2<sup>nd</sup> Floor Entrance Vestibule (Loc# 48777).

Quantities and site conditions to be confirmed by the Abatement Contractor and any discrepancies are to be reported to the Consultant.

#### General Building Conditions

1. Power and water will remain active for the abatement.



2. Hours of access to be confirmed by TDSB.

### 3.3 Regulations, Codes and Guidelines

1. Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.
2. Where regulations are not present, follow accepted industry standards and applicable guideline documents.
3. Regulations and guidelines include but are not limited to the following:
  - ✓ *Ministry of Labour (MOL) Guideline – Lead on Construction Projects, April 2011 (MOL Lead Guideline).*
  - ✓ *Environmental Abatement Council of Canada (EACC) “EACC Lead Guideline for Construction, Renovation, Maintenance or Repair”, October 2014.*
  - ✓ *Environmental Protection Act, 1999 (Canada).*
  - ✓ *Transportation of Dangerous Goods Act, 1992 (Canada).*
  - ✓ *Ontario Regulation (O. Reg.) 347: General – Waste Management.*
  - ✓ Other legislation and regulations which apply to the performance of the work of this section.

### 3.4 Classification of Work

1. **Type 1** lead operations will be implemented if abatement consists of the following:
  - ✓ Removal of paint coatings containing lead is done using a power tool that has an effective dust collection system equipped with a HEPA filter; and
  - ✓ Removal of paint coatings containing lead using non-powered hand tools, other than manual scraping or sanding.
2. **Type 2a** lead operation will be implemented if abatement consists of the following:
  - ✓ Removal of paint coatings containing lead by scraping or sanding using non-powered hand tools; and
  - ✓ Manual demolition of paint coatings containing lead by striking a wall with a sledgehammer or similar tool.





### 3.5 Instruction and Training

1. Provide instruction and training to all workers including the following:
  - ✓ Hazards of lead;
  - ✓ 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:
    - Limitations of equipment;
    - Inspection and maintenance of equipment;
    - Proper fitting of equipment; and
    - Disinfecting and cleaning of equipment.
  - ✓ Personal hygiene to be observed when performing the work; and
  - ✓ Measures and procedures prescribed in the regulation and decontamination of the worker.
2. Instruction and training must be provided by a competent worker.

### 3.6 Worker Protection

1. Instruct workers before allowing entry to the Project Work Area. Instruction shall include training in use of respirators, dress, showering, entry and exiting from the Project Work Area, and all other aspects of work procedures and protective measures.
2. Workers shall not eat, drink, chew gum or tobacco, or smoke in the Project Work Area.
3. Workers shall be fully protected at all times when possibility of disturbance of hazardous materials exists.
4. Lead-specific soaps and hygiene indicators are to be provided for shower and hand-wash stations which shall be used by all personnel when leaving the Project Work Area.
5. Respiratory Protection:
  - ✓ Refer to each section of the specification for specified type of respiratory equipment specific to each phase or Project Work Area;
  - ✓ Respirators shall be:
    - Certified by the National Institute of Occupational Safety and Health (NIOSH) or another testing agency acceptable to the Provincial regulator;
    - Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter the Project Work Area has facial hair which affects the seal between respirator and face;
    - Assigned to a worker for their exclusive use;
    - Maintained in accordance with manufacturer's specifications;
    - Cleaned, disinfected, and inspected by a competent worker after use on each shift, or more often if required;
    - Repaired or have damaged or deteriorated parts replaced;
    - Stored in a clean and sanitary location;



- Provided with new filters as necessary, according to manufacturer's instructions;
- Worn by personnel who have been fit checked by qualitative or quantitative fit-testing; and
- Instruction on proper use of respirators must be provided by a competent worker as defined by the Occupational Health and Safety Act.

6. Provide protective clothing, to all personnel which:

- ✓ Is made of a material that does not readily retain nor permit penetration of lead dust;
- ✓ Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck;
- ✓ Dust impermeable gloves appropriate for the work being completed;
- ✓ Once coveralls are worn, treat and dispose of as contaminated waste; and
- ✓ Is replaced or repaired if torn or ripped.

7. Use hard hats, safety footwear and other protective equipment and apparel required by applicable construction safety regulations.

### 3.7 Visitor Protection

1. Provide clean protective clothing and equipment to Authorized Visitors.
2. Instruct Authorized Visitors in the use of protective clothing and Project Work Area entry and exit procedures.
3. Authorized visitors are required to be fit tested on respirators, prior to entering the Project Work Area.

### 3.8 Project Work Area Signage

1. **Lead Abatement Signs:** Post signs at access points to the Project Work Area, stating at minimum, the following:
  - ✓ There is a lead dust hazard; and
  - ✓ Access to the Project Work Area is restricted to persons wearing protective clothing and equipment.
2. **Bins and Waste Containers:** Post signs on both sides of every lead 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:
  - ✓ Contains Lead Dust;
  - ✓ Avoid Creating Dust and Spillage;
  - ✓ Lead May be Harmful to Your Health;
  - ✓ Wear Approved Protective Equipment; and
  - ✓ Place appropriate placards (where required) in accordance with Transportation of Dangerous Goods Act.

### 3.9 Products, Materials and Equipment

Deliver all materials and disposable equipment in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name. The Abatement Contractor is to provide own equipment including all PPE, equipment for containment negative air and dust control, as well as additional equipment required for all scope of work activities to be completed. Material that becomes contaminated with lead shall be cleaned or disposed of in accordance with the applicable regulations.

1. **Adhesive tape:** Suitable for sealing polyethylene to surfaces encountered and to itself under both wet and dry conditions including use of amended water.
2. **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.
3. **Amended Water:** Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of materials.
4. **Lead Waste Container:** A container acceptable to disposal site, and the provincial regulator comprised of the following:
  - ✓ Dust tight;
  - ✓ Suitable for the type of waste;
  - ✓ Impervious to lead; and
  - ✓ Identified as lead waste.
5. **HEPA Vacuum:** Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.
6. **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.
7. **Protective Clothing:** Disposable coveralls complete with head covering and full body covering that fits snugly at the ankles, wrists and neck, manufactured by Dupont Tyvek, Kimberley Clarke or other approved equivalent manufacturer.
8. **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.
9. **Sprayer:** Garden type portable manual sprayer or water hose with spray attachment if suitable.
10. **Tape:** Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.



11. **Warning labels and signs:** delineating entry and protective equipment requirements and providing warning of the potential health effects of exposure to airborne lead dust.
12. **Wetting Agent:** Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

### 3.10 Lead Waste and Material Handling

1. Compressed air or dry sweeping cleaning methods are not to be used.
2. Lead-containing batteries are to be transported in suitable rigid containers and sent for recycling or proper disposal.
3. Paint samples are to be submitted for toxic characteristics leachate procedure (TCLP) testing as per O. Reg. 347, as amended. A representative sample of the bulk debris will be sent to an accredited laboratory for TCLP analysis for waste stream identification validation.
4. Conform to requirements outlined in General Waste Management, Ontario Regulation 347, amended to 297/17 for waste management, transporting and disposal of hazardous waste.
5. Carrier of hazardous wastes shall have successfully completed a Transportation of Dangerous Goods course acceptable to the authority having jurisdiction within the past three years.
6. Transport waste lead products in accordance with the Provincial and Federal legislation and regulations.
7. Ensure that all materials are properly packaged and labelled prior to transportation.
8. Provide RiskCheck and TDSB a copy of each waste manifest and/or a letter from the recycling agency acknowledging receipt of the materials.

### 3.11 Lead – Type 1 Abatement Operations

#### 3.11.1 Summary of Project Work Actions

1. Isolate the Project Work Area from adjoining spaces through the installation of temporary barriers and partitions as specified herein.
2. Use Type 1 lead abatement operations in the Project Work Areas that require removal of paint coatings containing lead or installation of fasteners done using a power tool that has an effective dust collection system equipped with a HEPA filter.
3. The intent of this section is to provide safe work practices and procedures to govern the handling, removal, clean-up, and disposal of lead following Type 1 procedures, including any of the Consultant's and Client's specific requirements.



### 3.11.2 Worker Personal Protection

In addition to the guidelines outlined in *Section 1.6 – General Personnel Health, Safety and Training* and *Section 3.6 - Worker Protection*, the Abatement Contractor should comply by the following:

1. Always protect all personnel when the exposure to lead dust exists.
2. Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters when requested by personnel.

### 3.11.3 Inspection Milestones

1. The following Milestone Inspections are recommended to be scheduled:

#### **Milestone Inspection A - Clean Site Preparation**

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

#### **Milestone Inspection B - Bulk Removal Inspection**

- ✓ Inspection during lead removal, monitoring removal methods, site deficiencies, performing occupied air monitoring, etc.

#### **Milestone Inspection C - Visual Clearance**

- ✓ Inspection of the Project Work Area after completion of all abatement, but prior to the dismantling of enclosure (if present).

### 3.11.4 Project Work Area Preparation and Maintenance

1. Provide washing facilities consisting of a wash basin, clean water, soap and towels.
  - ✓ Workers are to use washing facilities each time leaving the Project Work Area.
2. Remove and place any required items to facilitate the work in an area outside of the Project Work Areas for clean waste without creating or disturbing lead dust.
3. Drop sheets shall be placed directly below each work area to control fallen dust and debris if no enclosure is required.
4. Install signage in clearly visible locations and in sufficient numbers to adequately warn of a lead dust hazard.
5. Shut down HVAC systems serving the Project Work Area.
  - ✓ Install polyethylene sheeting over openings in ducts and diffusers and seal.



6. Remove visible dust and friable material from all surfaces in the Project Work Area including those to be worked on, using HEPA Vacuums or wet wiping.
7. Do not use compressed air to clean or remove dust or debris.
8. Provide amended water for wetting materials, and adequate method of wetting (garden sprayers, airless sprayers, etc.).
9. Provide power from ground fault interrupt circuits.
10. Ensure that all holes or openings in existing wall, ceiling and floor structures are adequately sealed.
11. Schedule and obtain written approval of **Milestone Inspection A** - Clean Site Preparation before proceeding.
12. Maintain the Project Work Area in orderly condition.
13. Remove waste and debris frequently.
14. Remove standing water on polyethylene/floor at the end of every shift.
15. Turn off water supply to hoses and reduce pressure in hose, prior to leaving the Project Work Area at end of shift.

#### **3.11.5 Type 1 Lead Removal**

1. Notify the Consultant of **Milestone Inspection B** – Bulk Removal Inspection when the abatement project is underway.
2. Workers shall follow and enforce the worker protection standards as listed in *Section 1.5 – General Personnel Health, Safety and Training*, *Section 3.6 - Worker Protection* and *Section 3.11.2 – Worker Personal Protection*.
3. Removal methods minimizing dust generation should be used wherever possible:
  - ✓ Wet methods are to be used to reduce dust generation;
  - ✓ Wetting agents should be used where possible; and
  - ✓ Wet methods are not to be used if it creates a hazard or cause damage to equipment or to project.
4. Wastewater from cleaning or removal operations must be contained, for treatment or disposal.
5. Remove lead-containing paint in small sections and pack as it is being removed in sealable lead waste containers.
6. Waste generated should be maintained wet until cleaned and packaged.



7. Follow manufacturer's instructions for all use of chemical gels, strippers and pastes:
  - ✓ Ensure agent neutralizers, where required, are applied; and
  - ✓ Do not use chemical gels, strippers or pastes on surfaces where they are scheduled to be repainted, and the material affect the new paint application.
8. After completion of stripping work, use a wire brush and wet sponge on the surface which lead based paint has been removed to remove visible material while keeping the surfaces wet.
9. After wire brushing and wet sponging to remove visible lead-containing paint, wet clean the entire Project Work Area including the equipment used in the lead removal process:
  - ✓ Do not use compressed air to clean or remove lead-containing dust or debris; and
  - ✓ Ensure all waste is cleaned and packaged.
10. Locate and remove lead-containing emergency back up batteries as required.
11. Seal filled containers and clean external surfaces thoroughly by wet sponging. Remove from the immediate working area to the staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside.

#### **3.11.6 Project Work Area Dismantling**

1. Remove polyethylene sheet by rolling it away from walls to the centre of the Project 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.
4. Notify the Consultant of **Milestone Inspection C** - Visual Clearance.

#### **3.11.7 Inspection**

1. Perform **Milestone Inspection C** - Visual Clearance inspection of work area following the removal of lead products.

### **3.12 Lead – Type 2a Abatement Operations**

#### **3.12.1 Summary of Project Work Actions**



1. Isolate the Project Work Area from adjoining spaces through the installation of containments (if required) as specified herein.
2. Using Type 2a lead abatement operations, remove lead paint from the Project Work Areas that require removal of paint coatings containing lead by manual scraping, or manual demolition of building finishes with lead containing paint.
3. The intent of this section is to provide safe work practices and procedures to govern the handling, removal, clean-up, and disposal of lead following Type 1 procedures, including any of the Consultant's and Client's specific requirements.

### **3.12.2 Worker Personal Protection**

In addition to the guidelines outlined in *Section 1.6 – General Personnel Health, Safety and Training* and *Section 3.6 - Worker Protection*, the Abatement Contractor should comply by the following:

1. Always protect all personnel when the exposure to lead dust exists.
2. Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters when requested by personnel.

### **3.12.3 Inspection Milestones**

1. The following Milestone Inspections are recommended to be scheduled:

#### **Milestone Inspection A - Clean Site Preparation**

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

#### **Milestone Inspection B - Bulk Removal Inspection**

- ✓ Inspection during lead removal, monitoring removal methods, site deficiencies, performing occupied air monitoring, etc.

#### **Milestone Inspection D – Clearance Sampling**

- ✓ Lead wipe sampling should be within acceptable limits prior to the dismantling of enclosure (if present).

### **3.12.4 Project Work Area Preparation and Maintenance**

1. Provide washing facilities consisting of a wash basin, clean water, soap and towels.
  - ✓ Workers are to use washing facilities each time leaving the Project Work Area.





2. Remove and place any required items to facilitate the work in an area outside of the Project Work Areas for clean waste without creating or disturbing lead dust.
3. Drop sheets shall be placed directly below each work area to control fallen dust and debris if no containment is required.
4. Install signage in clearly visible locations and in sufficient numbers to adequately warn of a lead dust hazard.
5. Shut down HVAC systems serving the Project Work Area.
  - ✓ Install polyethylene sheeting over openings in ducts and diffusers and seal.
6. Remove visible dust and friable material from all surfaces in the Project Work Area including those to be worked on, using HEPA Vacuums or wet wiping.
7. Do not use compressed air to clean or remove dust or debris.
8. Provide amended water for wetting materials, and adequate method of wetting (garden sprayers, airless sprayers, etc.).
9. Provide power from ground fault interrupt circuits.
10. Ensure that all holes or openings in existing wall, ceiling and floor structures are adequately sealed.
11. Schedule and obtain written approval of **Milestone Inspection A** - Clean Site Preparation before proceeding.
12. Maintain the Project Work Area in orderly condition.
13. Remove waste and debris frequently.
14. Remove standing water on polyethylene/floor at the end of every shift.
15. Turn off water supply to hoses and reduce pressure in hose, prior to leaving the Project Work Area at end of shift.

### 3.12.5 Containment Construction

If a containment is required, construct the following:

1. Construct a Transfer Room as follows:
  - ✓ Transfer Room to be generally 2000 mm x 2000 mm x 2200 mm high. Increase size accordingly to accommodate number of workers;



- ✓ Install walls as follows:
    - Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates; and
    - Install one layer rip-proof polyethylene sheeting on interior walls of the Transfer Room.
  - ✓ Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting beneath the entire Transfer Room;
  - ✓ Install one layer rip-proof polyethylene sheeting over roof;
  - ✓ Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls; and
  - ✓ Install a fire extinguisher, mount to wall.
2. Construct curtained doorways as follows:
- ✓ Install two flap doors, full width and height of door opening at all doors to the Project Work Area and both ends of the Transfer Room;
  - ✓ 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;
  - ✓ Install weights attached to bottom edge of each door flap; and
  - ✓ Provide direction arrows on flaps to indicate opening.
3. Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.
4. Schedule and obtain written approval of **Milestone Inspection A** - Clean Site Preparation before proceeding.

### 3.12.6 Type 2a Lead Removal – No Containment Required

1. Notify the Consultant of **Milestone Inspection B** – Bulk Removal Inspection when abatement project is underway.
2. Workers shall follow and enforce the worker protection standards as listed in *Section 1.5 – General Personnel Health, Safety and Training*, *Section 3.6 - Worker Protection* and *Section 3.12.2 – Worker Personal Protection*.
3. A containment is not required to perform the following lead removal procedures:
  - ✓ Removal of lead containing paint using power tools with an effective dust collection system equipped with HEPA filter.
4. Removal methods minimizing dust generation should be used wherever possible:
  - ✓ Wet methods are to be used to reduce dust generation;
  - ✓ Wetting agents should be used where possible; and
  - ✓ Wet methods are not to be used if it creates a hazard or cause damage to equipment or to project.
5. Wastewater from cleaning or removal operations must be contained, for treatment or disposal.



6. Remove lead-containing paint in small sections and pack as it is being removed in sealable lead waste containers.
7. Waste generated should be maintained wet until cleaned and packaged.
8. Follow manufacturer's instructions for all use of chemical gels, strippers and pastes:
  - ✓ Ensure agent neutralizers, where required, are applied; and
  - ✓ Do not use chemical gels, strippers or pastes on surfaces where they are scheduled to be repainted, and the material affect the new paint application.
9. After completion of stripping work, use a wire brush and wet sponge on the surface which lead based paint has been removed to remove visible material while keeping the surfaces wet.
10. After wire brushing and wet sponging to remove visible lead-containing paint, wet clean the entire Project Work Area including the equipment used in the lead removal process:
  - ✓ Do not use compressed air to clean or remove lead-containing dust or debris; and
  - ✓ Ensure all waste is cleaned and packaged.
11. Locate and remove lead-containing emergency back up batteries.
12. Seal filled containers and clean external surfaces thoroughly by wet sponging. Remove from the immediate working area to the staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside.

#### 3.12.7 Type 2a Lead Removal – Containment Required

1. Notify the Consultant of **Milestone Inspection B** – Bulk Removal Inspection when abatement project is underway.
2. Workers shall follow and enforce the worker protection standards as listed in *Section 1.5 – General Personnel Health, Safety and Training*, *Section 3.6 - Worker Protection* and *Section 3.12.2 – Worker Personal Protection*.
3. In addition to the procedures in *Section 13.12.6 – Type 2a Lead Removal – No Containment Required*, perform the following lead removal procedures **within a containment**:
  - ✓ Removal of lead-containing surface coatings or materials by scraping or sanding (including wet sanding) using non-powered hand tools; and
  - ✓ Demolition of plaster or other building components that crumble, pulverize or powder and are covered with lead-containing surface coating.
4. Notify the Consultant of **Milestone Inspection D** – Clearance Sampling.



### 3.12.8 Inspection

1. Perform **Milestone Inspection D** – Clearance Sampling inspection using lead wipe sampling of work area following the removal of lead products and prior to the dismantling of the Project Work Area.

### 3.12.9 Project Work Area Dismantling

1. Following specified cleaning procedures, and when lead wipe sampling is below acceptable concentrations proceed with final cleanup.
2. Remove polyethylene sheet by rolling it away from walls to centre of the Project Work Area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
3. Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
4. Clean the Project Work Area and Transfer Room, where present.
5. Remove sealed waste containers and equipment used in work and remove from the Project Work Area at appropriate time in cleaning sequence.
6. Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

## 4.0 MERCURY CONTAINING MATERIALS ABATEMENT

### 4.1 General Information

This section includes requirements for identification, removal, transportation, and permanent disposal of mercury-containing fluorescent lamps and thermostat switches.

Furnish all labour, materials, services, insurance and equipment, in accordance with requirements of General – Waste Management, R.R.O. 1990, Reg. 347 (as amended by O. Reg. 324/22) and other regulatory agencies (as listed in *Section 4.3 – Regulations, Codes and Guidelines*) to complete the work of this section.

Work will be subject to inspection by RiskCheck (the Consultant).

### 4.2 Site Conditions

The following mercury-containing products have been confirmed to be present at the Project Work Areas:

- ✓ Mercury-containing fluorescent lamps.

Quantities and site conditions to be confirmed by the Abatement Contractor and any discrepancies are to be reported to the Consultant.

### 4.3 Regulations, Codes and Guidelines

1. Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.
2. Where regulations are not present, follow accepted industry standards and applicable guideline documents.
3. Regulations and guidelines include but are not limited to the following:
  - ✓ *Environmental Protection Act, Revised Statutes of Ontario 1990, Chapter E. 19.*
  - ✓ *Canadian Environmental Protection Act, Revised Statutes of Canada 1999, Chapter C. 33.*
  - ✓ *Ministry of Environmental Regulations for the disposal of mercury waste, including R. R. O. 1990, Regulation 347 as amended.*
  - ✓ *Transportation of Dangerous Goods Act, 1992 (Canada).*
  - ✓ *General Waste Management, Ontario Regulation 347, as amended.*
  - ✓ Other legislation and regulations which apply to the performance of the work of this section.

### 4.4 Instruction and Training

1. Ensure that all workers likely to handle mercury-containing items are trained in the use of Mercury Spill Kit and are trained in the handling of mercury.
2. Removal Abatement Contractor Qualifications: Use qualified electrician to isolate the power for removal of fluorescent light tubes or other mercury-containing equipment.
3. Disposal Abatement Contractor Qualifications: Carrier of hazardous wastes shall have successfully completed a Transportation of Dangerous Goods course acceptable to the authority having jurisdiction within the past three years.
4. Workers must have training on the hazards of mercury.



## 4.5 Worker Protection

1. The Abatement Contractor is to provide all necessary skin, eye and respiratory protective equipment for the safe handling of mercury as per regulatory requirements.
2. Workers shall not eat, drink, smoke or chew gum in work area.

## 4.6 Products, Materials and Equipment

1. **Cardboard Containers:** New or used cardboard boxes suitable for packaging of fluorescent light tubes, compact fluorescent bulbs and thermostats to prevent breakage.

## 4.7 Inspection Milestones

1. The following Milestone Inspection may take place, at the Client's cost, as outlined in each related specification section:

### Milestone Inspection C - Visual Clearance

- ✓ Inspection of the Project Work Area after removal of all mercury-containing items and waste.

## 4.8 Packaging of Mercury-Containing Fluorescent Tubes and Bulbs

1. Locate and carefully remove designated fluorescent light tubes/bulbs from fixtures and place in cardboard or other container to prevent breakage.
2. Place the tubes/bulbs immediately as they are removed from fixtures ensuring that items are packaged in a manner to prevent breakage. Avoid rough handling of the tubes/bulbs to avoid breakage. When containers are full, store in a secure location on site until removed.

## 4.9 Packaging of Other Mercury-Containing Items

1. Place polyethylene drum liner in Containment Drum. Pour a minimum of 200 mm layer of vermiculite into the liner. Place smaller mercury items in Containment Drum in a manner to prevent breakage. Avoid rough handling of mercury items to avoid damage. When full or all items are placed in Drum, seal liner bag with duct tape and place completed label on outside of Containment Drum. Store Containment Drums in a secure location.

## 4.10 Mercury Waste and Material Handling and Disposal

1. Transport mercury-containing materials in accordance with the Provincial and Federal legislation and regulations.

2. Ensure that all mercury-containing materials are properly packaged and labelled prior to transportation.
3. Use an approved recycling company for permanent disposal of mercury-containing materials.

#### 4.11 Appropriate Documentation

1. Provide RiskCheck and TDSB a copy of each waste manifest and/or a letter from the recycling agency acknowledging receipt of the materials.

#### 4.12 Inspection

1. Perform **Milestone Inspection C** – Visual Clearance inspection of the Project Work Area following the removal of mercury.

### 5.0 SILICA ABATEMENT

#### 5.1 General Information

This section covers the identification, removal, transportation, and permanent disposal or recycling of silica products.

Furnish all labour, materials, services, insurance and equipment, in accordance with requirements of Section 4.4 of the Ministry of Labour Guideline - Silica on Construction Projects, April 2011 and other regulatory agencies (as listed in *Section 7.3 – Regulations, Codes and Guidelines*) to complete the work of this section.

Work will be subject to periodic inspection by RiskCheck (the Consultant).

#### 5.2 Site Conditions

The following materials in the Project Work Areas have been **confirmed to contain silica in crystalline form:**

- ✓ Concrete, masonry, drywall, ceiling tiles, mortar, and ceramic products.

Quantities and site conditions to be confirmed by the Abatement Contractor and any discrepancies are to be reported to the Consultant.

#### General Building Conditions

1. Power and water will remain active for the abatement.
2. Hours of access to be confirmed by TDSB.

### 5.3 Regulations, Codes and Guidelines

1. Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.
2. Where regulations are not present, follow accepted industry standards and applicable guideline documents.
3. Regulations and guidelines include but are not limited to the following:
  - ✓ *Section 4.4 of the Ministry of Labour Guideline - Silica on Construction Projects, April 2011).*
  - ✓ *Environmental Protection Act, 1999 (Canada).*
  - ✓ *Transportation of Dangerous Goods Act, 1992 (Canada).*

### 5.4 Classification of Work

Type 1 and Type 3 silica abatement operations will not apply during the abatement operations.

1. **Type 2** silica operation will be implemented if abatement consists of the following:
  - ✓ The use of a power tool to cut, grind, or polish concrete, masonry, terrazzo or refractory materials; and
  - ✓ The use of a power tool to remove silica-containing materials.

### 5.5 Instruction and Training

1. Workers involved with the disturbance of silica-containing materials should be trained in preventing silica exposure as outline in Section 4.4 of the Ministry of Labour Guideline - Silica on Construction Projects, April 2011.
2. Workers must have training on the hazards of Silica.

### 5.6 Worker Protection

1. The Abatement Contractor is to provide all necessary skin, eye and respiratory protective equipment for the protection against silica as per regulatory requirements.
2. Workers shall not eat, drink, smoke or chew gum in the Project Work Area.
3. Washing facilities, including clean water, soap and towels, should be provided to the workers involved and personal decontamination procedures should be conducted when leaving the Project Work Area and prior to eating, drinking, smoking, etc. Silica-containing dust on personal protective



clothing and equipment should be removed by damp wiping or HEPA vacuuming and handled with care to prevent disturbing the silica dust and the generation of airborne silica dust.

4. Respiratory Protection in the form of one of the following:

- ✓ Full-facepiece air-purifying respirator with any 100-series particulate filter;
- ✓ Tight-fitting powered air-purifying respirator with any 100-series particulate filter;
- ✓ Full-facepiece supplied-air respirator operated in demand mode; and
- ✓ Half-mask or full-facepiece supplied air respirator operated in continuous-flow mode.

5. Respirators shall be:

- ✓ Certified by the National Institute of Occupational Safety and Health (NIOSH) or another testing agency acceptable to the Provincial regulator;
- ✓ Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter the Project Work Area has facial hair which affects the seal between respirator and face;
- ✓ Assigned to a worker for their exclusive use;
- ✓ Maintained in accordance with manufacturer's specifications;
- ✓ Cleaned, disinfected, and inspected by a competent worker after use on each shift, or more often if required;
- ✓ Repaired or have damaged or deteriorated parts replaced;
- ✓ Stored in a clean and sanitary location;
- ✓ Provided with new filters as necessary, according to manufacturer's instructions;
- ✓ Worn by personnel who have been fit checked by qualitative or quantitative fit-testing; and
- ✓ Instruction on proper use of respirators must be provided by a competent worker as defined by the Occupational Health and Safety Act.

6. Provide protective clothing, to all personnel which:

- ✓ Is made of a material that does not readily retain nor permit penetration of silica dust;
- ✓ Includes but is not limited to coveralls or full body work clothing; gloves, hats, and footwear or disposable coverlets;
- ✓ Safety glasses, face shields or goggles.
- ✓ All clothing that has been worn in a silica-contaminated area must be removed at the end of each shift and be decontaminated. Clothing should not be taken home; and
- ✓ Is replaced or repaired if torn or ripped.

7. Use hard hats, safety footwear and other protective equipment and apparel required by applicable construction safety regulations.

## 5.7 Inspection Milestones

1. The following Milestone Inspection may take place, at the Client's cost, as outlined in each related specification section:



### Milestone Inspection C - Visual Clearance

- ✓ Inspection of the Project Work Area after removal of all silica-containing items and waste.

## 5.8 Containment Requirements

1. Workers not involved with the silica abatement operations and who do not have appropriate PPE should remain at least 10 metres away from the Project Work Area.
2. Ropes or barriers should be set up to prevent unauthorized personnel from entering the Project Work Area.
3. If ropes and barriers are not possible and there are workers within the 10-metre limit, the Project Work Area should be enclosed (in the form of a partial enclosure, or full enclosure) to prevent the escape of airborne silica-containing dust

### 5.8.1 Barriers

1. Use ropes or barriers to restrict access of workers who are not adequately protected with proper PPE.
2. If this is not achievable, warning signs should be posted at the distance where the silica-containing dust settles (i.e., at least 10 metres away from the Project Work Area).

### 5.8.2 Partial Enclosures

1. Partial enclosures allow some level of emission to the atmosphere outside of the enclosure.
2. Partial enclosures may consist of vertical tarps and floor tarps so long as the tarps are overlapped and securely fixed together at the seams.
3. A partial enclosure is not a recommended containment system if significant dust is being generated.

### 5.8.3 Full Enclosures

1. Full enclosures are tight enclosures (with tarps that are generally impermeable and fully sealed joints and entryways). Full enclosures allow minimal or no fugitive emissions to reach the outside environment.

## 5.9 Silica – Type 2 Abatement Operations

1. Signs should be posted in enough numbers to warn of the silica hazard. The signs should display there is a silica dust hazard, restriction of the Project Work Area to authorized personnel, and that respirators must be worn in the Project Work Area.



2. Drop sheets shall be placed directly below each work area to control fallen dust and debris.
3. Drop sheets shall be disposed of following the completion of each project and new drop sheets shall be placed at each new work area.
4. Material should be misted with water prior to disturbance to help control the spread of dust.
5. At frequent intervals throughout the project, efforts to clean the Project Work Area should be made to help control the spread of dust and include damp wiping and HEPA vacuuming.
6. Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.
7. Notify the Consultant of **Milestone Inspection C** - Visual Clearance.

## 5.10 Silica Waste and Material Handling

1. Compressed air or dry sweeping cleaning methods are not to be used.
2. Conform to requirements outlined in General Waste Management, Ontario Regulation 347 (as amended) for waste management, transporting and disposal of hazardous waste.

## 5.11 Inspection

1. Perform **Milestone Inspection C** - Visual Clearance inspection of the Project Work Area following the removal of silica products, dust and debris.



