City of Peterborough
500 George Street North
Peterborough, ON, K9H 3R9
peterborough.ca | 1-855-738-3755

Date: February 2, 2026,

Re: **ITT-17-26 Elevator Modernization - Queen Alexandra Community Centre**

Take notice that the City of Peterborough has issued addendum number 4 for Invitation to Tender # ITT-17-26 which is the fourth addendum issued to date.

You will be required to confirm you have downloaded and reviewed this addendum in bids&tenders™ prior to submitting your bid.

The following outlines amendments to the original documentation for the above noted Invitation to Tender.

Item 1 – Questions and Answers

Question 1:

Please clarify if this is a heritage building and any special conditions to consider.

Answer 1:

No, it is not designated as a heritage building.

Question 2:

Is there any abatement of hazardous materials/ DSS report for this tender?

Answer 2:

Refer to the following attachments:

- **Attachment 7 – Queen Alexandra Community Centre HBM Survey (DSS)**.
- **Attachment 8 – Hazardous Materials Abatement Specifications**.

End of Addendum 4

OHE CONSULTANTS
Occupational Hygiene & Engineering

PRE-RENOVATION
HAZARDOUS BUILDING MATERIALS SURVEY

Elevator Renovation Project
Queen Alexandra Community Centre
180 Barnardo Avenue
Peterborough, Ontario
K9H 5V3

Presented to:

City of Peterborough
500 George Street North
Peterborough, Ontario
K9H 3R9

January 2026

OHE Project No.: 31856

Submitted by:

OHE Consultants
Occupational Hygiene & Engineering
311 Matheson Blvd. East
Mississauga, Ontario
L4Z 1X8

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EXECUTIVE SUMMARY

OHE Consultants (OHE) was retained by the City of Peterborough (Client) to conduct a Hazardous Building Materials Survey (HBMS) as part of the Elevator Renovation Project at Queen Alexandra Community Centre located at 180 Barnardo Avenue, Peterborough, Ontario (herein referred to as the "Subject Location").

The field work was carried out on January 19, 2026 by Fred Atrash and Michael Dib, of OHE. The survey consisted of a visual inspection for the presence of hazardous building materials, including designated substances, and testing and sampling of materials suspected to contain hazardous building materials, particularly asbestos and lead.

It should be noted that the elevator shaft was excluded from the scope of this survey as per the client request on site.

Should suspect hazardous materials be discovered in any of the areas which could not be accessed (as part of the survey) during decommissioning and demolition activities, the work shall stop until such materials are assessed and sampled to determine the next course of action.

A summary of the hazardous building materials survey findings is presented below:

Asbestos

- Mechanical Systems Insulation
- Paper material

Lead

- Various paints
- Presumed present in:
  - wiring connectors
  - electric cable sheathing
  - solder joints on copper piping
  - within batteries of emergency lighting
  - ceramic building products such as floor or wall tiles.

Mercury

- Presumed present:
  - as vapour in fluorescent light bulbs
  - in mercury-vapour lamps
  - as a component in electrical equipment, such as silent, position-dependent switches.

Silica

- Presumed present: as fillers for paints and mastic
  in bricks, ceramics, masonry, concrete and mortar.

Radioactive Materials

- Smoke detectors

Mould and Water Damaged Building Materials

- Elevator Room, Basement

The survey was non-destructive in nature. Hazardous building materials may be present in areas not accessible for view and identification. In situations where hazardous building materials extend into a non-accessible area, the materials were assumed to also be present in those areas and have been reported as such. Contractors and maintenance personnel should be warned of the possibility of undisclosed hazardous building materials in enclosed areas. All hazardous building materials discovered in these areas should be treated as such until proven otherwise as per all applicable regulations and guidelines.

Hazardous building materials including asbestos are also assumed to be present in various building materials which were not sampled as part of the survey since they were excluded from the scope of work due to inaccessibility. These materials include, but are not limited to, high voltage wiring, transformers and associated equipment; mechanical packing, gaskets; and refractory materials within boilers and furnaces. All excluded materials shall be assumed asbestos-containing until proven otherwise by bulk sampling and analysis.

OHE's recommendations, based on the findings of the survey, are as follows:

- Provide a copy of this report to contractors bidding on or performing work within the Subject Location;

- Remove all asbestos-containing materials that are likely to be disturbed during renovation or demolition activities in accordance with all applicable guidelines and regulations.

- Remediate (cleanup and repair, remove, enclose, or encapsulate) all damaged ACMs (i.e., those noted to be in fair and/or in poor condition) in accordance with all applicable guidelines and regulations.

- Renovations and/or demolition operations that are likely to generate lead-containing dust shall be carried out in accordance with all applicable guidelines and regulations.

- Renovations and/or demolition operations that are likely to disturb mercury-containing materials or equipment shall be carried out in accordance with all applicable guidelines and regulations.

- Renovations and/or demolition operations that are likely to generate silica-containing dust shall be carried out in accordance with all applicable guidelines and regulations.

- Examine all light ballasts after dismantling and prior to disposal to determine its PCB content. PCB-containing light ballasts should be disposed of following procedures specified in applicable regulations.

- Mould and water damaged building materials shall be remediated following remediation procedures as outlined in the Canadian Construction Association Standard construction document CCA 82-2004 “Mould Guidelines for the Canadian Construction Industry.”

- Examine all smoke detectors after dismantling and prior to disposal to determine potential radioactive content.

- Prior to remediation, the source of water intrusions that lead to the mould growth or water damage should be identified and repaired.

- Disposal of hazardous building materials shall be completed as per all applicable guidelines and regulations.

- Should suspect hazardous building materials be discovered during any demolition or renovation work in the Subject Location, the contractor shall stop all work in the vicinity of the suspect hazardous material and immediately notify personnel from both the City of Peterborough and OHE Consultants.

This executive summary provides a brief overview of the survey findings. It is not intended to substitute for the complete survey report, nor does it discuss specific issues

documented in the report. The executive summary should not be used as a substitute to reading the complete report.

This report is not a scope of work/specifications document for the abatement/remediation of hazardous materials and shall not be used for such purposes.

1. INTRODUCTION

OHE Consultants (OHE) was retained by the City of Peterborough (Client) to conduct a Hazardous Building Materials Survey (HBMS) as part of the Elevator Renovation Project at Queen Alexandra Community Centre located at 180 Barnardo Avenue, Peterborough, Ontario (herein referred to as the "Subject Location").

In accordance with Section 30 of the Ontario Occupational Health and Safety Act, Designated Substances and other potentially hazardous building materials must be identified prior to construction or demolition that may disturb such materials. The following is a list of designated substances:

Asbestos	Benzene
Lead	Acrylonitrile
Mercury	Coke Oven Emissions
Silica	Arsenic
Isocyanates	Ethylene Oxide
Vinyl Chloride	

In addition to the above listed designated substances, the scope of the survey also included visual inspection for the presence of the following:

Polychlorinated Biphenyls (PCBs)	Mould
Ozone Depleting Substances (ODSs)	Animal Droppings
Smoke Detectors with Radioactive Source	Stored Chemicals

The field work was carried out on January 2026 by Fred Atrash and Michael Dib, of OHE.

The asbestos bulk samples were analyzed by EMC Scientific Incorporated, an independent and NVLAP accredited laboratory.

1.1. SCOPE OF WORK

The scope of work of the survey consisted of the following:

1. Meeting with key on-site personnel (if provided by the Client) to obtain information about the various operations and processes carried out at the Subject Location in the past;

2. Room-by-room inspection of accessible areas including spaces above suspended ceilings, access hatches, mechanical chases, or similar type locations. Minor demolition of walls, ceilings, floors, etc. to investigate concealed conditions was not part of the scope of work;

3. Bulk sampling and analysis of suspect materials for the presence of asbestos following the requirements of Ontario Regulation 278/05;

4. Sampling of accessible painted surfaces for lead content. The lead survey also included an inventory of paint that is peeling off and require remediation;

5. Survey for PCBs in fluorescent lighting ballasts/HID lamps and electrical equipment;

6. Visual inspection for the presence of the other hazardous building materials listed above. If identified, such materials were reported as suspected until tested. Testing of these materials was not part of the scope of this survey; and

7. Preparation and provision of this report which includes the methodologies, drawings (if they were initially provided by the Client), results, findings, conclusions, recommendations and site photographs.

This report is not a scope of work/specifications document for the abatement/remediation of hazardous materials and shall not be used for such purposes.

1.2. APPENDICES OUTLINE

The following is an outline of the appendices included in the report:

- Drawings showing sampling locations and the locations of asbestos-containing materials (if identified) are presented in Appendix A;
- The **results** of the survey for asbestos and lead in the form of summary tables for each of the materials are presented in Appendix B;
- The laboratory analysis report is presented in Appendix C;
- Select site photographs are presented in Appendix D;
- Background information on hazardous building materials, including a brief discussion of the properties, uses, and hazards associated with exposure, is attached in Appendix E;
- A summary of applicable provincial regulations and guidelines pertaining to hazardous building materials is attached in Appendix F;
- Survey methodology including bulk samples analysis methodology and assessment of hazardous building materials methodology is attached in Appendix G;
- Limitations of the project are attached in Appendix H; and
- Historical data (if applicable) is attached in Appendix I.

1.3. BUILDING(S) DESCRIPTION

	Building 1
Name	Queen Alexandra Community Centre
Address	180 Barnardo Avenue, Peterborough, Ontario
Current usage	Community Centre
Square footage	Approximately 25,000 square feet
Number of Floors	Two (2)
Number of Units	NA
Year Built	In various years
Roof Mechanical penthouse (yes/no)	Yes (Inside the attic)
Number of underground levels	One (1)
General interior finishes	Drywall, plaster, brick, blocks, concrete, carpet flooring, wood, concrete, ceiling tiles, floor tiles, and steel

NA = Not Applicable

2. FINDINGS AND DISCUSSION

2.1. ACMS

Material Description	Observed (yes/no)	Sample(s) Numbers	Asbestos % And Type	Friable/ Non-Friable	Condition	Location
Vinyl Floor Tiles (VFTs), 12”x12”, Beige with brown streaks with adhesive	yes	31856-1A-C	ND			Top layer, Elevator floor
VFTs with adhesive	yes	31856-2A-C	ND			Bottom layer, Elevator Floor
Mortar	yes	31856-3A-C	ND			Gaps between the blocks, North section of the west wall and East section of the north wall, Minor FB Storage 011, Basement
Mortar	yes	31856-4A-C	ND			Gaps between the blocks, East and south walls, Elevator room 012, Basement
Mortar	yes	31856-5A-C	ND			Gaps between the bricks, Gaps between the bricks, North wall, Elevator room 012; gaps between the bricks, South wall, Washroom 018, Basement
Cementitious material, Dark grey	yes	31856-6A-C	ND			Gaps between the north wall and the east wall, Elevator room 012, Basement

Material Description	Observed (yes/no)	Sample(s) Numbers	Asbestos % And Type	Friable/ Non-Friable	Condition	Location
Cementitious material, Light grey	yes	31856-7A-C	ND			Gaps around pipe penetration, East wall, Gaps between the door frame and the south wall, and sealing an opening into the east wall, Elevator room 012, Basement
DJC	yes	31856-8A-C	ND			Ceiling, Elevator room 012, Basement
Mortar	yes	31856-9A-C	ND			Gaps between the stones, West wall, Elevator room 012, Basement
Block wall primer	yes	31856-10A-C	ND			Around the elevator door, South wall, Corridor C02
Mortar	yes	31856-11A-C	ND			Gaps between the blocks, South wall, Corridor C02
DJC	yes	31856-12A-C	ND			South wall, North section and south sections of the east wall, Around the elevator door, Corridor C04, Main floor
DJC	yes	31856-13A-C	ND			South wall by the elevator, Corridor C03, Second floor
MSI, parging cement	**yes**	**Pinchin 150197.003A**	**>75% Chrysotile**	**Friable**	**Fair/poor**	**Pipe fittings, Above DJC ceiling, Elevator room 012, Basement**
Paper material	**yes**	**OHE 13568-4A-C**	**55% Chrysotile**	**Friable**	**-**	**Above metal ceiling, Elevator shaft ceiling**

ND – None Detected

DJC – Drywall Joint Compound

* Not considered asbestos-containing

A summary of the analysis of the bulk samples is presented in Table B.1 found in Appendix B.

ACMs were noted to be in a combination of fair and poor condition. Refer to the Table above for condition and location details.

Where ACMs have been identified to be in fair/poor condition, the materials must be removed or repaired in accordance with applicable guidelines and regulations.

Where ACMs are in good condition and will remain in place, an Asbestos Management Program (AMP) is required.

2.2. Lead

Lead-containing paints were identified at the Subject Location. A detailed description of the colours and locations is presented in Table B.2 found in Appendix B. It is assumed that the results presented apply to all paint(s) of the same colour.

Lead is presumed to be present in wiring connectors and electric cable sheathing, in lead piping, in solder joints on copper piping, in ceramic building products such as floor or wall tiles and within batteries of emergency lighting.

Prior to disturbance of lead-containing materials, the materials must be abated in accordance with applicable guidelines and regulations.

Where lead has been identified to be in fair condition, the materials should be repaired or removed in accordance with applicable guidelines and regulations.

2.3. Mercury

Mercury-containing thermostats were not observed during the survey at the Subject Location.

Mercury is presumed to be present as a vapour in fluorescent light bulbs and mercury-vapour lamps.

Mercury is presumed to be present as a component in electrical equipment, such as silent, position dependent switches.
Prior to disturbance of mercury-containing materials, the materials should be removed in accordance with applicable guidelines and regulations. Simple personal hygiene practices will be sufficient to protect workers from possible mercury exposure.

2.4. Silica

Silica is presumed to be present in materials such as fillers for paints and mastic and in bricks, ceramics, masonry, concrete and mortar.

Silica-containing materials should be handled in accordance with applicable guidelines and regulations. No adverse effects from exposure to silica are likely to occur unless silica in the material is reduced to a respirable size and the airborne concentrations exceed the 8-hour time-weighted average.

2.5. Isocyanates

The material was not identified at the site and is not expected to be found.

2.6. Vinyl Chloride

The material was not identified at the site and is not expected to be found.

2.7. Benzene

The material was not identified at the site and is not expected to be found.

2.8. Acrylonitrile

The material was not identified at the site and is not expected to be found.

2.9. Coke Oven Emissions

The material was not identified at the site and is not expected to be found.

2.10. Arsenic

The material was not identified at the site and is not expected to be found.

2.11. Ethylene Oxide

The material was not identified at the site and is not expected to be found.

2.12. PCBs

Fluorescent light fixtures were observed at the Subject Location during the survey. Light ballasts associated with fluorescent light fixtures are suspected to contain PCBs. The labels on the light ballasts were not accessible for inspection at the time of the survey and their potential PCB content is not known.

PCB-containing equipment should be handled using the appropriate type of procedures as specified in the applicable guidelines and regulations.

2.13. Ozone Depleting Substances

Equipment suspected of containing ozone depleting substances was not observed at the Subject Location during the survey.

2.14. Radioactive Materials

Smoke detectors were observed in the elevator room and Minor FB Storage 011 in the basement during the survey at the Subject Location.

Smoke detectors should be handled using the appropriate type of procedures as specified in the applicable guidelines and regulations.

2.15. Biological Wastes

Potentially hazardous biological wastes such as animal droppings and dead animals were not observed at the Subject Location during the survey.

2.16. Mould and Water Damaged Building Materials

Building/Floor/Location	Building System	Condition	VIMG (Y/N)
Elevator room 012, Basement	Ceiling and west wall	Staining, discolouration	Y

VIMG – Visually Identified Mould Growth

Hazardous building materials may be present in areas not accessible for view and identification. In situations where hazardous building materials extend into a non-accessible area, the materials were assumed to also be present in those areas and have been reported as such. Contractors and maintenance personnel should be warned of the possibility of undisclosed hazardous building materials in enclosed areas. All hazardous building materials discovered in these areas should be treated as such until proven otherwise as per all applicable regulations and guidelines.

3. RECOMMENDATIONS

OHE's recommendations, based on the findings of the survey, are as follows:

- Provide a copy of this report to contractors bidding on or performing work within the Subject Location.

- Remove all asbestos-containing materials that are likely to be disturbed during renovations or demolitions activities in accordance with the following regulations:
  - Ontario Regulation 278/05 (as amended) – "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" (O. Reg. 278/05);
  - Ontario Regulation 490/09 (as amended) – "Designated Substances" (O. Reg. 490/09);
  - Ontario Regulation 213/91 (as amended) - "Construction Projects" (O. Reg. 213/91);
  - Ontario Regulation 347/90 (as amended) - "General - Waste Management" (O. Reg. 347/90); and
  - The regulations respecting the Handling and Offering for Transport and Transporting of Dangerous Goods.

- Remediate (cleanup and repair, remove, enclose, or encapsulate) all the damaged ACMs (i.e., those noted to be in fair and/or in poor condition) in accordance with all applicable regulations.

- Removal of asbestos-containing mechanical systems insulation will require removal operation procedures as specified in O. Reg. 278/05 (Type 2 Glove Bag; Type 2 Operation for ≤1m^2 or Type 3 Operation for >1m^2).

- Removal of asbestos-containing paper material will require removal operation procedures as specified in O. Reg. 278/05 (Type 2 operation for ≤1m^2 or Type 3 Operation for >1m^2).

- Renovations and/or demolition operations that are likely to generate lead-containing dust shall be carried out in accordance with the following guidelines and regulations:
  - Ontario Ministry of Labour Guideline: Lead on Construction Projects;
  - Designated Substances Regulation, O. Reg. 490/09;
  - Regulation for Construction Projects, O. Reg. 213/91; and
  - General – Waste Management Regulation, O. Reg. 347/90.

- Renovations and/or demolition operations that are likely to disturb mercury-containing materials or equipment shall be carried out in accordance with the following guidelines and regulations:
  - Designated Substances Regulation, O. Reg. 490/09;
  - Regulation for Construction Projects, O. Reg. 213/91; and
  - General – Waste Management Regulation, O. Reg. 347/90.

- Renovations and/or demolition operations that are likely to generate silica-containing dust shall be carried out in accordance with the following guidelines and regulations:

- Ontario Ministry of Labour Guideline: Silica on Construction Projects;
- Designated Substances Regulation, O Reg. 490/09;
- Regulation for Construction Projects, O. Reg. 213/91; and
- General – Waste Management Regulation, O. Reg. 347/90.

- Examine all light ballasts after dismantling and prior to disposal to determine their PCB content. PCB-containing light ballasts should be disposed of following procedures specified in applicable regulations.

- Mould and water damaged building materials shall be remediated following remediation procedures as outlined in the Canadian Construction Association Standard construction document CCA 82-2004 "*Mould Guidelines for the Canadian Construction Industry*".

- Examine all smoke detectors after dismantling and prior to disposal to determine potential radioactive content.

- Disposal of hazardous materials shall be conducted in accordance with all applicable regulations and guidelines.

- Should suspect hazardous building materials be discovered during any demolition or renovation work in the above mentioned location, the contractor shall stop all work and immediately notify personnel from the City of Peterborough and OHE.

4. GENERAL STATEMENT OF LIMITATIONS

The information and opinions rendered in this report are for use exclusively by the City of Peterborough and is subject to the terms, conditions and limitations as set out in the proposal/scope of work. OHE Consultants reserves the right to review and comment on any interpretation of the data or conclusions derived by the City of Peterborough. OHE Consultants will not provide this report or other associated information to any party (other than the City of Peterborough) unless the disclosure of the information is required by law or is requested in writing by the City of Peterborough. Any required notifications (internal or external) about information contained in this report shall be the sole responsibility of the Client.

Nothing under the agreement (written or verbal) with the Client shall be construed to give any other rights or benefits to anyone other than the Client and OHE Consultants, and all duties and responsibilities undertaken pursuant to the agreement will be for the sole and exclusive benefit of the Client and OHE Consultants and not for the benefit of any other party. Client agrees not to disclose to any third party data, reports or information provided by OHE Consultants without prior written consent, and OHE Consultants shall have no liability to the Client for claims resulting from such disclosure. However, the Client may use the written report and associated documents to indicate the status of the property to current owners or government requiring the report.

OHE Consultants collected the information provided in this report for the benefit of its Client. OHE Consultants' Client may upon authorization release the information to third parties, who may use and rely upon this report to their discretion. Any use of, or reliance upon, the information by a party other than the Client shall be solely at the risk of the third party and without legal recourse against OHE Consultants.

The scope of this report is limited to possible hazardous building materials found within (or part of) the subject spaces included in the survey only. The survey only considered issues of the building structure, mechanical equipment, and their finishes. The survey did not consider current or past use of the property or occupant articles within the building (i.e. furniture, stock items, etc.), nor does it report on possible contaminants in the soil and groundwater of the site, vessels,

drums, underground storage tanks, etc. The survey consisted of accessible areas only; samples were not collected if accessibility was restricted.
Mould is ubiquitous in the natural environment and any findings presented in the report are only applicable to the time when the actual site investigation was performed. Mould growth could continue to propagate or reoccur if the underlying conditions which initially resulted in mould growth are not rectified regardless of mould remediation efforts and their effectiveness. The scope of this undertaking excluded the completion of a detailed engineering assessment of the facility to determine the potential causes which resulted in the identified mould growth.

OHE Consultants exercised normal skills of a reasonably qualified environmental consultant as part of obtaining the information presented in this report. The findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry at the time of the performance of the work utilizing trained technical staff and professionals.

The information are only representative of the time period when the actual work was carried out. It is possible, due to the nature of building construction, that conditions may exist which could not be reasonably identified within the scope of the assessment or which were not apparent during the site investigation.

The information presented in the report shall not be construed as legal opinion. In addition, the information shall not be used to evaluate health risks of building occupants associated with exposure to identified hazardous building materials – such evaluations shall be carried out by a licensed medical professional who specializes in such evaluations. Over time, the regulations, standards and guidelines which are outlined in the report could be amended/updated, and accordingly may not apply at a future date.

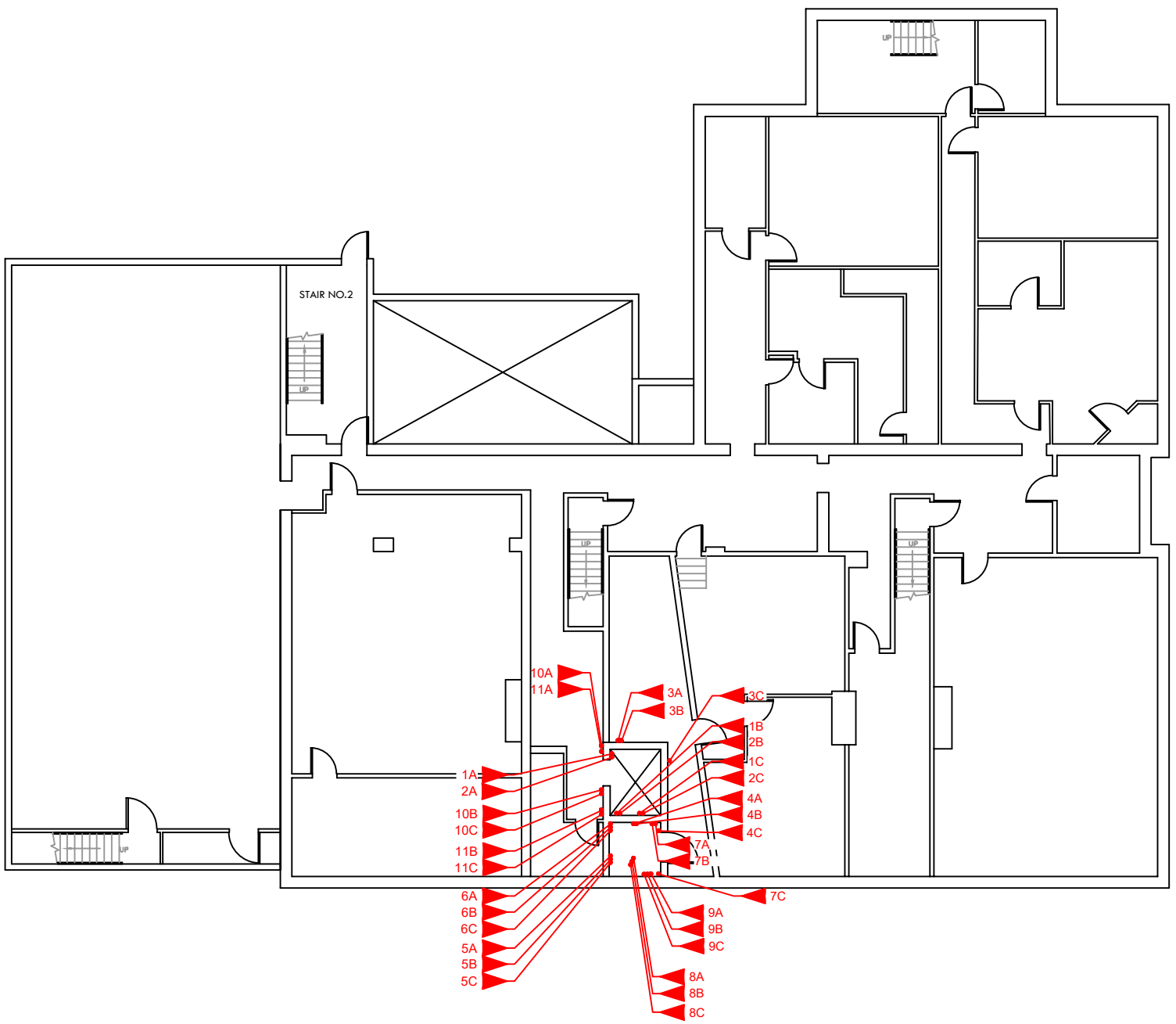
No representation, warranties or guaranties, expressed or implied, are made with respect to any goods or services provided as part of this assessment/report, and any implied warranties or guaranties for a particular purpose are expressly disclaimed.

Dated January 2026

OHE Consultants
Occupational Hygiene & Engineering

Original Signed by:	*Original Signed by*:
Prepared by: Michael Dib Project Manager, B.B.A.	Reviewed by: Fred (Farid) Atrash, M.H.Sc., CIH, ROH President

APPENDIX A DRAWINGS



Legend:

Asbestos Bulk Sample Location

Notes:
Locations of site features are approximate and may vary from that shown

Drawing Title:

Asbestos Bulk Sample Locations

Client Address:

City of Peterborough
500 George St. N.
Peterborough, ON

Project Location:

Queen Alexandra Community Centre
Basement
180 Barnardo Ave.
Peterborough, ON

Project No: 31856

N

Date: Jan 2025

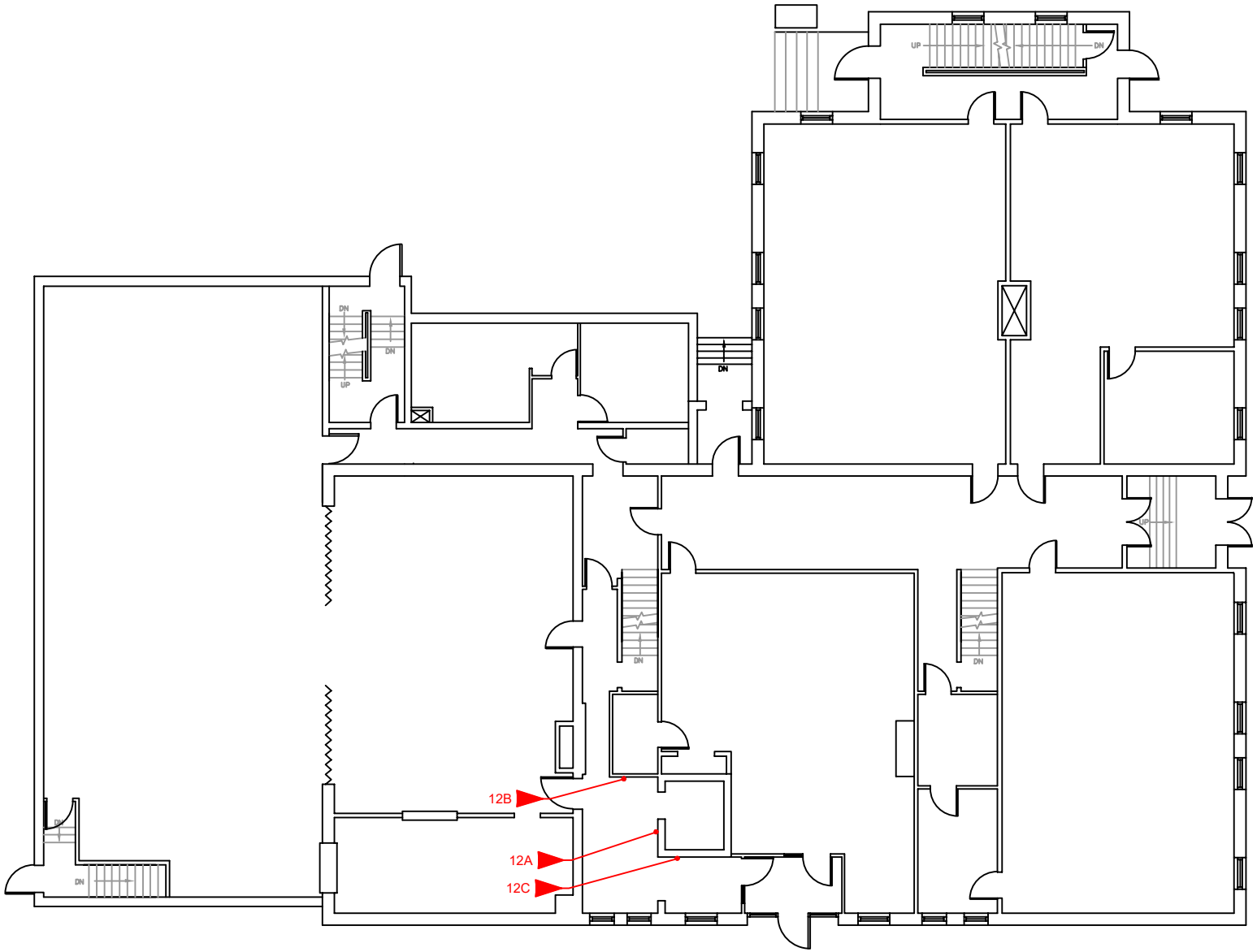
Drawing No: 1.1

Scale: NTS

Drawn By: AB

Approved By: MZ

CONSULTANTS
Occupational Hygiene & Engineering



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xx Asbestos Bulk Sample Location

Notes:
Locations of site features are approximate and may vary from that shown

Drawing Title:

Asbestos Bulk Sample Locations

Client Address:

City of Peterborough
500 George St. N.
Peterborough, ON

Project Location:

Queen Alexandra Community Centre
Main Floor
180 Barnardo Ave.
Peterborough, ON

Project No: 31856

N

Date: Jan 2025

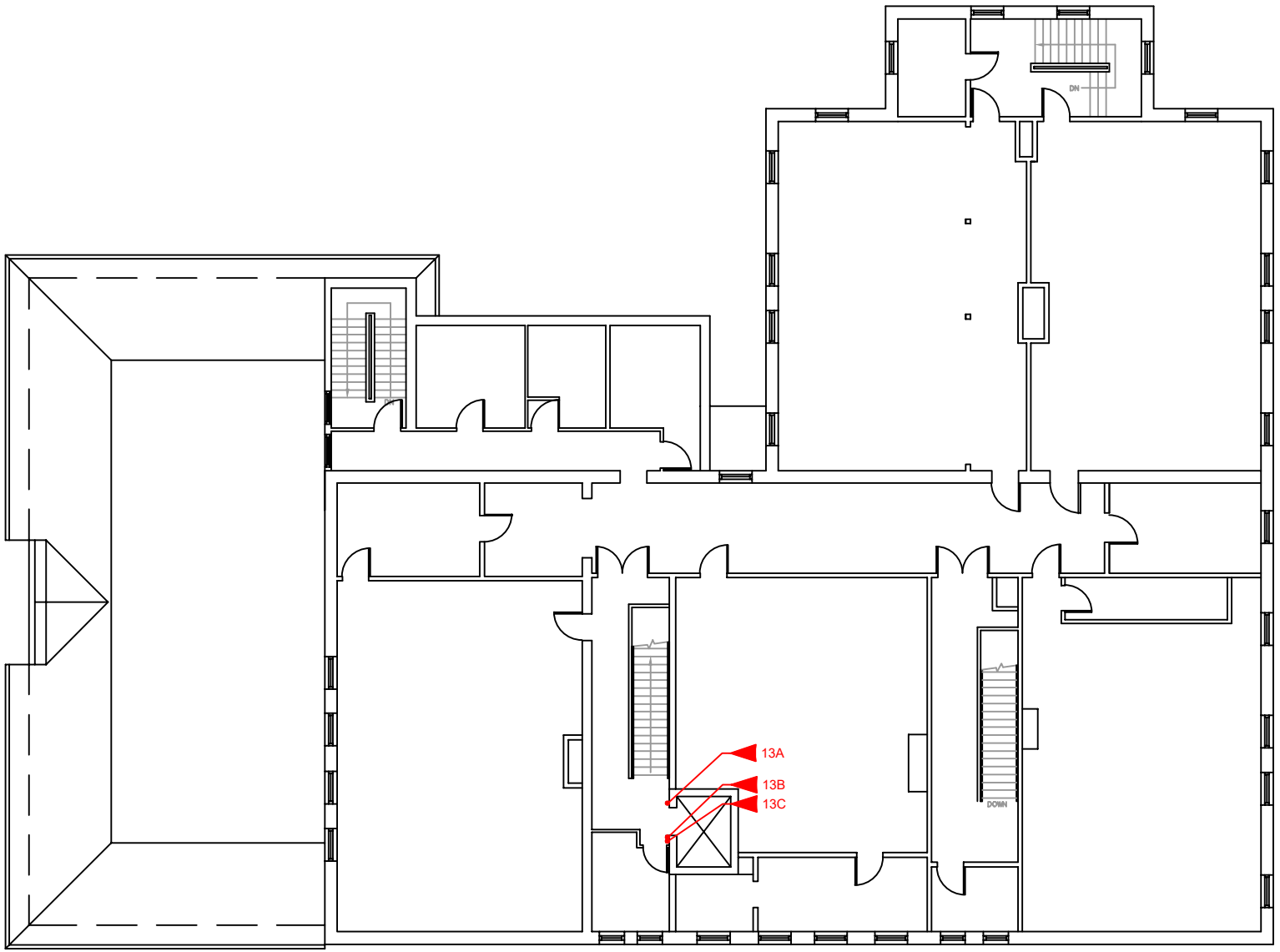
Drawing No: 1.2

Scale: NTS

Drawn By: AB

Approved By: MZ

CONSULTANTS
Occupational Hygiene & Engineering



Legend:

xx Asbestos Bulk Sample Location

Notes:
Locations of site features are approximate and may vary from that shown

Drawing Title:

Asbestos Bulk Sample Locations

Client Address:

City of Peterborough
500 George St. N.
Peterborough, ON

Project Location:

Queen Alexandra Community Centre
Second Floor
180 Barnardo Ave.
Peterborough, ON

Project No: 31856

N

Date: Jan 2025

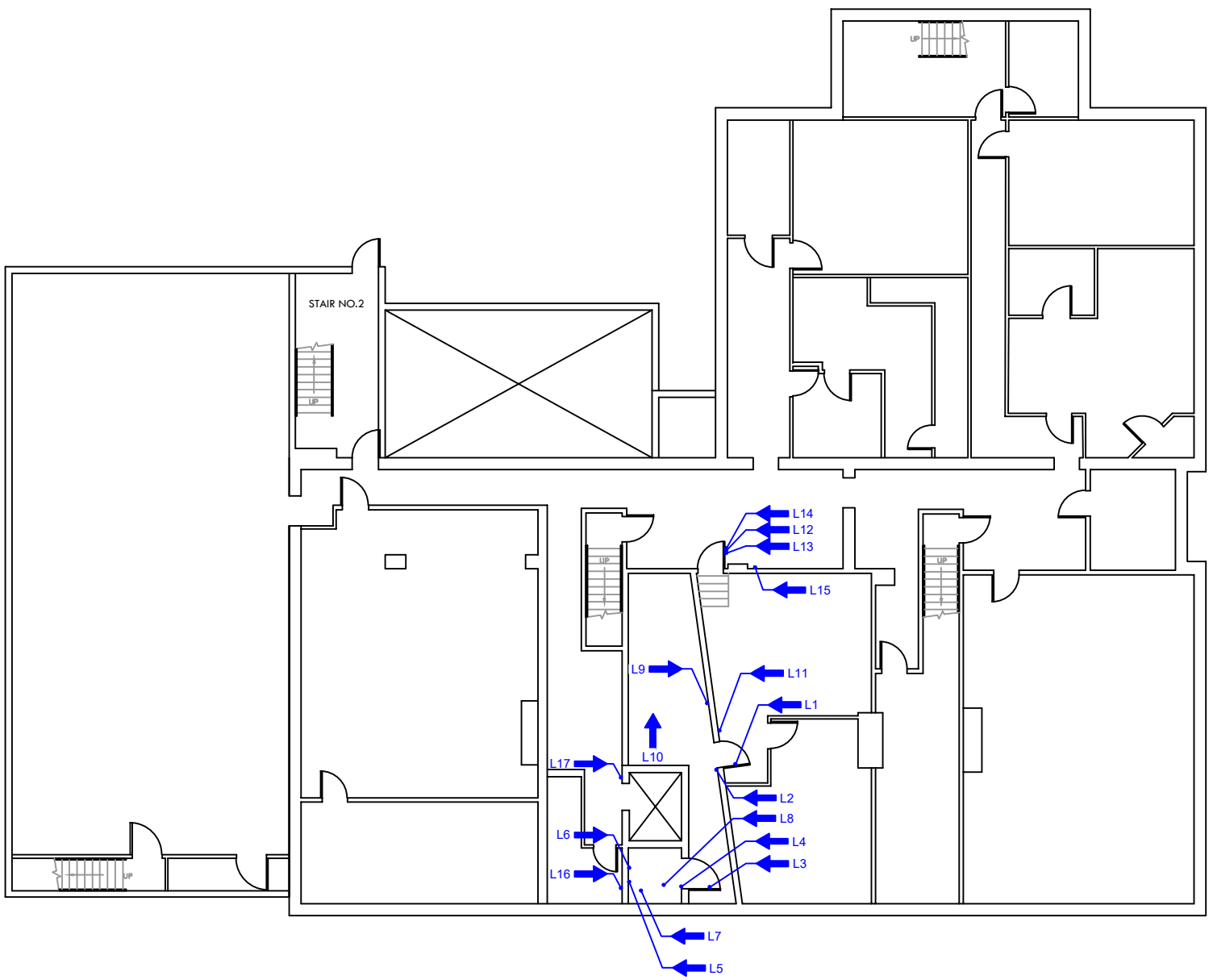
Drawing No: 1.3

Scale: NTS

Drawn By: AB

Approved By: MZ

CONSULTANTS
Occupational Hygiene & Engineering



Legend:

LX XRF Spot Testing Locations

Notes:
Locations of site features are approximate and may vary from that shown

Drawing Title:

XRF Spot Testing Locations

Client Address:

City of Peterborough
500 George St. N.
Peterborough, ON

Project Location:

Queen Alexandra
Community Centre
Basement
180 Barnardo Ave.
Peterborough, ON

Project No: 31856

N

Date: Jan 2025

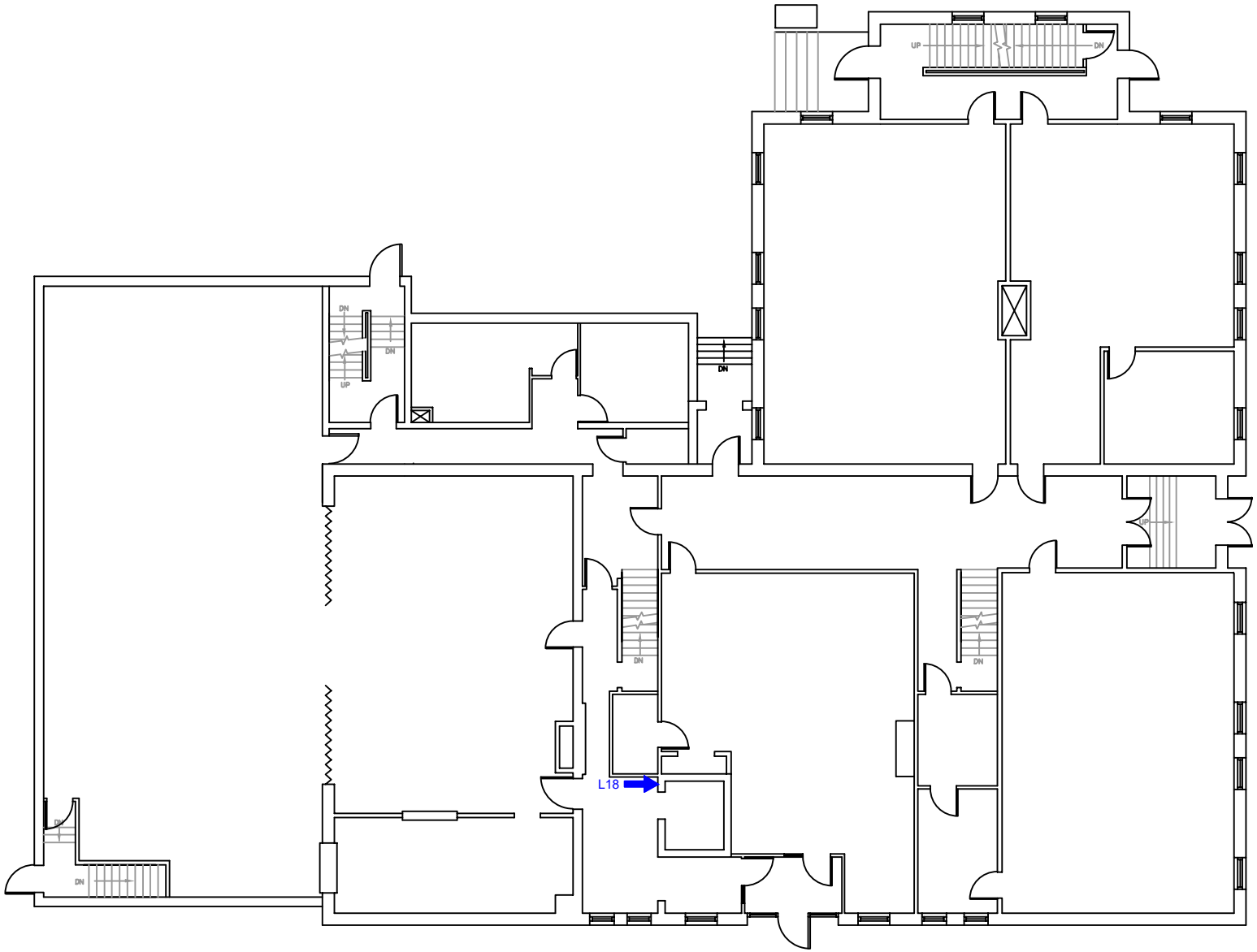
Drawing No: 2.1

Scale: NTS

Drawn By: AB

Approved By: MZ

CONSULTANTS
Occupational Hygiene & Engineering



Legend:

LX XRF Spot Testing Locations

Notes:
Locations of site features are approximate and may vary from that shown

Drawing Title:

XRF Spot Testing Locations

Client Address:

City of Peterborough
500 George St. N.
Peterborough, ON

Project Location:

Queen Alexandra Community Centre
Main Floor
180 Barnardo Ave.
Peterborough, ON

Project No: 31856

N

Date: Jan 2025

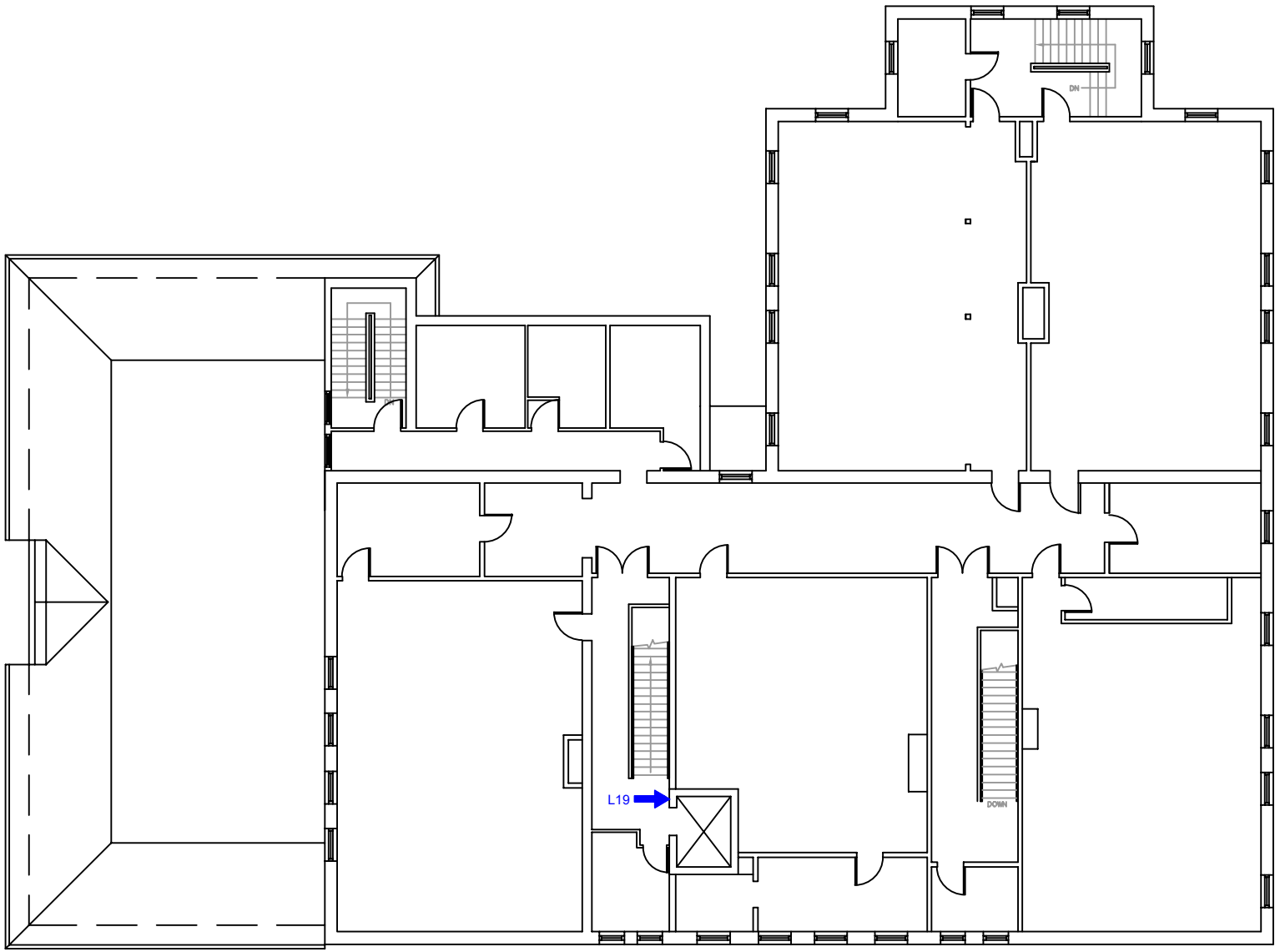
Drawing No: 2.2

Scale: NTS

Drawn By: AB

Approved By: MZ

CONSULTANTS
Occupational Hygiene & Engineering



Legend:

LX XRF Spot Testing Locations

Notes:
Locations of site features are approximate and may vary from that shown

Drawing Title:

XRF Spot Testing Locations

Client Address:

City of Peterborough
500 George St. N.
Peterborough, ON

Project Location:

Queen Alexandra Community Centre
Penthouse
180 Barnardo Ave.
Peterborough, ON

Project No: 31856

N

Date: Jan 2025

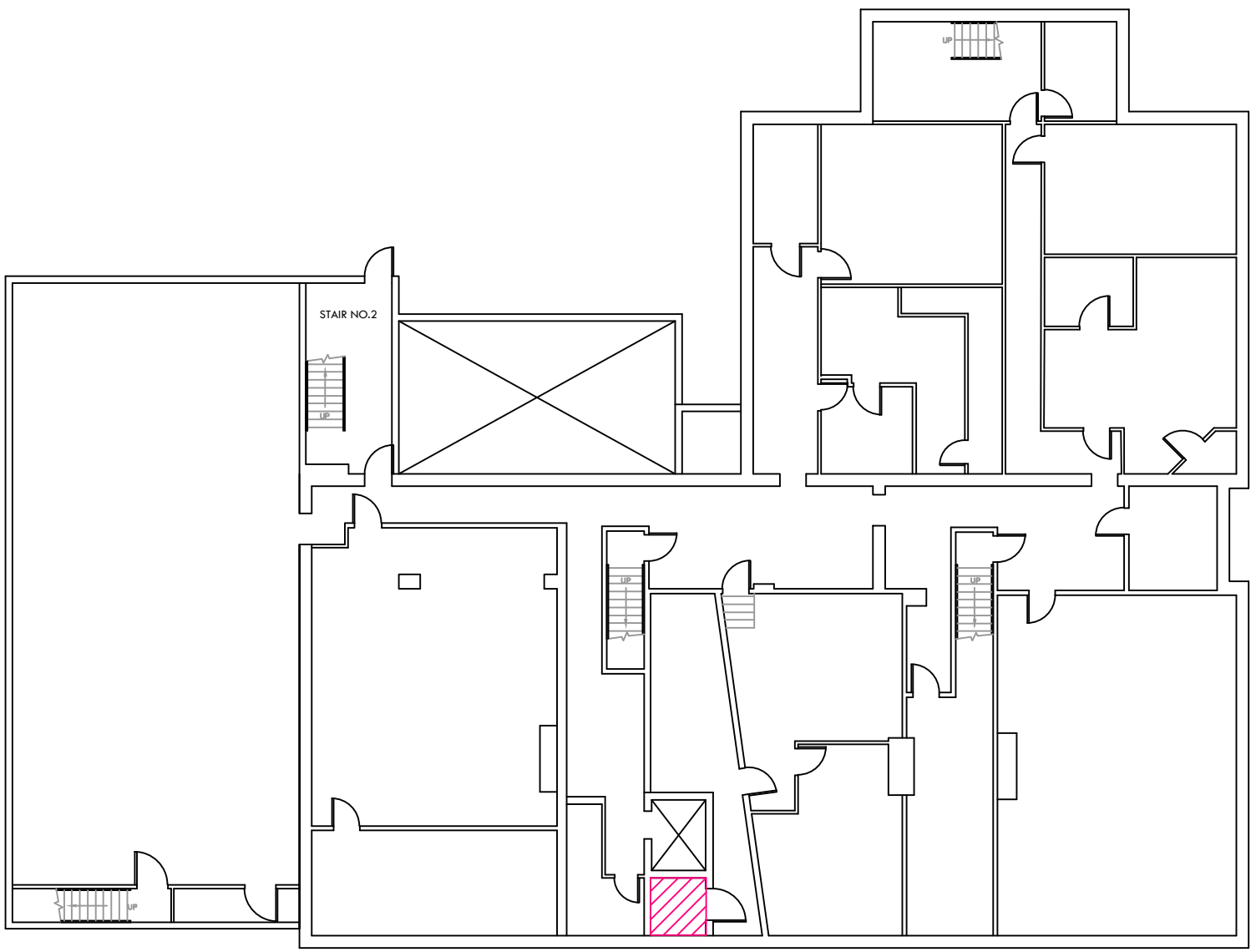
Drawing No: 2.3

Scale: NTS

Drawn By: AB

Approved By: MZ

CONSULTANTS
Occupational Hygiene & Engineering



Legend:

Mechanical Systems Insulation (MSI)

Asbestos-Containing Paper Material is Present Above the Metal Deck in the Elevator Shaft.

Notes:
Locations of site features are approximate and may vary from that shown

Drawing Title:

Friable Asbestos-Containing Materials

Client Address:

City of Peterborough
500 George St. N.
Peterborough, ON

Project Location:

Queen Alexandra Community Centre
Basement
180 Barnardo Ave.
Peterborough, ON

Project No: 31856

N

Date: Jan 2025

Scale: NTS

Drawn By: AB

Approved By: MZ

Drawing No:

3.1

CONSULTANTS
Occupational Hygiene & Engineering

APPENDIX B RESULTS

Table B.1

Summary of Bulk Sample Analysis Results for the Presence of Asbestos by Polarized Light Microscopy (PLM) with Dispersion Staining

Collected on January 19, 2026

OHE Sample Number	Sample Description	Sample Location	Analysis Results (% and Type of Asbestos)
31856-1A	Vinyl Floor Tiles (VFTs), 12”x12”, Beige with brown streaks with adhesive	Top layer, Elevator Floor	None Detected
31856-1B	VFTs, 12”x12”, Beige with brown streaks with adhesive	Top layer, Elevator Floor	None Detected
31856-1C	VFTs, 12”x12”, Beige with brown streaks with adhesive	Top layer, Elevator Floor	None Detected
31856-2A	VFTs with adhesive	Bottom layer, Elevator Floor	None Detected
31856-2B	VFTs with adhesive	Bottom layer, Elevator Floor	None Detected
31856-2C	VFTs with adhesive	Bottom layer, Elevator Floor	None Detected
31856-3A	Mortar	Gaps between the blocks, North section of the west wall, Minor FB Storage 011, Basement	None Detected
31856-3B	Mortar	Gaps between the blocks, North section of the west wall, Minor FB Storage 011, Basement	None Detected
31856-3C	Mortar	Gaps between the blocks, East section of the north wall, Minor FB Storage 011, Basement	None Detected
31856-4A	Mortar	Gaps between the blocks, East wall, Elevator room 012, Basement	None Detected
31856-4B	Mortar	Gaps between the blocks, East wall, Elevator room 012, Basement	None Detected
31856-4C	Mortar	Gaps between the blocks, South wall, Elevator room 012, Basement	None Detected
31856-5A	Mortar	Gaps between the bricks, North wall, Elevator room 012, Basement	None Detected

OHE Sample Number	Sample Description	Sample Location	Analysis Results (% and Type of Asbestos)
31856-5B	Mortar	Gaps between the bricks, North wall, Elevator room 012, Basement	None Detected
31856-5C	Mortar	Gaps between the bricks, North wall, Elevator room 012, Basement	None Detected
31856-6A	Cementitious material, Dark grey	Gaps between the north wall and the east wall, Elevator room 012, Basement	None Detected
31856-6B	Cementitious material, Dark grey	Gaps between the north wall and the east wall, Elevator room 012, Basement	None Detected
31856-6C	Cementitious material, Dark grey	Gaps between the north wall and the east wall, Elevator room 012, Basement	None Detected
31856-7A	Cementitious material, Light grey	Gaps around pipe penetration, East wall, Elevator room 012, Basement	None Detected
31856-7B	Cementitious material, Light grey	Gaps between the door frame and the south wall, Elevator room 012, Basement	None Detected
31856-7C	Cementitious material, Light grey	Sealing an opening, East wall, Elevator room 012, Basement	None Detected
31856-8A	Drywall Joint Compound (DJC)	Ceiling, Elevator room 012, Basement	None Detected
31856-8B	DJC	Ceiling, Elevator room 012, Basement	None Detected
31856-8C	DJC	Ceiling, Elevator room 012, Basement	None Detected
31856-9A	Mortar	Gaps between the stones, West wall, Elevator room 012, Basement	None Detected
31856-9B	Mortar	Gaps between the stones, West wall, Elevator room 012, Basement	None Detected
31856-9C	Mortar	Gaps between the stones, West wall, Elevator room 012, Basement	None Detected
31856-10A	Block wall primer	Around the elevator door, South wall, Corridor C02	None Detected
31856-10B	Block wall primer	Around the elevator door, South wall, Corridor C02	None Detected
31856-10C	Block wall primer	Around the elevator door, South wall, Corridor C02	None Detected
31856-11A	Mortar	Gaps between the blocks, South wall, Corridor C02	None Detected
31856-11B	Mortar	Gaps between the blocks, South wall, Corridor C02	None Detected
31856-11C	Mortar	Gaps between the blocks, South wall, Corridor C02	None Detected
31856-12A	DJC	South wall by the elevator door, Corridor C04, Main floor	None Detected

OHE Sample Number	Sample Description	Sample Location	Analysis Results (% and Type of Asbestos)
31856-12B	DJC	North section of the east wall, Corridor C04, Main floor	None Detected
31856-12C	DJC	South section of the east wall, Corridor C04, Main floor	None Detected
31856-13A	DJC	South wall by the elevator, Corridor C03, Second floor	None Detected
31856-13B	DJC	South wall by the elevator, Corridor C03, Second floor	None Detected
31856-13C	DJC	South wall by the elevator, Corridor C03, Second floor	None Detected

Table B.2

Summary of Bulk Samples Analysis Results for the Presence of Lead by X-Ray Fluorescence (XRF)

Tested on January 19, 2026

OHE Sample Number	Sample Description	Sample Location	Lead Concentration mg/cm^2
31856-L1	**Orange paint**	**Fire door from Minor Football Storage 009 to Minor FB Storage 011, Basement**	**14**
31856-L2	Beige paint	Fire door frame from Minor Football Storage 009 to Minor FB Storage 011, Basement	No
31856-L3	Beige paint	Door to Elevator Room 012 from Minor FB Storage 011, Basement	No
31856-L4	Light brown paint	Door frame to Elevator Room 012 from Minor FB Storage 011, Basement	No
31856-L5	**Beige paint**	**North wall, Elevator Room 012, Basement**	**0.06**
31856-L6	**Grey paint**	**North wall, Elevator Room 012, Basement**	**0.07**
31856-L7	Green paint	Metal cover of elevator machine, Elevator Room 012, Basement	No
31856-L8	**Grey paint**	**Floor, Elevator Room 012, Basement**	**0.06**
31856-L9	**White paint**	**South concrete wall, Minor FB Storage 011, Basement**	**0.06**
31856-L10	**Black paint**	**Metal beam, Under the ceiling, Minor FB Storage 011, Basement**	**0.09**
31856-L11	**Green paint**	**North wall, Minor Football Storage 009, Basement**	**0.08**
31856-L12	**Dark green paint**	**Door to Corridor C03 from Minor Football Storage 009, Basement**	**11**
31856-L13	**Red paint**	**Door to Minor Football Storage 009 from Corridor C03, Basement**	**13.3**

OHE Sample Number	Sample Description	Sample Location	Lead Concentration mg/cm^2
31856-L14	**Dark brown paint**	**Door to Minor Football Storage 009 from Corridor C03, Basement**	**11.5**
31856-L15	**Cream paint**	**West wall, Corridor C03, Basement**	**0.06**
31856-L16	**Cream paint**	**South wall, Washroom 018, Basement**	**0.07**
31856-L17	**Cream paint**	**South wall by the elevator door, Corridor C02**	**0.06**
31856-L18	Sky blue paint	South wall by the elevator door, Corridor C04, Main floor	No
31856-L19	Cream paint	South wall by the elevator door, Corridor C03, Second floor	No

Note: Classification of lead results is based on the actual XRF readings. Positive results are expressed as the actual concentration of the lead in the paint. Negative results are expressed as “No” and are indicative of lead concentration below the limit of detection of the XRF.

APPENDIX C LABORATORY ANALYSIS REPORT

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Laboratory Analysis Report

To:

Fred Atrash
OHE Consultants Inc.
311 Matheson Boulevard East
Mississauga, Ontario
L4Z 1X8

EMC LAB REPORT NUMBER: A129570r*
Job/Project Name:
Analysis Method: Polarized Light Microscopy – EPA 600
Date Received: Jan 20/26 **Date Analyzed:** Jan 20/26
Analyst: Fabio Anunciacao
Reviewed By: Chengming Li

No. of Phases Analyzed: 45
Job No: 31856
Number of Samples: 39
Date Reported: Jan 21/26

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
31856-1A	A129570-1	Vinyl Floor Tiles (VFTs), 12"x12", Beige with brown streaks with adhesive/Top layer, Elevator Floor	2 Phases: a) Beige, vinyl floor tile b) Yellow, mastic	 **ND** **ND**			 100 100
31856-1B	A129570-2	VFTs, 12"x12", Beige with brown streaks with adhesive/Top layer, Elevator Floor	2 Phases: a) Beige, vinyl floor tile b) Yellow, mastic	 **ND** **ND**			 100 100
31856-1C	A129570-3	VFTs, 12"x12", Beige with brown streaks with adhesive/Top layer, Elevator Floor	2 Phases: a) Beige, vinyl floor tile b) Yellow, mastic	 **ND** **ND**			 100 100
31856-2A	A129570-4	VFTs with adhesive/Bottom layer, Elevator Floor	2 Phases: a) Beige, vinyl floor tile b) Yellow, mastic	 **ND** **ND**			 100 100
31856-2B	A129570-5	VFTs with adhesive/Bottom layer, Elevator Floor	2 Phases: a) Beige, vinyl floor tile b) Yellow, mastic	 **ND** **ND**			 100 100
31856-2C	A129570-6	VFTs with adhesive/Bottom layer, Elevator Floor	2 Phases: a) Beige, vinyl floor tile b) Yellow, mastic	 **ND** **ND**			 100 100
31856-3A	A129570-7	Mortar/Gaps between the blocks, North section of the west wall, Minor FB Storage 011, Basement	Grey, cementitious material	**ND**			100
31856-3B	A129570-8	Mortar/Gaps between the blocks, North section of the west wall, Minor FB Storage 011, Basement	Grey, cementitious material	**ND**			100

EMC LAB REPORT NUMBER: A129570r
Client's Job/Project Name/No.: 31856
Analyst: Fabio Anunciacao

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
31856-3C	A129570-9	Mortar/Gaps between the blocks, East section of the north wall, Minor FB Storage 011, Basement	Grey, cementitious material	**ND**			100
31856-4A	A129570-10	Mortar/Gaps between the blocks, East wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-4B	A129570-11	Mortar/Gaps between the blocks, East wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-4C	A129570-12	Mortar/Gaps between the blocks, South wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-5A	A129570-13	Mortar/Gaps between the bricks, North wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-5B	A129570-14	Mortar/Gaps between the bricks, North wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-5C	A129570-15	Mortar/Gaps between the bricks, North wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-6A	A129570-16	Cementitious material, Dark grey/Gaps between the north wall and the east wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-6B	A129570-17	Cementitious material, Dark	Grey, cementitious material	**ND**			100

EMC LAB REPORT NUMBER: A129570r
Client's Job/Project Name/No.: 31856
Analyst: Fabio Anunciacao

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
		grey/Gaps between the north wall and the east wall, Elevator room 012, Basement					
31856-6C	A129570-18	Cementitious material, Dark grey/Gaps between the north wall and the east wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-7A	A129570-19	Cementitious material, Light grey/Gaps around pipe penetration, East wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-7B	A129570-20	Cementitious material, Light grey/Gaps between the door frame and the south wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-7C	A129570-21	Cementitious material, Light grey/Sealing an opening, East wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-8A	A129570-22	Drywall Joint Compound (DJC)/Ceiling, Elevator room 012, Basement	White, joint compound	**ND**			100
31856-8B	A129570-23	DJC/Ceiling, Elevator room 012, Basement	White, joint compound	**ND**			100
31856-8C	A129570-24	DJC/Ceiling, Elevator room 012, Basement	White, joint compound	**ND**			100
31856-9A	A129570-25	Mortar/Gaps between the stones,	Grey, cementitious material	**ND**			100

EMC LAB REPORT NUMBER: A129570r
Client's Job/Project Name/No.: 31856
Analyst: Fabio Anunciacao

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
		West wall, Elevator room 012, Basement					
31856-9B	A129570-26	Mortar/Gaps between the stones, West wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-9C	A129570-27	Mortar/Gaps between the stones, West wall, Elevator room 012, Basement	Grey, cementitious material	**ND**			100
31856-10A	A129570-28	Block wall primer/Around the elevator door, South wall, Corridor C02	White, primer	**ND**			100
31856-10B	A129570-29	Block wall primer/Around the elevator door, South wall, Corridor C02	White, primer	**ND**			100
31856-10C	A129570-30	Block wall primer/Around the elevator door, South wall, Corridor C02	White, primer	**ND**			100
31856-11A	A129570-31	Mortar/Gaps between the blocks, South wall, Corridor C02	Grey, cementitious material	**ND**			100
31856-11B	A129570-32	Mortar/Gaps between the blocks, South wall, Corridor C02	Grey, cementitious material	**ND**			100
31856-11C	A129570-33	Mortar/Gaps between the blocks, South wall, Corridor C02	Grey, cementitious material	**ND**			100
31856-12A	A129570-34	DJC/South wall by the elevator door, Corridor C04, Main floor	White, joint compound	**ND**			100
31856-12B	A129570-35	DJC/North section of the east wall,	White, joint compound	**ND**			100

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Laboratory Analysis Report

EMC LAB REPORT NUMBER: A129570r
Client's Job/Project Name/No.: 31856
Analyst: Fabio Anunciacao

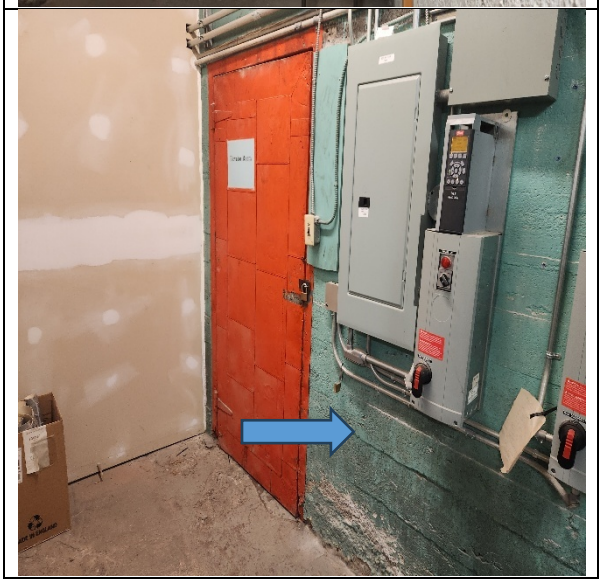
Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
		Corridor C04, Main floor					
31856-12C	A129570-36	DJC/South section of the east wall, Corridor C04, Main floor	White, joint compound	**ND**			100
31856-13A	A129570-37	DJC/South wall by the elevator, Corridor C03, Second floor	White, joint compound	**ND**			100
31856-13B	A129570-38	DJC/South wall by the elevator, Corridor C03, Second floor	White, joint compound	**ND**			100
31856-13C	A129570-39	DJC/South wall by the elevator, Corridor C03, Second floor	White, joint compound	**ND**			100

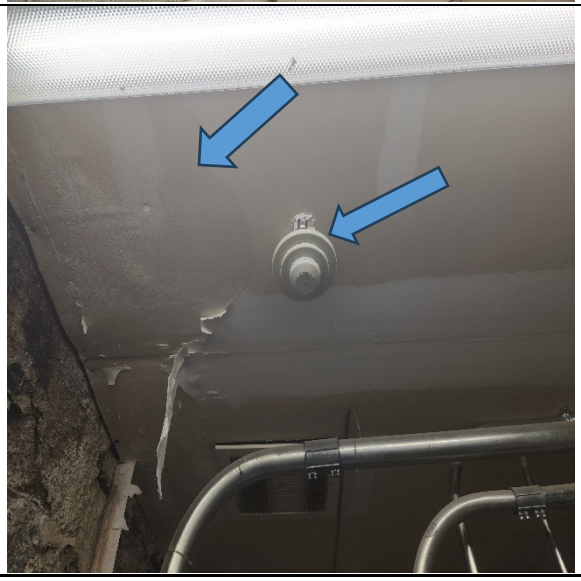
Note:
1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.
5. Vinyl floor tiles may contain very fine asbestos fibres which the PLM method cannot detect. TEM analysis may be necessary to confirm the absence of asbestos.

* This report has been revised as requested on January 21, 2026.

APPENDIC D SITE PHOTOGRAPHS

Photograph 1: View of the asbestos-containing mechanical systems insulation in the form of parging cement observed above the drywall ceiling in the Elevator Room 012 at the Subject Location.	
Photograph 2: View of the asbestos-containing paper material identified above the metal deck of the elevator shaft at the Subject Location.	
Photograph 3: View of the lead-containing orange paint identified on the door leading to Minor FB Storage 011 from Minor Football Storage 009 at the Subject Location.	

Photograph 4: View of the lead-containing beige paint identified on the north wall in the elevator room 012 in the basement at the Subject Location.	
Photograph 5: View of the lead-containing white paint identified on the south wall in Minor FB Storage 011 in the basement at the Subject Location.	
Photograph 6: View of the lead-containing green paint identified on the north wall in Minor FB Storage 009 in the basement at the Subject Location.	

Photograph 7: View of the lead-containing dark green paint identified on the fire door leading to Corridor C03 from Minor Football Storage 009 in the basement at the Subject Location.	
Photograph 8: View of the lead-containing cream paint identified on the south wall by the elevator in Corridor C02 in the basement at the Subject Location.	
Photograph 9: View of the smoke detector and the water damage (staining) observed on the ceiling in the elevator room 012 in the basement at the Subject Location.	

APPENDIX E BACKGROUND INFORMATION ON HAZARDOUS BUILDING MATERIALS

Asbestos

Asbestos is a term applied to a family of fibrous minerals divided into two geological groups, serpentine and amphibole. These minerals are naturally occurring and are found in every mountain formation throughout the world. Only six forms of asbestos were used commercially. These are chrysotile, the only serpentine asbestos type, and amosite, crocidolite, anthophyllite, tremolite and actinolite which are the amphibole asbestos type.

There are over 3,000 separate uses of asbestos identified in existing literature. Uses are dependent upon the physical and chemical properties of a particular asbestos type. The desirable properties of asbestos fibres differ with each type of asbestos and include:

Fire retardance	Resistance to acids and alkalies	High tensile strength
Filter action	Thermal insulating qualities	Friction and wear resistance
Cohesion	Reinforcement	Filler

Asbestos is rarely found in pure form in a product and all products are divided into two broad categories: "friable materials" and "non-friable materials or manufactured products". "Friable materials" are defined as materials that, when dry, can be crumbled, pulverized or powdered by hand pressure. This classification includes materials such as sprayed fireproofing, thermal insulation applications, acoustical texturized material and refractory or non-friable materials that have been made to become friable through degradation.

"Non-friable materials" are generally hard and do not readily release fibres. Most asbestos-containing materials (ACMs) are found in this category and are typically included in materials such as cement products, felts, cloths, floor and roof coverings, friction products and ceiling tiles.

Asbestos fibres, when inhaled, may cause various respiratory diseases primarily including Asbestosis, Mesothelioma and Lung Cancer which all can cause an early death. Based on the health effects of exposure to asbestos fibres, the use of asbestos has become regulated across Canada and some products are now prohibited. Essentially, the location of ACMs must be identified and a written report kept and maintained of the ACMs locations so that work undertaken on these materials is conducted in a safe manner and any damaged ACMs or debris is repaired or removed.

Acrylonitrile

Acrylonitrile is explosive, flammable and toxic, found as a colourless or yellow clear liquid. It is used to produce a variety of products including plastics, adhesives, gaskets, seals and hoses. Health effects resulting in acute exposure to acrylonitrile vary from minor symptoms such as eye irritation, itching skin, blisters, headaches, sneezing and vomiting with chronic exposures potentially causing cancers of the stomach, lymph system and brain.

Arsenic

The common form of arsenic is grey in colour with a metallic appearance. Arsenic has been used in the manufacturing of glass to eliminate the green colour resulting from the impurities of iron compounds. It was also used in the productions of poisons. Arsenic is poisonous in doses significantly larger than 65 mg (1 grain), and poisoning can arise from a single large dose or from repeated small doses.

Benzene

Benzene is an aromatic organic hydrocarbon existing either as a clear liquid or a vapour. Benzene is a highly flammable and volatile material and was primarily a by-product in petroleum refineries. However, it has also been commonly used to produce styrene, synthetic rubbers, plastics, resins and solvents.

Serious health effects can occur from exposure to benzene, mainly as a result of inhalation of vapours and mists. Ingestion by swallowing and absorption through the skin are also possible routes of exposure. Health effects can result from ingesting food or drink contaminated with benzene. Symptoms can range from irritated eyes, red blistering skin, headaches, nausea and drowsiness. Benzene exposure can also induce blood and bone marrow toxicity.

Coke Oven Emissions

Coke oven emissions can be either in a condensed form as a brownish thick liquid, or uncondensed form as a vapour. Coke oven emissions are a mixture of coal tar, coal tar pitch, and creosote and contain chemicals such as benzo(a)pyrene, benzanthracene, chrysene, and phenanthrene.

Chronic (long-term) exposure to coke oven emissions in humans results in conjunctivitis, severe dermatitis, and lesions of the respiratory and digestive systems.

Epidemiologic studies of coke oven workers have reported an increase in cancer of the lung, trachea, bronchus, kidney, prostate, and other sites.

Ethylene Oxide

Sources of ethylene oxide emissions into the air include uncontrolled emissions or venting with other gases in industrial settings. Other sources of ethylene oxide air emissions include automobile exhaust and its release from commodity-fumigated materials. Individuals may be exposed to ethylene oxide through breathing contaminated air, from smoking tobacco or being in the proximity to someone who is smoking.

Ethylene Oxide has been linked to reproductive and tissue damage and to have teratogenic effects, cytogenetic damage and neurological effects.

Isocyanates

Isocyanates are compounds that contain a group of atoms consisting of Nitrogen (N), Carbon (C), and Oxygen (O), which make isocyanates very useful in the manufacturing industry. Isocyanates are commonly used in the production of plastics, foams, and coatings.

Exposure to isocyanates can be through inhalation of vapour, mist or dust, or by direct contact.

Health effects associated with exposure to isocyanates include: decreased lung function, cold and flu-like symptoms, fever and shortness of breath.

Lead

For thousands of years lead has been used industrially because of its poor conductive property. Lead has been commonly used for electric storage batteries, pigments, paints, and rubber compounds.

Health effects associated with lead exposure can result in damage to the kidneys, gastrointestinal system, nervous system and reproductive system. Symptoms range from vomiting, and abdominal cramps to pains in joints and muscles.

Ozone Depleting Substances

The main source of ozone depleting substances is in the form of man-made halocarbon refrigerants (chlorofluorocarbon (CFCs), freons and halons). CFCs and other contributory substances are referred to as ozone-depleting substances (ODS). Since the ozone layer of the earth prevents most harmful ultraviolet light from passing through the Earth's atmosphere, these ozone depleting substances require proper disposal and limit its release into the atmosphere. The main health concern regarding ODS are the effects of increased surface UV radiation on human health.

Mercury

At room temperature mercury is in the form of a silver coloured liquid. Mercury can exist in three forms: elemental (the pure form) organic or inorganic.

Mercury can be absorbed into the body by inhalation, ingestion or absorption through the skin. As a health hazard mercury can affect the respiratory system resulting in coughing and chest pains. Mercury poisoning can also cause kidney damage, skin irritation and may even harm the nervous system.

Mould and Animal Droppings

Mould is a colloquial term used to define large and taxonomically diverse number of fungal species where their growth results in a “mouldy” appearance on porous building materials (i.e. gypsum wallboard, wood, suspended ceiling tiles, etc.). Essentially, the building materials become discoloured by a layer of fungal growth.

Mould is a fungus that grows in the form of multicellular filaments called hyphae. A connected network of hyphae, called a mycelium, is considered a single organism. Mould reproduces via spores and the formation and shape of these spores is traditionally used to classify the mould into its respective genus. In order for mould to grow it requires two things: a food source (i.e. gypsum wallboard, ceiling tiles, etc.) and water.

Mould is ubiquitous in nature and is required to breakdown detritus in nature; hence, mould spores are a common component of outdoor and indoor air. Although mould spores can be found in both indoor and outdoor air, mould growth on buildings materials is a concern. First, it can degrade the building materials and second, it can lead to a variety of health problems. General symptoms caused by mould are allergenic reactions such as watery, itchy eyes, cough, headaches or migraines, difficulty

breathing, rashes, tiredness, sinus problems, nasal blockage and frequent sneezing. Various practices can be followed to mitigate mould issues in buildings, the most important of which is to remedy any water intrusion issues in a building as it facilitates the growth of mould. Removal of the affected building materials and repair of the source of water intrusion is required in buildings. Once the affected buildings have been removed the source of the allergenic reactions are reduced and/or eliminated.

Animal droppings within a building are a sign of an infestation problem that needs to be addressed. Workers removing accumulations of animal droppings are at risk of exposure to airborne mould spores and other microbial hazards, if the material is disturbed. Many of these microorganisms are known to cause respiratory infections in workers exposed during construction or maintenance disturbance. Therefore, appropriate measures should be taken when cleaning animal droppings.

PCBs

PCBs were widely used as dielectric and coolant fluids, for example in transformers, capacitors, and electric motors. Due to PCBs environmental toxicity and classification as a persistent organic pollutant, PCB production has been banned. According to the U.S. Environmental Protection Agency (EPA), PCBs have been shown to cause cancer in animals, and there is also evidence that they can cause cancer in humans. Concerns about the toxicity of PCBs are largely based on compounds within this group that share a structural similarity and toxic mode of action with dioxin. Toxic effects such as endocrine disruption and neurotoxicity are also associated with other compounds within the group.

Silica

Silica can be found naturally in two forms, crystalline or amorphous material. Crystalline silica is regulated due to its significant toxicity over the amorphous silica. The three most common forms of crystalline silica in the workplace are: quartz, cristobalite and tridymite. The physical properties of silica make it a valuable substance for use in a variety of different industries and processes such as an abrasive and scouring compound, fillers for paint and mastic and optical equipment. Health effects resulting from exposure to crystalline silica range from eye and skin irritation, coughing and sneezing to silicosis, a progressive lung disease.

Radioactive Materials

The main location of radioactive materials in a building is usually found in smoke detectors. Most smoke detectors, which operate alarms, contain an artificially produced radioisotope called Americium-241.
Smoke detectors/alarms are important safety devices, because of their obvious potential to save lives and property.

There are two types of smoke detectors commonly available, one type uses the radiation from a small amount of radioactive material to detect the presence of smoke or heat sources and the other type of detector does not contain radioactive material (this type is more expensive and is less effective in some circumstances).

The radiation dose to the occupants of a building from a smoke detector is essentially zero, and less than that from natural background radiation. However, the proper handling and disposal of these materials is required to ensure the safety of occupants and workers. In Canada, the handling, storage, management and disposal of smoke detectors that operate using a radioactive substance is regulated under Federal law.

Vinyl Chloride

Vinyl chloride is required in the manufacture of polyvinyl chloride (PVC) and at room temperature is present as a colourless, flammable gas. Vinyl chloride is also known as chloroethene, chloroethylene, and ethylene monochloride, and can result from the breakdown of other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene.

Common exposure is a result of inhaling vinyl chloride from industrial leaks, hazardous waste sites and landfills. Symptoms of breathing vinyl chloride are sleepiness, dizziness or laboured breathing. Chronic exposure can cause liver and nerve damage or cancer.

APPENDIX F SUMMARY OF APPLICABLE REGULATIONS AND GUIDELINES

APPLICABLE REGULATIONS AND GUIDELINES

The following is a list of applicable regulations and guidelines:

Designated Substances

A Designated Substances report is completed to fulfil the Owner's requirements under Section 30 of the Ontario Occupational Health and Safety Act. A copy of the report must be provided to the general contractor who in turn must submit the report to all subcontractors prior to the commencement of demolition, construction or renovations.

Ontario Regulation 490/09 “Designated Substances” (O. Reg. 490/09) provides guidance on exposure monitoring, permissible exposure levels, medical monitoring, etc. for all Designated Substances in an industrial setting. There are no specific Ministry of Labour (MOL) regulations for control of the Designated Substances, with the exception of asbestos, on construction projects; however, the MOL actively enforces the general duty clause of the OHSA to take all reasonable precautions in the circumstances of protection of a worker. It is important to note that Ontario Regulation 213/91 “Construction Projects” (O. Reg. 213/91) applies to construction projects and provides instruction on general requirements, safe work practices, reporting, etc.

Asbestos

Three regulations govern the control, handling, transport and disposal of asbestos in Ontario:

- Ontario Regulation 278/05 “Asbestos on Construction Projects and in Buildings and Repair Operations” made under OHSA (O. Reg. 278/05);
- Ontario Regulation 347/90 “General – Waste Management” (as amended) made under the Environmental Protection Act (O. Reg. 347/90); and
- The regulations respecting “The Handling and Offering for Transport and Transporting of Dangerous Goods”.

Ontario Regulation 278/05

Ontario Regulation 278/05 applies to buildings with regards to maintenance, renovations or demolition work where Asbestos-Containing Materials (ACMs) are or may be disturbed.

Under O. Reg. 278/05 a building owner must instate an Asbestos Management Program (AMP) for the building. The major requirements for the AMP including the following:

- Preparation and maintenance of a record of the location of asbestos-containing materials in the building;
- Notification of the building's tenants of the location of such material;
- Establishment of a training program for those employees of the owner who may work in close proximity to and disturb the material;
- Periodic inspection of the material to determine its condition;
- Remedial action on material that has deteriorated following the precautions and procedures prescribed by the regulation as Type 1, Type 2 and Type 3; and
- Removal of asbestos-containing materials to the extent practicable prior to demolition of a building or part thereof.

The regulation prescribes work to be conducted according to three procedure types. The procedure to be followed depends on the type of material and the regulation provides instruction on how the work must be performed.

Ontario Regulation 347/90

Ontario Regulation 347/90 applies to the disposal of all hazardous materials, including asbestos waste, from the location of generation to a landfill site. The regulation also prescribes procedures on how the asbestos waste is to be buried at the landfill site.

The major requirements to the building owner are to ensure that:

- The waste is appropriately packaged and labelled;
- The transport vehicle has an appropriate placard;
- The asbestos waste is transported on the same day as received by the landfill site; and
- The route of travel is the most direct.

The building owners are held responsible for their asbestos waste as prescribed in the regulation until it is accepted by the waste disposal site.

The regulations respecting the Handling and Offering for Transport and Transporting of Dangerous Goods

These regulations govern the packaging mode of transport labelling, placards and documentation of waste while in transport. The labelling requirements differ from O. Reg. 347/90.

The major requirement to the building owner is to ensure the waste meets the packaging requirements and that a bill of lading accompanies the shipment.

Lead

As stated previously there are no specific regulations regarding lead on construction projects; however, the MOL published a guideline entitled “Lead on Construction Projects” to raise the awareness of employers and workers to the hazards posed by lead in construction and the measures and procedures that should be taken to control those hazards.

The document provides information on the following:

- Health effects associated with lead exposure;
- Methods for controlling the lead hazard;
- Classification of work; and
- Measure and procedures for working with lead.

The guideline classifies operations involving lead-containing materials into three groups, Type 1, Type 2 and Type 3 operations. The procedure to be followed depends on the anticipated airborne concentration of lead generated during the operation, which is dependent on the type of work performed. The guideline also provides instruction on how the work must be performed.

Silica

Again, there are no specific regulations regarding silica on construction projects; however, the MOL published a guideline entitled “Silica on Construction Projects” to raise the awareness of employers and workers to the hazards posed by silica in construction and the measures and procedures that should be taken to control those hazards.

- Health effects associated with silica exposure;

- Methods for controlling the silica hazard;
- Classification of work; and
- Measure and procedures for working with silica.

The guideline classifies operations involving silica-containing materials into three groups, Type 1, Type 2 and Type 3 operations. The procedure to be followed depends on the anticipated airborne concentration of silica generated during the operation, which is dependent on the type of work performed. The guideline also provides instruction on how the work must be performed.

Polychlorinated Biphenyls (PCBs)

The federal PCB Regulations, SOR/2008-273, regulates the use, handling, storage, management and release of PCBs and any product containing PCBs. The purpose of the regulation is to also accelerate the elimination of these substances by setting deadlines to end the use of PCBs and products containing PCBs and sending them for destruction.

Ontario Regulation 362/90 “Waste Management-PCBs” made under the Environmental Protection Act (O. Reg. 362/90) controls the waste management and transfer of PCBs. Under O. Reg. 362/90 a PCB material is defined as a material containing a PCB concentration of 50 parts per million (ppm) by weight.

Ozone Depleting Substances

The federal Ozone Depleting Substances Regulations SOR/99-7 (as amended), regulates the import, export, manufacture, use and sale of ozone depleting substances (e.g. chlorofluorocarbons, halons, etc.) in Canada.

In addition, the federal Halocarbon Regulations SOR/2003-289 (as amended), governs the release, recovery and recycling of ozone depleting substances and their halocarbon alternatives in refrigeration and air conditioning equipment in Canada.

Lastly, Ontario Regulation 463/10 made under the Environmental Protection Act regulates the disposal, transport and transfer of ozone depleting substances and halocarbons and refrigerants in Ontario.

Mould and Water Damaged Building Materials

Currently, there are no Canadian regulations that govern the presence of mould and water damaged materials in the workplace environment. However, the Health Canada document “Fungal Contamination in Public Buildings: Health Effects and Investigation Methodology” (2004) concludes that current knowledge supports the need to prevent damp conditions and mould growth and to remediate mould growth and clean mould contamination in buildings. Therefore, the presence of mould growth, mould contaminated materials and/or water damaged materials in the occupied environment is interpreted as a failure of Health Canada guidelines and as such requires remedial action.

In addition, the MOL has issued a document titled “Alert: Mould in Workplace Buildings”. This document explains the MOL’s position with respect to the presence of mould growth in workplace buildings. Essentially, there is a responsibility to ensure the health and safety of workers. This includes protecting workers from biological hazards in workplace buildings. Various sections of the Industrial, Construction, Mining or Health Care regulations may also apply to maintenance and remediation activities.

The Canadian Construction Association (CCA) document CCA 82 - 2004 “Mould Guidelines for the Canadian Construction Industry” (CCA 82/04) provides guidelines for the assessment and remediation of mould in indoor environments.

Aboveground and Underground Storage Tanks

The regulatory framework for storage tanks is as follows:

- Technical Standards and Safety Act
- Ontario Regulation 217/01: Liquid Fuels
- Liquid Fuels Handling Code 2017
- CSA B139-15 Installation Code for Oil Burning Equipment

CSA B139-15 holds strength as a regulation through a Technical Standards & Safety Authority adoption document making it part of the Liquid Fuels Handling Code 2017. The Liquid Fuels Handling Code 2017 was made part of Ontario Regulation 217/01 by way of a Technical Standards & Safety Authority adoption document.

Radioactive Materials

In Canada, all nuclear facilities and activities are governed by the Nuclear Safety and Control Act and associated regulations.

The federal Nuclear Substances and Radiation Devices Regulations, SOR/2000-207, regulates the use, handling, storage, management and disposal of smoke detectors that operate using a radioactive substance.

APPENDIX G METHODOLOGIES

GENERAL SURVEY METHODOLOGY

The survey consisted of an extensive examination of accessible areas of the building to identify hazardous building materials. Suspected hazardous building materials were assessed based on the surveyor's knowledge regarding the historical use of hazardous building materials in buildings, through published data and through previous experiences.

Accessible is defined as an area above a suspended ceiling tile, within an access hatch or behind a closed door, not impeded by any structure, article or thing. An area enclosed by cement block, plaster, solid lumber, etc., where minor demolition is required to gain entry is considered non-accessible. The walkthrough survey was augmented with layout drawings where available.

OHE's surveyors completed a Room by Room sheet which details the findings in each room entered. The Room by Room sheet details the room number and/or room description including the materials observed in the room and the condition of the material. The Room by Room sheet also records sampling information, quantity of the material(s), accessibility of the material(s) and the recommended control action.

OHE's approach to the work followed accepted industry procedures as well as our own in-house protocols. The examination of materials was largely performed visually with some occasion where physical contact was necessary to assess the condition or examine for underlying layers.

ASBESTOS SURVEY METHODOLOGY

This following information summarizes the bulk sampling methodology, analysis methodology and the methodology used for the assessment of the condition of Asbestos-Containing Materials (ACMs).

Bulk Sampling Methodology

Bulk samples were collected for subsequent analysis during the building survey. A small volume of material (approximately one teaspoon full) was removed either from a damaged section of suspect material or cut out of intact material and then temporarily repaired by sealing with tape to prevent fibre release. Tools used in sample collection were washed after each use to prevent cross-contamination. Collected samples were placed in sealed plastic bags and shipped to an independent laboratory for analysis.

Bulk Sample Analysis Methodology

Bulk samples of suspect ACMs were analyzed in accordance with a US EPA method for the determination of asbestos content in bulk materials, EPA Method 600/R-93/116 as per requirements of O. Reg. 278 which specifies this method be used to establish whether a material is considered to be an ACM (i.e., contains ≥0.5% asbestos by dry weight) and for establishing its asbestos content and the type of asbestos.

The EPA Method requires that the samples be analyzed using the Polarized Light Microscopy (PLM) technique. The percentage of asbestos in the sample is measured as perceived by the analyst in comparison to standard area projections and is greatly influenced by the analyst's experience. The method is useful for the qualitative identification of asbestos (type) and the semi-quantitative (% estimates) determination of asbestos content in bulk samples.

The asbestos bulk samples were analyzed by an independent and NVLAP accredited laboratory. To ensure quality results, the independent laboratory chosen must successfully participate in an "Asbestos Proficiency Analytical Testing Program" and as such, this laboratory is responsible for their findings.

ASSESSMENT OF ACMs METHODOLOGY

The assessment of ACMs involves the evaluation of a number of factors by the surveyor including:

- Asbestos content
- Condition of the material
- Accessibility
- Water damage
- Activity and vibration
- Presence in air plenum/direct air stream

Where ACMs are found to be in good condition, firmly bound and not likely to deteriorate or fall, the recommended procedure is to evaluate the condition of the material on a periodic basis (which should be at least once every twelve-month period as required by O. Reg. 278/05 unless specified more frequently) in order to detect gradual deterioration. This process is referred to as an "Operation and Maintenance Program".

Damaged material is identified by surface crumbling, blistering, water stains, gouges, marring or being otherwise abraded. The accumulation of powder dust or debris similar in appearance to the suspect material can be used as confirmatory evidence.

In situations where the ACMs are found to have deteriorated or likely to fall, the following are the four abatement options that may be specified in this report:

Cleaning

The cleaning of asbestos-containing debris may be performed using a High Efficiency Particulate Air (HEPA) filter vacuum cleaner or by damp wiping techniques. All fallen asbestos material must be cleaned upon discovery. In situations where the material will continue to fall due to deterioration, damage or abrasion, additional corrective work is required, i.e., the material must be repaired, permanently enclosed or removed.

Repairs

This option is usually selected in situations where damage to the ACMs are of a minor nature and is not likely to reoccur due to accessibility or activity. This method of repair is chosen in situations where performing the repair activities will not cause significant disturbance to the underlying material. Typical repairs include the repair of thermal insulation by the application of mastic (paint adhesive) to lagging (canvas cloth). The repair of sprayed fireproofing or acoustical texturized material can involve the application of an encapsulant to limited areas of abraded or damaged material. If this option is followed, the sprayed material must be capable of supporting the additional weight of the encapsulant.

Enclosure

An enclosure consists of the construction of a physical barrier, typically constructed from drywall or metal sheeting. This option is applicable in situations where the removal of materials with asbestos is not practicable, is of a high financial cost, or where damage is likely to occur without a protective barrier. Where the installation of the barrier is likely to disturb the ACMs, the work must be performed in isolation from the building's normal environment.

Removal

This option is recommended in situations where the ACMs are damaged beyond repair and the material is highly likely to be damaged due to nearby activities, by renovation or during demolition. The precautions employed may vary depending on the volume of the material to be removed and whether the material is friable or not. Typical programs can include the use of glove bags for limited amounts of thermal pipe insulation or minor amounts of fireproofing may be removed within a small polyethylene lined enclosure.

For larger amounts of asbestos, more stringent protocols are used and consist of attached shower facilities, the establishment of a negative pressure differential, a filtration system for the air and monitoring for exposure to asbestos fibres.

LEAD-IN PAINT SURVEY METHODOLOGY

This following information summarizes the sampling and analysis methodology used during the survey for lead in paint.

XRF Methodology

XRF readings were collected during the assessment

Testing for lead in paint was carried out using an X-ray Fluorescence (XRF) Spectrum Analyser. Painted surfaces contain concentrations of various elements which the XRF can detect using low-level radioactivity. The XRF unit is positioned against the exposed painted surface and the radiation from the XRF is directed at the painted surface. The radiation is absorbed by the painted surface and emits energy back to the analyzer as fluorescence. The level of fluorescence will be distinctive to a particular element present in the paint. Lead emissions are measured by the analyzer, and then converted into an electrical signal. The analyzer uses this electric signal to calculate and display the lead concentration in the paint surface. The low levels of radiation provide for accurate readings with the precision of ± 0.05 mg/cm^2 when measuring lead concentrations. The XRF is equipped with a depth index that indicates where the lead is located within the paint layers. The detection limit of the instrument varies with depth and ranges from 0.002 mg/cm^2 to 0.05 mg/cm^2. The analyzer used by OHE performs an automatic self-calibration/quality control check when the unit is switched on.

Bulk Sampling Methodology

No bulk samples were collected during the assessment.

Bulk Sample Analysis Methodology

Bulk samples of suspect lead-containing materials were analyzed in accordance with a US EPA method for the determination of lead content in bulk materials, EPA Method (SW 846 3050B/7000B). The EPA Method requires that the samples be analyzed using the Flame Atomic Absorption Spectrometry (SW 846 3050B/7000B) technique. This method may be used determine trace elements in solution.

Methodology for the Investigation of PCB-Containing Equipment

Direct visual assessments were completed during the assessment.

The investigation typically includes a representative and random examination of fluorescent lamp ballasts and transformers. Information collected from the labels of light ballasts is cross referenced with the Environment Canada publication entitled "Identification of Lamp Ballasts Containing PCBs" (Revised August 1991). The investigation is restricted to the equipment observed and excludes PCB-containing components that may be concealed. Due to safety precautions, only the exterior of electrical equipment is inspected. If the equipment labels do not provide enough information on the contents with respect to the subject substances, the findings are noted and recommendations regarding the next course of action are provided.

Methodology for the Investigation of Ozone Depleting Substances (ODS)

Direct visual assessments were completed during the assessment.

The investigation for ODSs included equipment and building systems that are suspected to contain ODSs, including but not limited to, chillers, coolers, refrigerators and HVAC systems. The investigation was restricted to the equipment observed and excludes components that may be concealed. Due to safety precautions, only the exterior of devices, equipment and building systems were inspected. If the equipment labels did not provide enough information on the contents with respect to the subject substances, the findings were noted and recommendations regarding the next course of action were provided.

Methodology for the Investigation of Mould and Water Damaged Building Materials and animal droppings

The investigation for mould and water damaged building materials included a visual inspection along accessible building finishes (eg. walls, floors, ceilings, etc.).

GE Protimeter Survey Master Moisture Meter

The moisture content of building materials was assessed using a GE Protimeter Survey master moisture meter. This moisture meter was used to assess the moisture content (%MC) and/or wood moisture equivalent (%WME) of porous building materials which reportedly had been impacted by water. In search mode, the moisture meter is held at

25˚ angle against the surface in question to detect relative %MC/WME beneath the surface of the material in question. In measure mode, the moisture meter pin electrodes are inserted into the suspect substrate to obtain the (%MC/WME) of various material(s) between the electrodes. The values obtained are compared against reference value(s) ("the control") of known "dry" building material(s). The reported values are summarized in the table below:

Less than 17% MC/WME	"DRY"	Optimal state
17-20% MC/WME	"AT RISK"	Moist conditions that may or may not support mould amplification*
Greater than 20% MC/WME	"WET" or "SATURATED"	High water activity and the likelihood of mould amplification*

* Mould amplification is dependent upon current environmental conditions and the composition of the building materials.

The investigation for animal droppings included a visual inspection of accessible building locations.

METHODOLOGY FOR THE INVESTIGATION OF OTHER HAZARDOUS SUBSTANCES

The scope of work for the subject survey also consisted of a visual inspection for the presence of other potentially hazardous building materials and substances including mercury, silica, manmade mineral fibres, urea formaldehyde foam insulation and aboveground/underground storage tanks.

APPENDIX H PROJECT LIMITATION

PROJECT LIMITATIONS

Hazardous building materials may be present in areas not accessible for view and identification. In situations where hazardous building materials extend into a non-accessible area, the materials were assumed to also be present in those areas and have been reported as such. Contractors and maintenance personnel must be warned of the possibility of undisclosed hazardous building materials in enclosed areas. All hazardous building materials discovered in these areas must be treated as a hazardous building material until proven otherwise by sampling and analysis as per all applicable regulations and guidelines.

Asbestos is assumed to be present in various building materials which were not sampled as part of the survey since they were excluded from the scope of work. These materials include, but are not limited to vermiculite in solid block walls; materials located above solid ceilings and in manufactured wall panels; elevator and lift brakes; high voltage wiring; mechanical packing, ropes and gaskets; exterior cladding, soffit and fascia boards on building; roofing materials; caulking and mastic material; bell and spigot; and paper and refractory materials within boilers. In cases of demolition and/or renovation, all excluded materials (i.e., suspected ACMs) shall be assumed asbestos-containing until proven otherwise by bulk sampling and analysis.

In cases where asbestos was identified in some but not all samples of similar materials, all such material was assumed and reported to contain asbestos. When a renovation is planned, we recommend a detailed sampling of suspected asbestos-containing material to confirm the presence of asbestos. Materials that are removed through renovations must be replaced with non-asbestos-containing materials only. This must be documented. Confirmatory sampling will not be required on any new products if the manufacturer supplies written confirmation that these materials are asbestos-free.

Mould impacted and water damaged building materials were observed in various locations throughout the Subject Location. The locations detailed in this report are based on the observations noted at the time of the site visit and can change over time and if the source of water intrusion is not corrected if site conditions change. For removal and/or repair operations, these areas should be confirmed on-site

APPENDIX I HISTORICAL DATA

INTENTIONALLY OMITTED

1. PART 1 – GENERAL

1.1 General Conditions and Related Work

1.1.1 This section forms a part of the Contract Document and should be read in conjunction with all other Sections and Divisions in order to comply with the requirements of the General Conditions of the Contract.

1.1.2 It is the intent that work performed as outlined in this section will result in the disturbance or removal and disposal of all asbestos-containing materials, lead-containing materials, existing asbestos and lead contaminated materials and materials that become contaminated by asbestos and lead as a result of the work specified by this Section. The referenced hazardous building materials include, but are not limited to, asbestos-containing Mechanical Systems Insulation (MSI) in the forms of parging cement and paper material; and lead-containing orange, beige, grey, white, black, green, dark green, red, dark brown and cream paints.

1.1.3 **It should be noted that the quantity and extent of asbestos-containing materials that require abatement or will be disturbed shall be determined based on the scope of work and/or the requirements of the renovation project. All asbestos-containing materials that will be disturbed, or may be disturbed as part of the renovation project, shall be removed following the appropriate operation procedures, as specified.**

1.1.4 **It should be noted that the quantity and extent of lead-containing materials that require abatement or will be disturbed shall be determined based on the scope of work and/or the requirements of the renovation project. All lead-lead-containing paints and associated substrate materials (e.g. drywall, wood, etc.) that will be disturbed, or may be disturbed as part of the renovation project, shall be removed following the appropriate operation procedures, as specified.**

1.1.5 **Although not necessarily part of the scope of work, Contractors should be aware that asbestos-containing paper material is present above the metal deck in the elevator shaft at the building. Should this material be disturbed or likely to be disturbed during the work, the Contractor shall notify the Environmental Consultant and the client immediately.**

1.1.6 Dispose of all waste as specified in applicable sections of the specifications document.

1.1.7 The Environmental Consultant may perform area and personal air monitoring to verify the effectiveness of dust suppression methods and adequacy of the respirators used by the Contractor. Contractor's personnel shall co-operate with the Inspector in collecting air samples.

1.1.8 This project and all work associated with it is regulated by The Occupational Health and Safety Act; the Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05; the Designated Substances Regulation, Ontario Regulation 490/09; the Guideline: "Lead on Construction Projects" (issued by Ontario Ministry of Labour); the Regulation for Construction Projects, Ontario Regulation 213/91.

1.1.9 Provide all equipment, material, services, supervision and labour required or specified to complete the scope of work of this project as described in the Contract and Specifications Documents.

1.1.10 The contractor shall inform the Environmental Consultant upon discovery of additional asbestos-containing materials during asbestos operation procedures.

1.1.11 The number of enclosures shall be approved by the client and consultant prior to the commencement of abatement.

1.1.12 If materials overlap within a work area, the contractor shall contact the client and consultant to approve the enclosure set up prior to commencement of work.

1.1.13 It is assumed that the results presented apply to all paint(s) of the same colour.

1.1.14 It is the contractor responsibility to conduct leachate (toxicity) testing in order to characterize the lead waste prior to its disposal.

1.1.15 In cases of conflict between procedures outlined in this document, the more stringent requirement will apply.

1.2 Description of Work

1.2.1 Before submitting a bid, confirm the scope of work of the project by visiting the site and reading the entire Contract documents. The information presented is for general information purposes and should not be used as the only basis for submitting a bid.

1.2.2 **It is the abatement contractor's responsibility to determine the quantities, and the total number, location, and extent of enclosures required for each work area to complete the scope of work and make appropriate allowances.**

1.2.3 **Work Area 1 – Elevator Room, Minor Football Storage Rooms 011 and 009, Corridor C03, Corridor C02 and Washroom 018:**

1.2.3.1 The asbestos-containing building materials in this work area include, but are not limited to, MSI in the form of parging cement. The lead-containing materials in this work area include, but are not limited to orange, beige, grey, white, black, green, dark green, red, dark brown and cream paints.

1.2.3.2 If the areas with asbestos-containing materials and lead-containing materials are likely to be disturbed, the following applies to the work area:

1.2.3.2.1 The removal and/or disturbance of asbestos-containing MSI in the form of parging cement shall be carried out following Type 2 Glove Bag Operation procedures as specified in Sub-Section 3.3. This includes the removal of any concealed MSI that could potentially be present in wall/ceiling cavities.

1.2.3.2.2 The removal and/or disturbance of lead-containing paints using non-powered hand tools, other than manual scraping and sanding, or powered tools that are attached to dust-collecting devices equipped with HEPA filters shall be carried out following Type 1 Operation procedures as specified in Sub-Section 3.8.

1.2.3.2.3 The removal and/or disturbance of lead-containing paints using non-powered hand tools by scraping, sanding and manual demolition, shall be carried out following

Type 2a Operation procedures as specified in Sub-Section 3.9. Erect enclosure that is air tight and water tight that is made of fibre reinforced polyethylene (poly) sheeting and tape to separate the area of removal and/or disturbance from the rest of the building. Pre-clean all surfaces to be protected. All surfaces that are not scheduled for removal within an enclosure (i.e. walls, ceiling and floors) shall be protected using one (1) layer of fibre reinforced poly sheeting. Negative pressure shall be established inside the enclosure with the use of negative air units that are Dispersed Oil Particulate (DOP) tested onsite or vented to the outdoors.

1.2.3.2.4 The removal of water damaged and mould impacted drywall ceiling and the west wall in the elevator room in the basement shall be carried out following Level I Operation procedures as specified in Sub-Section 3.5.

1.2.3.3 Pre-clean and remove all moveable objects and items present in the work area.

1.2.3.4 Clean and protect all sensors and pneumatic controls and lines if not scheduled for removal. Reinstate such items to an as found condition if they were removed to facilitate the abatement operations.

1.2.3.5 The abatement contractor shall install scaffolding, if it is required, to access the materials to be abated, as required.

1.2.3.6 Shut off, lock out, all ventilation, and seal all vents, ductwork, doors, or other openings into the work area, with the application of rip-proof polyethylene (poly) sheeting and properly seal. This shall be completed as part of the preparation phase of the work.

1.2.3.7 Maintain the fire alarm and other life/safety systems in operation. Immediately advise the Consultant in case the systems are damaged during the execution of the work.

1.2.3.8 The abatement Contractor shall be responsible for providing their own temporary lighting inside the enclosure, if it is required.

1.2.3.9 All asbestos waste generated in the work area shall be double bagged using asbestos labelled yellow bags and disposed of as asbestos waste.

1.2.3.10 All lead waste generated in the work area shall be disposed of as specified in Section 1.16.

1.2.4 **Removal and Disposal of Polychlorinated Biphenyls (PCBs):**

1.2.4.1 Extract all light ballasts and transformers, clean and place in a temporary staging area pending an examination by the Consultant to determine PCB content. All PCB-containing ballasts (as identified by the Consultant) shall be placed in steel drums properly labeled and shall be disposed of according to applicable environmental regulations. The Contractor shall be responsible for arranging and paying for the cost of disposal. A copy of the certificate of destruction shall be submitted to the Consultant once the PCB-containing materials are disposed of. This scope of work shall apply to any other PCB-containing equipment (i.e. capacitors, transformers, etc.).

1.2.5 **Removal of Mercury Containing Equipment:**

1.2.5.1 If required as part of the renovation project, the Contractor shall be responsible for safely extracting all equipment which contains mercury. The waste must be stored

in airtight containers or covered with water or oil and kept in a cool place until they are properly disposed of. Containers must be properly labeled. The Contractor shall arrange for the proper transportation and disposal of the waste in accordance with applicable environmental and health and safety acts and regulations.

1.3 Definitions

1.3.1 Abatement: Procedures to control fibre release from asbestos containing building materials. Includes encapsulation, enclosure, and removal.

1.3.2 Amended Water: Water containing a wetting agent or surfactant that is added for the purpose of reducing water surface tension to allow proper wetting of asbestos material.

1.3.3 Asbestos: The term includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, and any of these that have been chemically treated and/or altered.

1.3.4 Airlock: A system for ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, consisting of two curtained doorways at least 6 feet apart.

1.3.5 Area Monitoring: Sampling of asbestos fibre concentrations within the asbestos control area and outside the asbestos control area which is representative of the airborne concentrations of asbestos fibers which may reach the breathing zone.

1.3.6 Asbestos Work/Control Area: An area where asbestos removal operations are performed which is isolated by physical boundaries to prevent the spread of asbestos dust, fibers, or debris.

1.3.7 Air Monitoring: The process of measuring the asbestos fibre content of a specific volume of air in a stated period of time.

1.3.8 Asbestos Containing Material (ACM): Any material analyzed and found to contain 0.5 percent more asbestos either alone or mixed with other fibrous or nonfibrous materials.

1.3.9 Asbestos Fibers: For this specification, asbestos fibers are those fibers 5 microns or longer having an aspect ratio of at least 3:1.

1.3.10 Authorized Visitor: The building Owner or their representative, persons of any regulatory or other agency having jurisdiction over the project and the asbestos abatement Consultant or their representative.

1.3.11 Barrier: Any surface that closes up the work area to prevent the movement of fibres.

1.3.12 Curtained Doorway: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, constructed by placing two overlapping sheets of rip-proof plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway. The free bottom edge of the plastic sheets shall be weighted to ensure proper closure. The plastic sheets shall over lap by no less than 1.5 meters.

1.3.13 Critical Barrier: One or more layers of plastic sealed over all openings into a regulated area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a regulated area form migrating to an adjacent area.

1.3.14 Chemical Stripping Agent Neutralizer: Chemical stripping agent neutralizers may be used on exterior surfaces only. Neutralizers shall be compatible with and not harmful to the substrate that they are applied to and the stripping agent that has been applied to the surface substrate.

1.3.15 Chemical Stripping Removers: Chemical removers shall contain no methylene chloride products and shall be compatible with and not harmful to the substrate that they are applied to.

1.3.16 Contractor/Supervisor: An individual who supervises asbestos abatement work and has the proper qualifications and training as specified in this document.

1.3.17 Control Area: An area which is considered uncontaminated and is suitable for regular occupancy.

1.3.18 Disposal: Procedures necessary to transport and deposit the asbestos contaminated material stripped and removed from the building, piping, and equipment in an approved waste disposal site in compliance with the applicable environmental regulations.

1.3.19 Demolition: The razing, removing or wrecking of any building component, assembly or system together with any associated handling operations.

1.3.20 Decontamination Area: An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

1.3.21 Dispersed Oil Particulate (DOP) Test: A test method that uses Dispersed Oil Particulate to challenge a HEPA filter-equipped negative pressure unit to determine its integrity and effectiveness to filter out asbestos fibres.

1.3.22 Dirty Room: A contaminated area or room which is part of the worker decontamination enclosure system, with storage for contaminated clothing and equipment.

1.3.23 Emery 3004 – a compound (a poly-alpha olefin) that may be substituted for DOP in HEPA filter testing.

1.3.24 Encapsulant: A liquid material which can be applied to asbestos containing material and which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A third type of encapsulant (removal encapsulant) is a penetrating encapsulant and is designed to be applied during the removal of asbestos-containing materials to minimize the release of fibres.

1.3.25 Disposal Bag: A 0.15 mm 6 mil thick, leak-tight plastic bag, pre-labeled as containing asbestos waste and used for transporting asbestos waste from containment to disposal site.

1.3.26 Disturbance: Activities that disrupt the matrix of ACM, crumble or pulverize ACM, or generate visible debris from ACM.

1.3.27 Encapsulation: Procedures necessary to coat all asbestos-containing materials with an encapsulant to control the possible release of asbestos fibers into the ambient air.

1.3.28 Enclosure: All herein specified procedures necessary to complete enclosure of all hazardous materials behind airtight, impermeable, permanent barriers.

1.3.29 Equipment Room: A contaminated area or room which is part of the worker decontamination enclosure system, with storage for contaminated clothing and equipment.

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

1.3.31 Filtration System for Water: A multistage system for filtering water from the decontamination shower and wastewater. The system is usually manufactured with two filters: a primary filter and a secondary filter. The primary filter collects and retains particles that are 20 microns or larger and the secondary filter removes particles that are 5 microns or larger.

1.3.32 Glove Bag System: A portable asbestos abatement system designed for the isolation of an object from which materials containing asbestos are to be removed.

1.3.33 HEPA Filter Equipment: High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall be capable of trapping and retaining at least 99.97 percent of 0.3 micrometer diameter particles.

1.3.34 Lead: The term includes elemental lead, and/or inorganic and organic lead compounds derived from chemically treated and/or altered elements (i.e. paints, plastics, pigments, glasses, and rubber compounds).

1.3.35 Lead Cleaning Agent: A cleaning agent suitable for lead dust. Acceptable detergents include products with a high phosphate content (containing at least 5% trisodium phosphate) and/or phosphate-free lead dissolving agents such as Ledisolv™ or similar product.

1.3.36 Lead Lechate Material: Any material analyzed and found to have a concentration equal to or greater than 5.0 milligrams per litre (mg/l) or 100 milligrams per kilogram (mg/kg)/ micrograms per gram (µg/g) as per O. Reg. 558, Schedule 4, Leachate Quality Criteria, February 2001.

1.3.37 Lead Surface Contamination: Any surfaces analyzed and found to have a concentration equal to or greater than 40 micrograms per square feet (µg/ft2) or 4 micrograms per 100 square centimetres (µg/cm2) for floors, 250 µg/ft2 (25 µg/cm2) for window sills, and 400 µg/ft2 (40 µg/cm2) for window troughs as per the U.S. Environmental Protection Agency (EPA) Lead, Identification of Dangerous Levels of Lead, Final Rule, January 2001 (40 CFR Part 74).

1.3.38 Lead Waste Container: An impermeable container acceptable to a disposal site and Ministry of the Environment. It shall be labeled as required by the Ministry of the Environment and Transport Canada.

1.3.39 Lead Work Area: An area where lead removal operations are performed which is isolated by physical boundaries to prevent the spread of lead dust or debris.

1.3.40 Negative Pressure Fan System: An air purifying fan system located within or outside the isolated work area, which draws air out of the work area through a HEPA filter and discharges this air directly to the exterior of the building, thus keeping the static air pressure in the work area lower than in adjacent areas and preventing infiltration of contaminated air from work area to adjacent areas. This system shall be equipped with an alarm to warn of system breakdown, shall maintain a minimum pressure differential of 0.02" water gauge relative to adjacent areas outside of work areas and shall be equipped with an instrument to continuously monitor and automatically record pressure differences.

1.3.41 Non-friable Asbestos Material: Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers during any appropriate use, handling, demolition, storage, transportation, processing, or disposal.

1.3.42 Negative Pressure Respirator: A respirator in which the air inside the respiratory inlet covering is negative during inhalation in relation to the air pressure of the outside atmosphere and positive during exhalation in relation to the air pressure of the outside atmosphere.

1.3.43 Powered Air Purifying Respirator (PAPR): A full-face mask into which filtered air is pumped at approximately 100 – 150 litres per minute (4 – 6 cubic feet per minute). The PAPR consists of a full-face mask, a battery pack, an air pump, high efficiency filter and hoses.

1.3.44 Personal Monitoring: Sampling of asbestos fibre concentrations within the breathing zone (within 12 inches of the mouth) of an employee.

1.3.45 Personnel: Supervisors, Contractor employees, subcontractor employees.

1.3.46 Positive Pressure Respirator: A respirator that maintains a positive pressure inside the facepiece during inhalation and exhalation in relation to the atmospheric pressure.

1.3.47 Shower Room: A room between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water and arranged for complete showering during decontamination. The shower room comprises an airlock between contaminated and clean areas.

1.3.48 Supplied-air respirator – an accepted respirator and air-supply hose with a hood/helmet, a tight fitting facepiece that is supplied with compressed breathing air from a compressed breathing air system.

1.3.49 Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

1.3.50 Tape-Sealed Polyethylene Sheets: Rip-proof polyethylene sheets or polyethylene sheets of type and thickness as specified, sealed with tape along the edges, around objects, over cuts and in other locations as required to provide a continuous polyethylene membrane to protect underlying surfaces from water damage and damage by sealant and to prevent the escape of asbestos fibres through the sheeting into a clean area.

1.3.51 Wet Cleaning: The process of eliminating asbestos from building surfaces and objects by using cloths, mops, or other cleaning tools dampened with water.

1.3.52 Work Decontamination Enclosure System: A decontamination system for workers, consisting of a clean room, a shower room, and an equipment room. One entrance to the clean room shall be outside of the contaminated area. One entrance to the equipment room shall be connected directly to the contaminated area.

1.3.53 Work: Includes all labour, supervision, materials and equipment required for the complete execution of the project as specified in the contract.

1.4 Work Schedule

1.4.1 It is the responsibility of the contactor to provide the necessary manpower and work shifts to meet the schedule as specified below: in the contract documents.

1.4.2 The start date for the project will be outlined in the contract documents.

1.4.3 The Contractor shall, at no extra cost to the owner, be responsible for the completion of work required or scheduled to be performed on weekends, holidays and after regular hours and shall be carried out as required to meet the schedule specified.

1.4.4 In all situations where the Contractor fails to meet the specified schedule, the Contractor shall pay all costs of inspection and air monitoring by the Environmental Consultant.

1.5 Submittals

1.5.1 All submittals must be received by the Consultant or their representative before the work is allowed to commence.

1.5.2 The Contractor shall submit the following:

1.5.3 Proof that the Contractor has made arrangement for the transport and disposal of asbestos waste. The proof shall be satisfactory to the Consultant.

1.5.4 Name of the landfill.

1.5.5 A copy of the weight scale or waste manifest/bill of lading (once received).

1.5.6 Proof satisfactory to the Consultant that each Supervisor scheduled to work on the project has successfully completed an approved asbestos abatement course and can provide an up to date training certificate issued by a competent entity.

1.5.7 References that each and every supervisor had supervised a minimum of 7 other asbestos removal projects of similar size and scope. One supervisor shall remain on site while asbestos removal or cleanup is being carried out.

1.5.8 Copies of Insurance certificates and Workplace Safety and Insurance Board status.

1.5.9 D.O.P test results and performance data for negative air unit systems.

1.5.10 Proposed work schedule.

1.5.11 Work force expected to be present on site daily.

1.5.12 Proposed number of shifts.

1.5.13 Layouts of proposed platforms and hoardings for the Consultant’s review and approval.

1.5.14 Layout of proposed waste and worker decontamination facilities and asbestos work area enclosures.

1.5.15 Proof that all workers have received Workplace Hazardous Material Information System (WHMIS) training.

1.5.16 A WHMIS information package containing documentation addressing test results, flammability and fire data and Material Safety Data Sheets (MSDSs) for products, chemicals and materials used on site during the course of the asbestos abatement project.

1.5.17 Notice of Project form issued by the Ministry of Labour.

1.5.18 Proof satisfactory to the Consultant that each worker scheduled to work on the project has successfully completed an approved asbestos abatement course and can provide an up to date training certificate issued by a competent entity.

1.5.19 Proof satisfactory to the Consultant that each worker scheduled to work on the project has been fit tested for the appropriate respirator to be used.

1.5.20 Code of practice for respiratory protection.

1.5.21 Pressure differential monitoring data – to be submitted on a daily basis.

1.6 Quality Assurance

1.6.1 Ensure that work progresses according to schedule.

1.6.2 Ensure that work complies with all the requirements of the applicable regulations, guidelines and manuals.

1.6.3 Ensure that no water runoff or airborne asbestos material contaminates areas outside the asbestos removal work area enclosures. The Consultant has been given authorization by the Owner to stop any work where contaminations of areas outside enclosures are suspected. The Contractor shall be responsible for all costs to rectify the problem.

1.6.4 Use only skilled and qualified workers for all trades required to work on this project.

1.6.5 Only the asbestos abatement Contractor, and never the Consultant, is responsible for the following:

1.6.6 Safety programs and precautions required by applicable regulations for the work being performed.

1.6.7 Control over the acts and omissions of the Contractor’s workers, agents, subcontractors and other employees of the Contractor required to perform work on the project.

1.6.8 Control over construction techniques, methods, means or procedures.

1.7 Regulations

1.7.1 The Contractor shall comply with all local, provincial and federal requirements relating to asbestos and other work being carried out.

1.7.2 In case of conflict among the above mentioned requirements or with these specifications, the more stringent requirements shall apply.

1.7.3 Perform work following the requirements of the various regulations in effect at the time the work is being carried out.

1.7.4 The regulations shall include, but are not limited to:

1.7.4.1 Ontario Occupational Health and Safety Act.

1.7.4.2 Ontario Regulation 278/05, Regulation Respecting Asbestos on Construction Projects and in Building and Repair Operations.

1.7.4.3 Ontario Ministry of Environment Regulation 558/00 for the disposal of asbestos waste made under the Environmental Protection Act.

1.7.4.4 Regulations respecting the Handling, Offering for Transport and Transportation of Dangerous Goods.

1.7.4.5 Regulations for Construction Projects Ontario Regulation 213/91 made under the Occupational Health and Safety Act.

1.7.4.6 WHMIS Regulations.

1.8 Supervision

1.8.1 The Contractor shall provide a trained and qualified shift supervisor for each and every shift during which asbestos removal and clean up is being carried out. The Owner reserves the right to stop all work if this requirement is not complied with, at no additional charge to the Owner.

1.8.2 The qualification of the supervisor shall meet the requirements specified under Section 1.5 Submittals above.

1.8.3 The shift supervisor shall have the authority to make decisions and take actions with respect to production, manpower and equipment.

1.8.4 Obtain approval from the Owner of their representative before replacing supervisory personnel.

1.8.5 At the request of the Owner or their representative, the Contractor shall, without asking for explanation, replace supervisory personnel with 2 days from receiving the Owner’s written request.

1.9 Notifications

1.9.1 The Contractor shall be responsible for immediately notifying the following, orally and in writing, prior to any work on this project commencing:

1.9.1.1 Ontario Ministry of Labour, Construction Health and Safety branch closest to the location of the project.

1.9.1.2 The land fill site which agreed to accept the waste as per the requirements of regulation 558/00.

1.9.1.3 The Fire Marshall, in cases were the execution of the work will result in blocking building exists or when turning off, removing or temporarily altering fire alarms.

1.10 Proscriptions

1.10.1 The use of motorized lift equipment in the work area is not allowed.

1.10.2 The use of compressed air for removal or clean up of asbestos dust and debris from any surface is not allowed.

1.10.3 Smoking, eating, drinking or chewing is not allowed in the work area.

1.10.4 Unauthorized persons or persons not using proper personal protective equipment shall not be allowed to enter the work area.

1.10.5 No entry into the work area shall be permitted to any person who has facial hair growth that prevents the establishment of a proper seal between the respirator and the skin.

1.10.6 The use of torches, propane-fired heaters and other open flames shall not be permitted in the asbestos removal work area.

1.11 Equipment and Material Protection and Replacement

1.11.1 Before starting the removal operations, the Contractor shall perform a survey to document existing damage in all areas where asbestos removal will be carried out or in areas where transportation of waste will take place.

1.11.2 The Contractor shall be responsible for protecting all equipment and materials within, and in the vicinity of, the work area.

1.11.3 The Contractor shall be responsible for replacing all equipment and materials that become damaged as a result of the work being carried out by the Contractor at no additional cost to the owner.

1.12 Worker and Visitor Protection

1.12.1 Instruct all personnel (workers and visitors) in all aspects of work procedures and protective equipment before allowing entry into the asbestos abatement work areas.

1.12.2 A competent person (as defined by the Occupational Health and Safety Act) shall provide all the training and instructions.

1.12.3 Instructions and training shall include, but shall not be limited to, the following:

1.12.4 Entry and exit from asbestos abatement work areas.

1.12.5 Work practices and personal hygiene.

1.12.6 The use, cleaning and care of respirators and protective clothing.

1.12.7 Protective measures and work procedures.

1.12.8 Asbestos work area entry and exit procedures shall be posted in the clean room of the decontamination unit.

1.12.9 Respiratory Protection:

1.12.10 All personnel required to wear respirators shall be fit tested either by a qualitative or quantitative fit testing method.

1.12.11 Each worker or visitor required to enter an asbestos abatement work area shall be provided with a personally issued respirator that is:

1.12.12 Appropriate for the work that is being carried out.

1.12.13 Acceptable to the Ministry of Labour, Occupational Health and Safety Division.

1.12.14 The worker shall be responsible for wearing a respirator that is issued by the Contractor.

1.12.15 The following criteria, as outlined in Table 1, shall be followed when selecting an appropriate respirator:

Table 1: Respirators

Column 1		Column 2
Work Category		**Required respirator**
Type 1 Operations		
Worker requests that the employer provide a respirator to be used by the worker, as described in paragraph 12 of section 14		Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter
Type 2 Operations		
Work described in paragraph 1 of subsection 12 (3)		One of the following: - Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter - Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter - Negative pressure (demand) supplied air respirator equipped with a full-facepiece - Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)
Work described in paragraphs 2 to 7 and 9 to 11 of subsection 12 (3)		Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter
Type 3 Operations		
Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable material containing asbestos by means of power tools, if the tool is attached to a dust collecting device equipped with a HEPA filter as described in paragraph 8 of subsection 12 (3)	Material is not wetted	One of the following: - Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter - Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter - Negative pressure (demand) supplied air respirator equipped with a full-facepiece - Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)
Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable material containing	Material is wetted to control spread of fibre Material is not wetted	Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter Pressure demand supplied air respirator equipped with a half mask

Table 1: Respirators (continued)

Column 1		**Column 2**
Work Category		**Required respirator**
Type 3 Operations		
asbestos by means of power tools, if the tool is not attached to a dust collecting device equipped with a HEPA filter as described in paragraph 5 of subsection 12 (4)	Material is wetted to control spread of fibre	One of the following: - Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter - Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter - Negative pressure (demand) supplied air respirator equipped with a full-facepiece
		- Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)
Work with friable material containing asbestos, as described in paragraphs 1 to 4 and 6 of subsection 12 (4)	Material is not wetted	Pressure demand supplied air respirator equipped with a full facepiece
Work with friable material, as described in paragraphs 1 to 4 and 6 of subsection 12 (4), that contains a type of asbestos other than chrysotile	Material was applied or installed by spraying, and is wetted to control spread of fibre	Pressure demand supplied air respirator equipped with a half mask
Work with friable material, as described in paragraphs 1 to 4 and 6 of subsection 12 (4), that contains only chrysotile asbestos		One of the following: - Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter - Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter - Negative pressure (demand) supplied air respirator equipped with a full-facepiece - Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)
Work with friable material containing asbestos, as described in paragraphs 1 to 4 and 6 of subsection 12 (4)	Material was not applied or installed by spraying, and is wetted to control spread of fibre	One of the following: - Air purifying full-facepiece respirator with N-100, R-100 or P-100 particulate filter - Powered air purifying respirator equipped with a tight-fitting facepiece (half or full-facepiece) and a high efficiency filter or N-100, P-100 or R-100 particulate filter - Negative pressure (demand) supplied air respirator equipped with a full-facepiece - Continuous flow supplied air respirator equipped with a tight fitting facepiece (half or full-facepiece)

1.12.16 Respiratory protection systems shall be certified by the National Institute for Occupational Safety and Health (NIOSH), the British Standards Institution or any other testing agency that is acceptable to the Ministry of Labour.

1.12.17 Respirator shall be stored in a clean location such as the clean room of the decontamination unit. This room can also be used for charging PAPR batteries.

1.12.18 The procedures specified by the equipment manufacturer shall be followed while using and maintaining the respirators.

1.12.19 Respirators shall be cleaned and inspected at the end of each shift. All damaged and deteriorated parts found during the inspection shall be replaced before the respirator is used again.

1.12.20 Appropriate combination cartridges shall be used if substances other than asbestos are to be handled inside the asbestos removal work area.

1.12.21 Used filters shall be tested and replaced as specified by the manufacturer or as specified below. The more stringent testing and replacement protocol shall be followed.

1.12.22 Cartridges for negative pressure respirators should be replaced every 16 hours of actual usage

1.12.23 Cartridges for PAPRs should be replaced every 8 hours.

1.12.24 Cartridges shall be treated as asbestos waste and shall be disposed of accordingly after usage inside an asbestos removal work area.

1.12.25 Protective Clothing:

1.12.26 The Contractor shall provide every worker and authorized visitor with full body disposable coveralls.

1.12.27 All personnel shall wear the protective coveralls before they are allowed to enter into the asbestos removal work area.

1.12.28 Coveralls shall be equipped with head covering (hood), foot covering and tight fitting cuffs at the neck, ankles and wrists.

1.12.29 The disposable coveralls shall be made up of materials that does not readily permit the penetration of asbestos fibers.

1.12.30 Disposable coveralls shall be immediately repaired (using duct tape) or replaced once torn.

1.12.31 Coveralls shall be disposed of as asbestos waste once they are worn inside an asbestos abatement area.

1.12.32 Workers are allowed to wear reusable protective clothing provided that the clothing is left in the equipment room until the end of the asbestos abatement project. The clothing shall then be disposed of as asbestos waste.

1.12.33 Safety shoes, hard hats and additional body protection equipment shall be used as necessary to meet the requirements of applicable safety regulations.

1.13 Inspections

1.13.1 The asbestos abatement Consultant may be present on site to carry out quality control inspections for the entire duration of the project. The inspections will be performed inside and outside the work areas.

1.13.2 The purpose of the inspections is to ensure that the work is being carried out following the requirements and procedures outlined in the specifications documents and applicable regulations.

1.13.3 The Consultant will issue written instructions to the asbestos abatement Contractor throughout the duration of the project. The instructions will authorize the Contractor to proceed to next phase of work. The general phases of work will consist of the following: Pre-cleaning, set-up and preparation of the work area, removal of specified materials, clean-up of work area and tear down of containment.

1.13.4 The Contractor shall not proceed to the next phase of work without obtaining authorization form the Consultant.

1.13.5 The Consultant has been given authorization by the Owner to order a shutdown of work in case contamination of areas adjacent to controlled work areas has occurred.

1.13.6 In all non-controlled areas where it is determined by the Consultant (through visual inspection or air monitoring) that contamination has leaked, the Contractor shall be responsible to the complete isolation and cleaning of such areas under the direction of the Consultant and at no extra charge to the Owner.

1.13.7 The Consultant has been given authorization by the Owner to ensure that the Contractor adheres to specified procedures and materials and to inspect for completion and final cleanliness. Any additional work (including labour and material charges) specified by the Consultant to achieve completion of work to the level specified shall be carried out by the Contractor at no additional charge to the Owner.

1.13.8 The Contractor shall ensure that all equipment and materials to be used on the project are acceptable to the Consultant. Unacceptable materials and equipment shall be replaced by the Contractor at no additional charge to the Owner.

1.13.9 The Contractor shall be responsible for all additional inspection charges which are carried out as a result of a failure by the Contractor to meet set criteria relating to schedule, health and safety and quality.

1.14 Air Monitoring

1.14.1 Air samples will be collected, if required, by the Consultant (on behalf of the owner) from the start of work until the completion of the tear down operations, both inside and/or outside the controlled work areas.

1.14.2 The objective of air monitoring is to detect defects in the containment of controlled areas and to ensure that any contamination of building spaces beyond the controlled areas is discovered and rectified immediately.

1.14.3 Any contamination of areas outside the limits of the controlled work areas (as determined by air monitoring) shall be contained and shall be thoroughly cleaned to the Consultant's satisfaction. The Contractor shall be responsible for all additional charges associated with such work.

1.14.4 Air monitoring will be carried out following procedures specified in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) method 7400A. The samples will be analyzed by the Phase Contrast Microscopy (PCM) technique as specified in NIOSH method 7400A. A Fibrous Aerosol Monitor (FAM) may also be used.

1.14.5 The Contractor shall cooperate with the Consultant during air monitoring and shall:

1.14.6 Provide workers to wear the sampling equipment for up to the duration of an entire shift.

1.14.7 Ensure that the workers exercise care and avoid damaging the Consultant's equipment.

1.14.8 Ensure that the samples and equipment are not tampered with.

1.14.9 The Contractor shall be responsible for charges associated with re-sampling due to tampering with the air samples.

1.14.10 The Contractor shall be responsible for repair or replacement charges of testing equipment that become damaged due to the actions of the Contractor forces.

1.14.11 The maximum allowable concentration of airborne fibres outside an asbestos work area is 0.05 fibres per cubic centimetre (fibre/cc).

1.14.12 PCM or FAM results equal to or greater than the specified level will indicate asbestos contamination of these perimeter areas.

1.14.13 The contaminated areas shall be isolated, contained and cleaned to the satisfaction of the Consultant.

1.14.14 The maximum allowable concentration of airborne fibres inside an asbestos work area is 2.5 fibres/cc.

1.14.15 Clearance air samples will be collected inside the work area after it is visually inspected by the Consultant, authorization is given to spray a lock-down agent and the lock-down agent is allowed to completely dry-up.

1.14.16 Air samples will be analyzed by the PCM method. The area will be considered clean and clear for public occupancy only if the fibre levels are less than 0.01 fibres/cc.

1.14.17 In case the fibre levels are equal to or greater than 0.01 fibres/cc, the Contractor shall be responsible for re-cleaning the asbestos work area and re-applying the lock-down agent. This process will have to be repeated until the fibre levels are below the specified limit.

1.14.18 The Contractor shall be responsible for all charges associated with additional air monitoring which can only be carried out by the Consultant.

1.14.19 Clearance air sampling will be carried out using aggressive sampling procedures as specified in O. Reg. 278/05, S.18(6).

1.14.20 The exhaust from forced air equipment (such as a 1 horsepower leaf blower) is directed towards ledges, ceilings, floors, walls and other surfaces in the room before the sampling pumps are started.

1.14.21 The forced air equipment will be operated for a period of 5 minutes for every 1,000 square feet of floor space.

1.14.22 The 20” fan(s) is then located in the middle of the room, placed on slower speed and directed towards the ceiling.

1.14.23 One 20” fan will be employed for every 10,000 cubic feet of room space.

1.15 Waste Transport and Disposal

1.15.1 All hazardous materials, including but not limited to, asbestos-containing materials, and equipment and systems containing mercury, polychlorinated biphenyls (PCBs), and ozone depleting substances (ODSs), existing asbestos, lead, mercury, PCBs and ODS contaminated materials and materials that become contaminated by asbestos, lead, mercury, PCB and ODSs as a result of the work, shall be disposed of as prescribed by Ontario Regulation 347, Waste Management Regulation, made under the Environmental Protection Act and the provincial and federal regulations for the Transportation of Dangerous Goods.

1.15.2 All wash water generated from decontamination activities shall be treated as asbestos waste and shall be disposed of accordingly.

1.15.3 All non-asbestos containing waste generated during demolition activities inside an asbestos work area shall be treated as asbestos waste.

1.15.4 Non-porous materials that can be washed and properly cleaned can be disposed of as clean waste.

1.15.5 All sharp asbestos-contaminated materials (such as hangers, T-bars, wood, etc) that could rip or damage a 6mil polyethylene waste disposal bag shall be disposed of in a sealed solid asbestos waste container.

1.15.6 The waste must be stored and transported in an enclosed, lockable waste bin.

1.15.7 Every vehicle used for the transportation of asbestos waste shall display a Class 9 Label.

1.15.8 Both sides of the vehicle used for the transportation of asbestos waste and every waste bag and container shall display the word CAUTION in letters not less than 10 cm in height and the words:

CONTAINS ASBESTOS FIBRES
Avoid Creating Dust

Asbestos May Be Harmful to Your Health

Wear Approved Protective Equipment

1.15.9 The transport vehicle must be properly equipped to deal with asbestos waste spills. Equipment shall include, but not limited to, respiratory protective equipment, disposable protective clothing, 6 mil polyethylene bags, shovel and broom and wetting agent.

1.15.10 For asbestos waste of unknown material or an asbestos type other than Chrysotile, the words Asbestos, Blue, Product Identification Number 2212 must be displayed on every waste container.

1.15.11 For Chrysotile asbestos, the words Asbestos, White, Product Identification Number 2590 must be displayed on every waste container.

1.15.12 The Contractor shall submit to the Consultant a copy of the shipping document and weight receipt for every shipment of asbestos waste.

1.16 Waste Transport and Disposal

1.16.1 It is assumed that the results presented apply to all paint(s) of the same colour.

1.16.2 It is the contractor responsibility to conduct leachate (toxicity) testing in order to characterize the lead waste prior to its disposal.

1.16.3 All lead-containing and lead-contaminated materials shall be disposed of as prescribed by Ontario R.R.O 1990, Regulation 347/90 as amended, Waste Management Regulation, made under the Environmental Protection Act and the provincial and federal regulations for the Transportation of Dangerous Goods. Based on the results of the laboratory analysis for the representative paint samples submitted in accordance with Ontario Regulation 347/90 (as amended) waste classification protocols, the white, the dark grey and the red paint colours are classified as hazardous waste and the remaining paint colours are classified as non-hazardous waste.

1.16.4 **In all situations where lead-containing paint is identified on metal building components and/or objects and items, the contactor shall recycle the metal instead of disposing of it as hazardous or non-hazardous waste.**

1.16.5 All wash water generated from decontamination activities of the hazardous material, including lead, shall be treated as hazardous waste and shall be disposed of accordingly.

1.16.6 All non-hazardous waste generated during demolition activities inside work area(s) involving hazardous materials, including lead, shall be treated as hazardous waste.

1.16.7 Non-porous materials that can be washed and properly cleaned can be disposed of as clean waste.

1.16.8 All sharp lead-contaminated materials (such as hangers, T-bars, wood, etc) that could rip or damage a 6mil polyethylene waste disposal bag shall be disposed of in a sealed solid waste container.

1.16.9 The waste must be stored and transported in an enclosed, lockable waste bin.

1.16.10 Every vehicle used for the transportation of lead waste shall display the proper Class Label.

1.16.11 Every waste bag and container shall display the word CAUTION in letters not less than 10 cm in height and the words:

CONTAINS LEAD WASTE

Avoid Creating Dust

Lead May Be Harmful to Your Health

Wear Approved Protective Equipment

1.16.12 The transport vehicle must be properly equipped to deal with lead waste spills. Equipment shall include, but not limited to, respiratory protective equipment, disposable protective clothing, 6 mil polyethylene bags, shovel and broom and wetting agent.

1.16.13 The Contractor shall submit to the Consultant a copy of the shipping document and weight receipt for every shipment of lead waste.

2. PART 2 - FACILITIES AND PRODUCTS

2.1 Equipment

2.1.1 Provide equipment that is suitable for intended use as specified by the proper standards. All equipment used on the project shall be clean and in good state of repair.

2.1.2 *Airless Sprayer:* Equipment used for the application of amended water to saturate asbestos-containing materials before removal.

2.1.3 *Electrical Components and Equipment:* supplied by the Contractor for performance of work on this project shall meet the requirements of the Canadian Standards Association (CSA) for use as installed.

2.1.4 *Electrical Power Cords:* Use single length power cords. If single length will not reach work area, use waterproof connectors to connect separate lengths. Use heavy duty cords in high traffic areas or in areas where abrasion of cords is expected. Only grounded electrical cords will be allowed.

2.1.5 *Ground Fault Panel:* use an electrical panel that is installed by a licensed electrician and is equipped with the following:

2.1.5.1 Ground fault circuit interrupts (breaker type) of sufficient capacity to supply all lights and equipment to be used in the work area.

2.1.5.2 Breakers shall have 5mA ground fault protection.

2.1.5.3 Main switch disconnect, test buttons and reset switches and circuit breaker lights.

2.1.5.4 Proper enclosure to prevent the penetration of moisture, dust and debris.

2.1.6 *Temporary Lighting:* Provide illumination as required in all work areas to perform the work safely and adequately. Illumination can be achieved by the use incandescent or fluorescent lamps. All lamps shall be protected by grounded guard cages or tempered glass enclosures.

2.1.7 *Fine Atomizing Spray Nozzle:* an airless sprayer nozzle that is designed to deliver no less than 1 gallon per minute of fine spray of water or lock-down agent.

2.1.8 *Flexible Ducting:* Tubing used for the exhaust of negative air units. The tubing is made up of plastic with metal reinforcement and is of a diameter that is equal to the exhaust port of a negative air unit.

2.1.9 *Garden Sprayer:* a metal or plastic pressure-can hand pump equipped with a hose and a metal wand. The pump is used to spray a fine mist of liquid on surfaces in a work area.

2.1.10 *Glove Bag:* The glove bag shall meet the following requirements if it will be used more than once:

2.1.10.1 Shall be a Safety-T-Strip trade product with a configuration suitable to fit the work at hand.

2.1.10.2 Shall have an internal ziplock feature for sealing the waste at the bottom of the bag.

2.1.10.3 Shall be secured around the material being removed using the securing device supplied with the bag. The securing device consists of a 1 inch reusable nylon straps with a metal tightening buckle for sealing the ends of the bag.

2.1.10.4 Shall be made of polyvinyl chloride (10 mil) minimum thickness with integral gloves and valve ports.

2.1.10.5 Shall be equipped with reversible double pull zipper with protective flaps to facilitate installation and progressive movement on pipes.

2.1.10.6 If it will not be used more than once, the glove bag shall meet the following requirements:

2.1.10.6.1 Shall be made of polyvinyl chloride or equivalent plastic bag with a minimum thickness of 6 mil.

2.1.10.6.2 Shall be equipped with two gloves projecting inward and valves for attaching a vacuum hose or a metal wand.

2.1.10.6.3 Shall have a pouch for storing tools and enough space to accommodate the storage of removed materials and to allow for proper sealing of the bag. The bag shall also be labelled with warning signs to identify the content of the bag.

2.1.11 *HEPA Filtered Negative Air Unit:* A portable air handling system which is used to create negative air pressure differential by the extracting the air directly from the work area and discharging it to the exterior of the area. The unit shall be equipped as follows: Fan, HEPA filter, pre-filters, pressure differential gauge, cabinet, high/low switch, on/off switch.

2.1.11.1 The fan shall have a capacity of 1500 cubic feet per minute. The fan shall be considered to have 80% of the rated of air flow unless tested and certified by a company specializing in such measurements and subject to the approval of the Consultant.

2.1.11.2 Each unit shall have a HEPA filter installed as a final filter in the unit. A tight seal shall be established between the filter and the filter housing through the use of a rubber gasket. Each filter shall be clearly marked with the serial number, direction of air flow, efficiency, air flow rating, name of manufacturer and resistance and shall bear UL586 label.

2.1.11.3 Each unit shall have an on/off switched located on the exterior of the cabinet. The unit shall also be equipped with overload protection and components such as cabinet, fan, motor, etc shall be grounded.

2.1.11.4 Each unit shall have a pressure differential gauge to monitor the filter loading and to indicate when the filters needs to be changed. The unit shall also have a time meter to indicate the total accumulated hours of operation.

2.1.11.5 Each unit shall have the following warning and safety devices: a means for preventing the unit from operating without a HEPA filter; auto shutoff system to stop the fan in case of HEPA filter failure such as rupture of the filter of blockage of air flow through the filter.

2.1.11.6 Provide units with pre and intermediate filters installed at the intake of the unit and secured in place with clamps or special filter housings. Two pre-filters are

required: the first pre-filter shall be of the low efficiency type and shall be 98% efficient for particles 100 microns and larger; the second pre-filter shall be of the medium efficiency type and shall be 95% efficient for particles down to 5 microns.

2.1.11.7 The cabinet of the unit shall be constructed of durable material able to withstand rough handling during removal work. The cabinet shall have wheels and shall be designed to allow access to the inside of the unit from the intake side for maintenance and replacement of filters. The unit shall be factory sealed to prevent the escape of dust and debris during transport and use.

2.1.12 *HEPA Vacuum:* A vacuum unit equipped with HEPA filter and designed so that all discharged air passes through the filter. Shall be equipped with all attachments, tools and fittings to facilitate the performance of the work.

2.1.13 *Pressure Differential Monitoring Unit:* An instrument designed to measure the difference in pressure between the interior and exterior of a work area. As a minimum, the instrument shall consist of the following: a continuous recoding wheel chart or tape; a gauge with a range from 0 to 0.1 inches water; sensor tubing and wall clamps; wall mounting devices, low limit and high limit audible alarm; and auto reset.

2.1.14 *Power Washer*: A piece of equipment capable of delivering an airless stream of liquid (water) at a pressure between 1200 and 2500 psi. Typically used for cleaning of work area surfaces and equipment and for saturating materials scheduled for removal before work start to reduce the creation of dust.

2.1.15 *Scaffolding*: Select, erect and use scaffolding in a manner that is in compliance with all applicable occupational health and safety regulations.

2.1.15.1 Types of scaffolding allowed consist of suspension or standing types such as cantilever, metal tube and coupler, pole or outrigger or tubular welded frame.

2.1.15.2 Provide non-skid surfaces and/or foot boards on all scaffolds where foot traffic is anticipated.

2.1.15.3 Provide an abrasive non-slip surfaces on rungs of metal ladders.

2.1.16 *Water Service Components and Equipment:* supplied by the Contractor for performance of work on this project shall be temperature and pressure rated for operation of the temperature and pressure encountered.

2.1.16.1 Hot water heater to be used for supplying water to the shower shall be:

2.1.16.1.1 ULC rated electric hot water heater.

2.1.16.1.2 Appropriately sized for the project.

2.1.16.1.3 Powered from the ground fault panel.

2.1.16.1.4 Equipped with a relief valve that is piped to a drip pan secured to the water heater.

2.1.16.2 Supply water to each working area and decontamination unit using pipes having a pressure rating greater than the pressure of the water distribution system. Provide fittings as necessary to allow connecting to existing systems and other temporary facilities.

2.1.16.3 The shower provided for the decontamination facility shall be of the walk through type. The shower pan shall be a waterproof, one piece pan constructed from stainless or galvanized steel with welded seams, copper or lead with soldered seams or fibreglass reinforced with wood. The shower head shall be adjustable for spray size and intensity. The shower shall be supplied with separate hot and cold water. The control for water temperature, flow and shut off shall be located inside the shower.

2.1.16.4 Multi-stage cascade filter units shall be provided on drain lines from any water source carrying asbestos-contaminated water from the work area including the shower. The units shall be provided with a primary and a secondary disposal filter elements. The primary filter shall allow the passage of particles that are 20 microns and smaller. The secondary shall allow the passage of particles that are 5 microns and smaller. The units shall be connected so that the water passes the primary filter first and the discharge of the primary filter passes through the secondary filter.

2.2 Materials

2.2.1 Materials destined for use on this project shall be undamaged, shall comply with the requirements of the contract and specifications and shall be unused at the time of installation unless otherwise indicated.

2.2.2 *Asbestos Waste Container:* An impermeable container that is dust-tight and impervious to asbestos waste. Shall be made of new material only and shall be labelled as required by applicable regulations with a pre-printed cautionary asbestos warning label. The container shall (depending on the nature of the waste material) be comprised of the following:

2.2.2.1 A 6 mil thick leak-tight polyethylene bag labelled as required and placed inside another 6 mil sealed polyethylene bag (in case the waste does not contain any sharp objects).

2.2.2.2 A 6 mil sealed polyethylene bag positioned inside or outside a heavy duty leak tight solid sealed container of sufficient strength to prevent perforation of the container during handling (in case the waste contains sharp objects).

2.2.3 *Caulking:* Acrylic polymer sealant that is non-staining.

2.2.4 *Drop Sheets:* Sheets made up of polyethylene of size and type appropriate to the work. To be placed under an area where work is being carried out.

2.2.5 *Encapsulant:* Type 1 penetrating Class A water based encapsulant conforming to CGSB 1-GP-205M and approved by the Fire Marshall and having a flame spread and smoke development ratings both less than fifty.

2.2.6 *Felts:* 1/16” thick and 36” to 72” wide non-coated, standard cellulose building felt.

2.2.7 *Rip-Proof (Fibre Re-enforced) Polyethylene Sheeting:* 8 mil fibre re-enforced fabric (bonded on both sides with polyethylene sheeting) made up from 5 mil weave and 2 layers of 1.5 mil poly laminate. Provide new material only in maximum size sheets (to fit work) to minimize joints.

2.2.8 *Fire Extinguisher:* Provide type "ABC" dry chemical fire extinguishers of a combination of extinguishers suitable for the type of exposure in each case.

2.2.9 *First Aid Supplies:* Provide and maintain first aid supplies on the project site as required by applicable regulations and construction industry recommendations.

2.2.10 *Flame Resistant Polyethylene Sheeting:* a layer of polyethylene sheeting that conforms to the requirements of the NFPA Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films. Provide new material only in 6 mil thickness and in maximum size sheets (to fit work) to minimize joints.

2.2.11 *Foam:* Polyurethane expanding foam of low density.

2.2.12 *Lock Down Sealant:* a clear, non-staining, water dispersible type, slow drying sealant that is used for the purpose of trapping residual dust. The sealer shall remain sticky on the surface for an 8 hour period as a minimum. The product shall have flame spread and smoke development ratings of less than 50 for both. The sealant shall be compatible with replacement insulation or fireproofing and shall be capable of withstanding service temperature of substrate.

2.2.13 *Polyethylene Sheeting:* A 6 mil minimum (unless otherwise specified) thickness polyethylene film in maximum sheet size to minimize seems and black, frosted or clear as required to meet specifications.

2.2.14 *Protective Coveralls:* Full body coveralls complete with hoods and shoe coverings, made up of a material which does not permit penetration of asbestos fibres and is disposable.

2.2.15 *Spray Cement:* Specifically formulated spray adhesive in spray cans devised to stick to polyethylene sheets.

2.2.16 *Tape:* 2" to 3" widths reinforced tape (cloth or fibreglass reinforced) appropriate for sealing polyethylene sheets under dry and wet conditions.

2.2.17 *Wetting Agent:* A mixture of water and a surfactant used for wetting asbestos-containing materials before removal to minimize the release of fibres during disturbance of the material.

2.3 Platforms

2.3.1 Work in certain areas of the project will require the use of platforms. Unless otherwise specified, work platforms for this project shall be erected as follows:

2.3.1.1 Set up a support structure of metal, wood or equivalent scaffolding above which the work platform will be positioned.

2.3.1.1.1 Place one layer of rip proof polyethylene sheeting over scaffold board.

2.3.1.1.2 Place one layer of plywood sheets over the rip proof poly and fasten in place using nails.

2.3.1.1.3 Ensure that the plywood is of sufficient thickness and is capable of supporting the weight of all personnel and equipment expected to be present on the platform. Comply with the requirements of applicable Occupational Health and Safety Acts and Regulations.

2.3.1.1.4 Prevent water leakage from the platform by taping and caulking the seams between the plywood sheets and by instating a minimum of two layers of rip proof poly over the plywood sheets.

2.3.1.1.5 Isolate the platform from the occupied areas through the use of plywood walls.

2.3.1.2 The bases of the support structure shall be adequately sized and rated to protect the floors. The Contractor shall be responsible for rectifying any damages caused by the support structure and the platform.

2.3.1.3 Ensure that the support structure is set up in a manner that will not interfere with activities that are regularly carried out in the space.

2.3.1.4 Ensure that the existing lighting levels are maintained under the platform by using temporary fluorescent light fixtures.

2.3.1.5 Install air tight and water tight escape hatches for every 500 square feet of platform. The hatches shall be designed to allow for quick egress from the work area in case of an emergency and shall be supplied with emergency lighting.

2.4 Decontamination Enclosure Systems

2.4.1 Decontamination enclosure systems shall be constructed before any other work commences. The decontamination systems shall include one system for workers decontamination and another system for equipment and waste decontamination.

2.4.2 Enclosure System for Worker Decontamination: This enclosure system shall consist of a clean room, a shower room and an equipment and access room.

2.4.2.1 *Clean Room*: A clean room shall be constructed between the clean occupied areas and the shower room. The clean room shall have:

2.4.2.1.1 A storage space for clean personal protective equipment.

2.4.2.1.2 Hangers, hooks and secures lockers for workers use and for safe storage of personal belongings.

2.4.2.1.3 A mirror to aid workers in fittings respiratory equipment before entry into the contaminated areas.

2.4.2.1.4 Airlocks on the shower side and the clean occupied area side.

2.4.2.1.5 A lockable wood door on the occupied area side to prevent unauthorized entry into the work areas.

2.4.2.1.6 An area of 100 square feet (minimum) or shall be based on a criteria of 10 square feet per worker, whichever is greater.

2.4.2.2 *Shower Room:* A shower room shall be constructed between the clean room and the equipment and access room. The shower room shall have:

2.4.2.2.1 A shower unit of the walk through type for every 8 workers.

2.4.2.2.2 Airlocks on the clean room side and the equipment and access room side.

2.4.2.2.3 Clean towels, soap and shampoo supplied by the Contractor for use by the workers.

2.4.2.2.4 A constant supply of hot and cold running water with individual controls within the shower units to regulate water temperature and flow rate.

2.4.2.2.5 Individual hot and cold shut-off valves with access from the clean room of the decontamination enclosure.

2.4.2.2.6 Containers for disposing of used respirator filters and hooks for hanging respirators located on the clean side of the shower.

2.4.2.2.7 Watertight piping and sealed drip pans.

2.4.2.2.8 Sump pumps for removing shower waste water. Pump the waste water through the filter systems specified before discharging into sanitary sewer drains.

2.4.2.2.9 Power switches and outlets that are ground fault protected. Sump pumps power switches shall be located on both sides of the shower unit.

2.4.2.3 *Equipment and Access Room:* An equipment and access room shall be constructed between the shower room and the contaminated work areas. The equipment and access room shall have:

2.4.2.3.1 Airlocks on the shower side and the contaminated area side.

2.4.2.3.2 An area of not less than 100 square feet to allow one worker enough space to undress comfortably.

2.4.2.3.3 Facilities for storing personal protective equipment and clothing which will be used again inside the contaminated areas.

2.4.3 Enclosure System for Equipment and Waste Decontamination: This enclosure system shall consist of a transfer room, a holding room and a cleaning room.

2.4.3.1 *Transfer Room:* A transfer room shall be constructed between the clean occupied areas and the holding room. The room shall have a lockable wood door on the occupied area side to prevent unauthorized entry into the work areas. It shall have airlocks on the clean occupied area side and the holding room side. The size of the transfer room should be large enough to facilitate double bagging of waste bags or to house the largest piece of equipment used.

2.4.3.2 *Holding Room:* A holding room shall be constructed between the transfer room and cleaning room. The room shall have airlocks on the transfer room side and the cleaning room side. The size of the transfer room should be large enough to facilitate double bagging of waste bags or to house the largest piece of equipment used inside the asbestos work areas.

2.4.3.3 *Cleaning Room:* A cleaning room shall be constructed between the holding room and the contaminated area. The room shall have airlocks on the holding room side and the contaminated area side. The size of the cleaning room should be large enough to facilitate washing and cleaning of waste bags, containers and equipment and for double bagging of waste bags.

2.4.3.4 This enclosure system shall not be used by workers exiting the contaminated area as a replacement for the workers decontamination enclosure system.

2.4.4 Construction of Decontamination Enclosure Systems: Enclosures shall be constructed using suitable framing to fit the area. Alternatively, exiting rooms can be used subject to the approval of the Consultant.

2.4.4.1 Use 2”x4” studs at 16” o/c to the construct the walls and ceilings frames. The interior side of the frame shall be covered by one layer of rip proof polyethylene sheeting.

2.4.4.2 Cover the exterior side of the frame located inside the contaminated area with plywood sheets. All plywood sheets joints shall be sealed with duct tape. Cover the plywood sheets with two independently sealed layers of rip proof polyethylene sheeting. Cover the exterior side of the frame which are not located inside the contaminated area or in an occupied area with 1 layer of rip proof polyethylene sheets. The exterior side of the frame located in an occupied area shall be covered with painted drywall sheets installed over one layer of rip proof polyethylene sheeting.

2.4.4.3 The floor of the decontamination enclosure system shall be protected with two independently sealed layers of rip proof poly sheets. The poly sheets used on the floor shall overlap with the poly sheets installed on the walls.

2.4.4.4 Separate the various rooms of the decontamination enclosure systems by curtained doorways constructed using two flap doors which are of the same dimensions as the openings. The flaps shall be made up of two layers of rip proof polyethylene sheets. Fasten the two sheets together and reinforce all edges with duct tape. The top and one side of each flap shall be secured to the enclosure frame. Attach a weight to the bottom of each of the flaps. Mark the opening between the two flaps using pieces of duct tape configured in the shape of a directional arrow.

3. PART 3 - EXECUTION

ASBESTOS

3.1 Type 1 Removal Operation

3.1.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.1.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.1.1.2 The Contractor is responsible for moving materials and objects which are present in the work areas.

3.1.1.3 Prevent the spread of dust from the work area using measures appropriate to the work to be done.

3.1.1.3.1 Shut off, lock out and seal all ventilation duct vents with the application of one layer of 6 mil (0.15mm) thick clear polyethylene sheet sealed with tape.

3.1.1.3.2 Use FR polyethylene drop sheets over all flooring in work areas where dust and contamination cannot otherwise be thoroughly cleaned. This does not apply if work involves the removal of asbestos-containing floor tiles.

3.1.1.3.3 Use one layer of 6 mil (0.15 mm) thick clear polyethylene sheets to cover walls.

3.1.1.3.4 Separate parts of the building required to remain in use from the work area by polyethylene drop sheets at the perimeter of the work area.

3.1.1.3.5 Separate the work area with clearly visible warning signs advising of the hazards of asbestos dust and that entry is restricted to authorized trained personnel wearing personal protective equipment.

3.1.1.3.6 Erect scaffolding or platforms where necessary to perform the removal work. All platforms that exceed 25 feet in height will require the submission of a shop drawing stamped by a professional engineer for approval by the inspector within a minimum of 5 days prior to commencing the work. Guard rails shall be provided around all platforms or scaffolding where practicable. Cover the floor area of the scaffold or platform with one layer of FR polyethylene. Extend the floor of scaffolding or platform under an item being removed to act as a receptacle. Polyethylene sheeting shall be suitably braced and/or restrained so that billowing or failure of the polyethylene sheeting or taped joints does not occur.

3.1.2 Entry and Exit Procedures from Asbestos Removal Work Areas: the following general procedures shall be adhered to when entering into and exiting from asbestos abatement work areas:

3.1.2.1 Work Area Entry Procedures:

3.1.2.1.1 Every worker and visitor planning to enter the work area should remove all street clothing and should store them in a designated clean change room.

3.1.2.1.2 The person shall then put on disposal coverall with head covering, respirators with clean filters and foot covering and shall proceed to the work area.

3.1.2.2 Work Area Exit Procedures:

3.1.2.2.1 Each worker shall decontaminate their protective clothing, boots and respirator by first HEPA vacuuming and then by damp wiping using soap and water.

3.1.2.2.2 The removed disposable coveralls shall be disposed of as asbestos waste in a 0.15 mm (6 mil) labelled waste bag. Respirator filter inlets shall be sealed in tape or disposed of as asbestos waste.

3.1.3 Asbestos Removal Procedures

3.1.3.1 Asbestos Removal shall not commence until:

3.1.3.1.1 The work area is effectively separated from clean areas of the building.

3.1.3.1.2 Warning signs are posted outside the removal work areas.

3.1.3.1.3 All surfaces which are not possible to clean are sealed with polyethylene sheeting and tape.

3.1.3.1.4 Arrangements have been made for waste disposal, landfill site operator has been contacted and storage bin is on site.

3.1.3.1.5 Tools equipment and materials are on hand and in the work area.

3.1.3.1.6 Facilities for the washing of hands and face are available for workers leaving the work area.

3.1.3.2 Before beginning work remove visible dust from surfaces in the work area where dust is likely to be disturbed during the course of the work. Use HEPA vacuum, or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate. Do not use compressed air to clean up or remove dust from any surface.

3.1.3.3 Wet materials containing asbestos to be cut, ground, abraded, drilled, or otherwise disturbed with amended water. Use garden type low velocity fine mist sprayer. Perform work in a manner to reduce dust creation to lowest levels practicable. Spray asbestos material repeatedly during the work process to minimize asbestos fibre release.

3.1.3.4 Additional cement board removal procedures.

3.1.3.4.1 Cement board shall be removed intact where possible.

3.1.3.4.2 When not possible to remove intact, the board shall be cut with hand saws where necessary and dust shall be collected with a HEPA vacuum cleaner nozzle held under the cut area.

3.1.3.4.3 Drop sheets shall be used no more than 0.5 metres below the cutting location and shall be constructed in such a manner that any dust not removed by the HEPA vacuum is collected.

3.1.3.5 Remove material in sections as intact as possible.

3.1.3.6 Frequently during the work and immediately after completion of the work, clean up dust and waste containing asbestos using a HEPA vacuum or by damp wiping.

3.1.4 Final Clean

3.1.4.1 When removal is complete, clean the entire work area by HEPA vacuuming and wet wiping.

3.1.4.2 The work area shall be deemed clean by the Inspector when there is no visible residue, dirt, film, stain, or discolouration resulting from either asbestos removal or cleaning activities.

3.1.4.3 After completion of the initial cleaning and after the Inspector has passed the visual inspection, spray sealant on all surfaces in the work area, including, but not limited to:

3.1.4.3.1 Where asbestos material has been removed.

3.1.4.3.2 Polyethylene sheeting used on walls, floors and ceilings.

3.1.4.4 Sealant should be sprayed using a garden reservoir type low velocity fine mist sprayer. The sprayer cannot be used if the nozzle is partially obstructed, or if a uniform fine mist spray cannot be obtained.

3.1.4.5 After the area is declared clean and written approval to proceed has been received from the Inspector:

3.1.4.5.1 Dismantle boundaries and isolating barriers as asbestos waste. Drop sheets shall be wetted and folded to contain dust and then placed in waste bags.

3.1.4.5.2 Immediately before their removal from the work area, and disposal, clean each filled labelled waste bag using damp cloths or HEPA vacuum and place in second clean clear polyethylene waste bag.

3.1.4.5.3 Dispose of waste as per procedures specified in subsection 1.14 Waste Transport and Disposal.

3.1.4.6 Repair or replace objects damaged in the course of the work. Re-establish objects moved to temporary locations in the course of the work, in their proper positions. Re-secure mounted objects removed in the course of the work in their former positions.

3.2 Type 2 Removal Operation: For Work In Enclosures

3.2.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.2.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.2.1.2 The Contractor is responsible for moving materials which are present in the work.

3.2.1.3 Prevent the spread of dust from the work area using measures appropriate to the work to be done.

3.2.1.3.1 Shut off, lock out and seal all ventilation duct vents with the application of one layer of 6 mil (0.15 mm) thick clear polyethylene sheet sealed with tape.

3.2.1.3.2 Clean all moveable objects within proposed work area using a HEPA vacuum.

3.2.1.3.3 Clean fixed casework, plant, and equipment within proposed work area, using a HEPA vacuum and cover with polyethylene sheeting sealed with tape.

3.2.1.3.4 Clean proposed work areas using, where practicable, HEPA vacuum cleaning equipment. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA filter-equipped vacuums.

3.2.1.3.5 Cover and seal airtight light fixtures, duct openings and other suspended ceiling objects using clear 6 mil polyethylene sheeting and tape.

3.2.1.3.6 Erect scaffolding or platforms necessary to perform the removal work. All platforms that exceed 25 feet in height will require the submission of a shop drawing stamped by a professional engineer for approval by the inspector within a minimum of 5 days prior to commencing the work. Guard rails shall be provided around all platforms or scaffolding where practicable.

3.2.1.3.7 Cover floor area of scaffold or platform with one layer of FR polyethylene.

3.2.1.3.8 Extend scaffolding or platform under the item being removed to prevent material from falling.

3.2.1.3.9 Separate parts of the building required to remain in use from the work area by polyethylene drop sheets at the perimeter of the work area.

3.2.1.3.10 Set up an airtight enclosure around the work area where the work on asbestos-containing material is to be carried out. Enclosure should be set up using 1 layer of FR polyethylene sheeting to cover the floors, and 1 layer of 6 mil (0.15 mm) thick clear polyethylene sheeting to cover the walls. Two layers of FR polyethylene sheeting should be used to cover carpeted floors. Polyethylene on the walls should be made to overlap with the polyethylene on the floor a minimum of 300 mm.

3.2.1.3.11 Polyethylene sheeting shall be suitably braced and/or restrained so that excessive billowing or failure of the polyethylene sheeting or taped joints does not occur as a result of the negative pressure differential created by the vacuums.

3.2.1.3.12 Erect a temporary structure made of wooden studs to support polyethylene sheeting where necessary.

3.2.1.3.13 Insert a hose of a HEPA filter equipped vacuum into the enclosure to provide negative air pressure inside the enclosure.

3.2.1.3.14 Entrance to the enclosure should be covered with two pieces of overlapping polyethylene sheeting.

3.2.1.3.15 Separate the work area with clearly visible warning signs advising of the hazards of asbestos dust and that entry is restricted to authorized trained personnel wearing personal protective equipment.

3.2.2 Entry and Exit Procedures from Asbestos Removal Work Areas: the following general procedures shall be adhered to when entering into and exiting from asbestos abatement work areas:

3.2.2.1 Work Area Entry Procedures:

3.2.2.1.1 Every worker and visitor planning to enter the work area should remove all street clothing and should store them in a designated clean change room.

3.2.2.1.2 The person shall then put on disposal coverall with head covering, respirators with clean filters and foot covering and shall proceed to the work area through the flaps covering the entrance to the enclosure.

3.2.2.2 Work Area Exit Procedures:

3.2.2.2.1 Each worker shall decontaminate their protective clothing, boots and respirator by first HEPA vacuuming and then by damp wiping using soap and water.

3.2.2.2.2 The removed disposable coveralls shall be disposed of as asbestos waste in a 0.15 mm (6 mil) labelled waste bag. Respirator filter inlets shall be sealed in tape or disposed of as asbestos waste.

3.2.3 Asbestos Removal Procedures

3.2.3.1 Asbestos Removal shall not commence until:

3.2.3.1.1 The work area is effectively separated from clean areas of the building.

3.2.3.1.2 Warning signs are posted outside the removal work areas.

3.2.3.1.3 All surfaces which are not possible to clean are sealed with polyethylene sheeting and tape.

3.2.3.1.4 Arrangements have been made for waste disposal, landfill site operator has been contacted and storage bin is on site.

3.2.3.1.5 Tools equipment and materials are on hand and in the work area.

3.2.3.1.6 Facilities for the washing of hands and face are available for workers leaving the work area.

3.2.3.2 Before beginning the work remove visible dust from surfaces in the work area. Use HEPA vacuum, or damp cloths where damp cleaning is considered more appropriate. Do not use compressed air to clean up or remove dust from any surface.

3.2.3.3 Wet materials containing asbestos to be removed, disturbed, or sealed with amended water. Garden reservoir type low velocity fine mist sprayer may be

used. Perform work in a manner to reduce dust creation to lowest levels practicable. Spray asbestos material repeatedly during the work process to minimize asbestos fibre dispersion.

3.2.3.4 Removed material has to be placed directly in waste bags. Wherever possible, asbestos-containing material should be removed in sections as intact as possible.

3.2.3.5 Areas that used to be covered with the asbestos-containing material should be cleaned after the material is removed, using brushes, steel wool, or any other tools suitable.

3.2.3.6 Frequently during the work and immediately after completion of the work, clean up dust and waste containing asbestos using a HEPA vacuum or by damp wiping.

3.2.3.7 All labelled waste bags should be placed in clean clear 6 mil poly bags before they are taken out of the enclosure.

3.2.4 Final Clean

3.2.4.1 When removal is complete, clean the entire work area by HEPA vacuuming and wet wiping.

3.2.4.2 All tools and equipment used in the removal process such as hook knives, extension cords, scrapers, wire brushes, garden sprayers etc, should be washed and cleaned and placed in 6 mil polyethylene bags.

3.2.4.3 The work area shall be deemed clean by the Inspector when there is no visible residue, dirt, film, stain, or discolouration resulting from either asbestos removal or cleaning activities.

3.2.4.4 After completion of the initial cleaning and after the Inspector has passed the visual inspection, spray sealant on all surfaces in the work area, including, but not limited to:

3.2.4.4.1 Where asbestos material has been removed.

3.2.4.4.2 Polyethylene sheeting used on walls, floors and ceilings.

3.2.4.5 Sealant should be sprayed using a garden reservoir type low velocity fine mist sprayer. The sprayer cannot be used if the nozzle is partially obstructed, or if a uniform fine mist spray cannot be obtained.

3.2.4.6 Enclosure should be left standing until all the sealant has dried or, if required, until an air sample is taken inside the enclosure, and the fibre concentration level is below 0.05f/cc.

3.2.4.7 After the area is declared clean and written approval to proceed has been received from the Inspector:

3.2.4.7.1 Dismantle boundaries and isolating barriers and treat as asbestos waste. Drop sheets shall be wetted and folded to contain dust and then placed in waste bags.

3.2.4.7.2 Immediately before their removal from the work area, and disposal, clean each filled labelled waste bag using damp cloths or HEPA vacuum and place in second clean clear polyethylene waste bag.

3.2.4.7.3 Dispose of waste as per procedures specified in subsection 1.14 Waste Transport and Disposal.

3.2.4.8 Repair or replace objects damaged in the course of the work. Re-establish objects moved to temporary locations in the course of the work, in their proper positions. Re-secure mounted objects removed in the course of the work in their former positions.

3.3 Type 2 Removal Operation: For Work Using Glove Bags

3.3.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.3.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.3.1.2 Prevent the spread of dust from the work area using measures appropriate to the work to be done.

3.3.1.2.1 Shut off, lock out and seal all ventilation duct vents with the application of one layer of 6 mil (0.15 mm) thick clear polyethylene sheet sealed with tape.

3.3.1.2.2 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over all flooring in work area where dust and contamination cannot otherwise be safely contained.

3.3.1.2.3 Separate parts of the building required to remain in use from the work area by polyethylene drop sheets around the perimeter of the work area.

3.3.1.2.4 Separate the work area with clearly visible warning signs advising of the hazards of asbestos dust and that entry is restricted to authorized trained personnel wearing personal protective equipment.

3.3.2 Worker Protection Procedures

3.3.2.1 Before proceeding to the work area:

3.3.2.1.1 Each worker shall don respirator and disposable coveralls, including head covering and suitable foot wear. Removal of street clothes in a designated clean room before wearing the disposable coveralls is recommended.

3.3.2.2 Before leaving the work area:

3.3.2.2.1 Each worker shall decontaminate their protective clothing, boots and respirator by first HEPA vacuuming and then by damp wiping using soap and water.

3.3.2.2.2 The removed disposable coveralls shall be disposed of as asbestos waste in a 6 mil (0.15 mm) labelled waste bag.

3.3.2.2.3 The worker shall proceed to clean their hands and arms. The waste water should be collected and filtered using a filter that passes particles 5 microns in size and smaller, before it is discharged into the municipal sewer system.

3.3.3 Asbestos Removal Procedures

3.3.3.1 Asbestos Removal shall not commence until:

3.3.3.1.1 The work area is effectively separated from clean areas of the building by polyethylene drop sheets and the placing of rope barriers at the boundary of the designated work area. The boundaries of the work area shall be a minimum of 10 feet from the location of the insulation being removed.

3.3.3.1.2 Warning signs are posted outside the removal work areas.

3.3.3.1.3 All surfaces which are not possible to clean are sealed with polyethylene sheeting and tape.

3.3.3.1.4 Arrangements have been made for waste disposal, landfill site has been contacted and storage bin is on site.

3.3.3.1.5 Tools equipment and materials are on hand and in the work area.

3.3.3.1.6 Facilities for the washing of hands and face are available for workers leaving the work area.

3.3.3.2 Before beginning work remove visible dust from surfaces in the work area where dust is likely to be disturbed during the course of the work. Use HEPA vacuum, or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate. Do not use compressed air to clean up or remove dust from any surface.

3.3.3.3 Remove all obstructions from around pipe. Where access is required above plaster ceilings, provide sufficient openings to gain access.

3.3.3.4 Friable material containing asbestos to be removed or disturbed shall be thoroughly surface wetted before and during work unless wetting creates a hazard or causes damage. Use garden type low velocity fine mist sprayer. Sprayers that are partially clogged, or that does not produce uniformly fine mist will not be accepted. Perform work in a manner to reduce dust creation to lowest levels practicable.

3.3.3.5 Inspect all glove bags for defects before using. A defective bag shall not be used.

3.3.3.6 Ensure that the following tools are used:

3.3.3.6.1 Knife shall have a retractable blade.

3.3.3.6.2 Saw shall be a flexible wire type.

3.3.3.6.3 Brushes shall not have metal bristles.

3.3.3.7 After written authorization has been received from the Inspector to proceed perform the removal using the following procedures.

3.3.3.7.1 Place tools necessary to remove insulation, in tool pouch. Wrap the bag around pipe and close zippers. Seal bag to pipe with restraining nylon straps. Welds and folds of glove bag are to remain intact without modification to manufacturers design.

3.3.3.7.2 Place hands in gloves and use necessary tools to remove insulation. Cut or remove exterior insulation covering where applicable to expose asbestos pipe covering. Wet exposed pipe or duct covering with sufficient mixture to suppress any dust. Arrange insulation in bag to obtain full capacity of bag.

3.3.3.7.3 Insert nozzle of spray pump prefilled and primed with water and surfactant into bag through valve and wash down pipe and interior of bag thoroughly, use cloth or sponge to aid in washing process. Wet surface of insulation in lower section of bag.

3.3.3.7.4 Waste material in bags intended for use at more than one location and which are equipped with internal zippers to seal off waste, shall have the upper section of bag thoroughly cleaned then shall be sealed off in lower sections of bag before bag is removed from pipe. Reinstall bag in new location before opening zip lock.

3.3.3.7.5 If bag **(Only if bag is a Safe-T-Strip)** is to be moved along pipe, loosen straps, move bag, re seal to pipe using double pull zipper to pass hangers. Repeat stripping operation.

3.3.3.7.6 To remove bag after completion of stripping wash top section and tools thoroughly. Seal off waste in lower section of bag using zipper. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in water. Remove second strap and zipper. Fold over into appropriately labelled waste disposal bags and seal.

3.3.3.7.7 Prior to removal of bag ensure that pipe is free of all residue. Remove all residue using wet cloths as necessary. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow drying sealer to seal in any residual fibres.

3.3.3.7.8 Upon completion of work, cover exposed ends of remaining pipe insulation with polyethylene tape.

3.3.3.7.9 If the glove bag is ripped, cut or opened in any way, work that may disturb friable material shall cease immediately. If the rip, cut or opening is small and easy to repair then the glove bag shall be repaired forthwith with tape. Work may continue once the repairs are complete. If the rip, cut or opening is not small and cannot be easily repaired, place the glove bag forthwith in a suitable asbestos waste container. Any spilled material containing asbestos shall be cleaned up and removed by using a vacuum equipped with a HEPA filter.

3.3.3.8 All work will be subject to visual inspection and air monitoring. Any contamination of surrounding areas indicated by visual inspection or air monitoring will require the complete enclosure and clean up of affected areas.

3.3.4 Cleanup:

3.3.4.1 Frequently during the work and immediately after completion of the work clean up dust and waste containing asbestos using a HEPA vacuum or by damp mopping.

3.3.4.2 Place dust and waste containing asbestos in sealed dust tight waste bags. Drop sheets and disposable protective clothing shall be treated as asbestos waste and shall be wetted and folded inward to contain dust and then placed in waste bags.

3.3.4.3 Glove bags, disposal bags, drop sheets, cloth rags and any porous materials are to be considered as asbestos waste and handled according to disposal subsection.

3.3.4.4 Immediately before their removal from the work area, and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.

3.3.4.5 Seal and remove double bagged waste from site. Dispose of in accordance with procedures specified in section 1.15.

3.3.4.6 Perform final thorough cleanup of work areas and adjacent areas affected by the work using HEPA vacuums.

3.4 Type 3 Removal Operation

3.4.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.4.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.4.1.2 The Contractor is responsible for moving materials and objects which are present in the work areas.

3.4.1.3 Separate the asbestos removal work areas from other areas in the mechanical room required to remain in use as follows by erecting rip-proof polyethylene sheeting and plywood sheeting. The polyethylene sheeting should extend from floor to ceiling and the plywood hoarding should extend 8ft from the floor on the separation side of the enclosure. Use one layer of rip proof poly on the exterior side of the wood stud framing under the plywood sheets. Use two layers of poly on the interior side of the wood frame. The inner layer shall be made up of clear 6 mil poly sheets. The outer layers shall be made up of rip proof poly.

3.4.1.4 All surfaces, equipment and objects located in the work areas and not scheduled for removal shall be pre-cleaned by HEPA vacuuming or wet wiping and shall be protected by one layer of rip proof poly sheeting unless otherwise specified. Dry sweeping or vacuuming with units not equipped with HEPA filters shall not be allowed.

3.4.1.5 All equipment, objects and articles scheduled for removal shall be taken out of the work area only if its removal will not disturb any asbestos-containing materials.

3.4.1.6 Ensure that smoke detectors, fire alarms, heat detectors and other life safety equipment remain active and operating as installed.

3.4.1.7 All specified clean demolition work can be carried out before the Type 3 enclosure is set up on condition that the demolition work does not disturb any asbestos-containing materials.

3.4.1.8 Construct the decontamination enclosure systems for workers and for equipment and materials as specified.

3.4.1.9 Independently seal off all openings leading to the work area using polyethylene sheeting and duct tape. Such openings include, but are not limited to, windows, doorways, corridors, skylights, diffusers, grills and air ducts. Also seal all floor openings independently before covering the entire floor with polyethylene sheeting. Ensure that the individual seals are air tight and water tight.

3.4.1.10 Cover floors with two independently sealed layers of polyethylene sheeting and seal with duct tape. Poly on the floor shall extend a minimum of 30 cm up all vertical surfaces located in the work area.

3.4.1.11 Cover walls with one layer of 6 mil rip-proof polyethylene sheeting (unless specified otherwise). Overlap floor poly with wall poly by a minimum of 30 cm at each layer. The layers of wall poly shall always overlap the layers of the floor poly.

3.4.1.12 Ensure that adjoining sheets of poly used on walls and floors overlap by at least 30 cm.

3.4.1.13 Ensure that poly sheets are properly supported to avoid excessive billowing and failure of the enclosure as a result of applying negative pressure differential. Brace the poly in case of excessive billowing using 1”x2” straps.

3.4.1.14 Use flame resistant polyethylene sheeting near heat sources.

3.4.1.15 Create negative pressure in the work area using HEPA-filtered negative air unit distributed evenly (horizontally and vertically) within the work area. Supply any necessary platforms as required to elevate the negative air unit.

3.4.1.16 Provide enough negative air units to be able to exchange the air volume of the work area at least once every 20 minutes (three air changes per hour) and to maintain a minimum of 0.02” water gauge differential.

3.4.1.17 The pressure differential shall be continuously monitored using an automatic recorder as specified. Place the monitor outside the contaminated work area. A backup negative air unit shall be set up and ready for operation in case one of the original units fail.

3.4.1.18 Operate the negative air units from the start of the preparation and isolation phase until completion of the final clean up work and air testing.

3.4.1.19 Ensure that the necessary make up air is supplied to the work area through flaps installed in the perimeter seal.

3.4.1.20 Replace pre-filters and HEPA filters as necessary to maintain the proper flow rate and to ensure that the unit continues to function properly.

3.4.1.21 Contaminated air from the work area shall be exhausted directly to the outside through sealed ducts. Where necessary, remove existing windows and replace with a plywood panel. Secure panel in place and make weather tight using caulking. Install appropriately sized openings for exhaust (typically 12”). Replace windows upon completion of work.

3.4.1.22 All negative air units which are set up to discharge inside the building shall be leak tested in place using the DOP method.

3.4.1.23 The Contractor is allowed to connect to the owner’s existing water supply for use in the asbestos work areas and in the temporary shower and decontamination facilities. The Contractor shall be responsible for making all the connections using vacuum breakers and other backflow preventers.

3.4.1.24 The Contractor shall use copper pipes and fittings and high pressure hoses when making connections to the main water supply. The Contractor shall also install a main shut-off valve on the clean side of the decontamination enclosure. All connections shall be made down stream form the main shut-off valve. Ensure that the pressure in the temporary water distribution system is relieved if the system is to be left unattended. Ensure that no leaks are present around hose pipe connections. Minimize the possibility of water damage through spills or leaks by providing drip pans of suitable size and by ensuring that the drip pans are drained regularly.

3.4.1.25 Ensure that all water from the drainage facilities installed on the shower and other decontamination enclosures is passed through filtration systems as specified.

3.4.1.26 Test all temporary piping installed during this project and ensure that they are watertight. All temporary pipe installation shall remain water tight for the duration of the project. Pipes shall be installed parallel to walls and shall be temporarily secured to existing structures. Ensure that all piping is removed upon completion of work. Avoid damaging or altering the owner's existing water equipment and piping.

3.4.1.27 All electrical work shall be performed by a licensed electrician in compliance with all applicable regulations. Isolate, disconnect and lockout all power supplying or passing through the work area. Ensure that power supply to the remaining areas of the building is not disrupted during work in asbestos contaminated areas.

3.4.1.28 Unless specified, the use of the existing power and lighting circuits shall not be allowed. Use temporary electrical panels to provide power and lighting to the decontamination facilities and the work area. One electrical panel shall be provided for every 5000 square feet of contained asbestos work areas. Electrical panels shall be equipped and sized to handle all electrical equipment required for the completion of the project. The Contractor shall also be required to provide other additional electrical equipment such as temporary lighting, circuit breakers, panels, transformers and switch gears.

3.4.1.29 The contactor shall be responsible for establishing and maintaining fire and emergency exits from the work area that are acceptable to the Provincial Fire Marshall and other authorities having jurisdiction. The emergency exits shall be sealed in a manner that will not hinder the use of the doors during an evacuation and shall be clearly marked by using proper exit signs.

3.4.1.30 Battery powered emergency lighting shall be installed by the Contractor to provide general lighting throughout the work area in case of loss of power supply to the ground fault panel and to ensure that the emergency exits and the exit routes remain lit during the power failure.

3.4.1.31 Ensure that fire extinguishers are installed throughout the asbestos work area at each of the emergency exits and on both sides of the decontamination facilities. All fire extinguishers installed inside the work area shall be protected by clear polyethylene sheets and shall be easily accessible in case of an emergency.

3.4.1.32 The Contractor shall place warning signs at all access points leading to the contained work area. The signs shall be posted at the curtained doorways and shall read:

CAUTION
ASBESTOS HAZARD AREA
NO UNAUTHORIZED ENTRY
WEAR ASSIGNED PROTECTIVE EQUIPMENT
BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM

3.4.1.33 Once the initial clean preparation and isolation of the work area is completed, the Contractor shall request an inspection from the Consultant before proceeding to next phase. Notify the Consultant 24 hours before the inspection is needed.

3.4.1.34 Once authorization is obtained from the Consultant, proceed to setting up critical seals that might become accessible once removal operations commence.

3.4.1.35 Shut off and lock out the HVAC system serving the subject work area. Ensure that all work requiring the complete shutdown of the HVAC system is carried out during the time when the building is not occupied.

3.4.1.36 Unless otherwise specified, all electrical systems scheduled to remain inside the work area during asbestos removal activities shall be sealed using duct tape and poly sheets. Examples of such systems include speakers, wiring, smoke and heat detectors, alarm equipment, communication systems, PA systems, junction boxes, etc.

3.4.1.37 Once all the preparation work is complete, the contactor shall ensure that the work area is maintained neat and organized. All the enclosures shall be inspected by the supervisor before and after the completion of each work shift to ensure that the hoarding walls, polyethylene barriers and enclosures are intact. Any damaged discovered during the inspection shall be repaired immediately. Maintain an inspection log book on site to document when (date and time) the inspection was carried out and by whom (name and signature of the person). Summarize any problems encountered during the inspection.

3.4.1.38 Ensure that the negative air units and the associated ducting and exhaust openings are regularly inspected during the work shift. The pressure differential monitoring unit shall be also inspected regularly during the work shift to ensure that the specified negative pressure inside the work area is maintained.

3.4.2 Entry and Exit Procedures from Asbestos Removal Work Areas: the following general procedures shall be adhered to when entering into and exiting from asbestos abatement work areas:

3.4.2.1 *Work Area Entry Procedures:*

3.4.2.1.1 Every worker and visitor planning to enter the work area shall remove all street clothing including undergarments and shall store them in the clean change room.

3.4.2.1.2 All uncontaminated articles such as clothing, footwear, towels, personal effects, etc. shall be store in the clean room of the decontamination facility.

3.4.2.1.3 The person shall then put on disposal coverall with head covering, respirators with clean filters and foot covering and shall proceed to the work areas through the shower and then the equipment and access room.

3.4.2.2 *Work Area Exit Procedures:*

3.4.2.2.1 Using HEPA vacuuming or wet wiping, remove all gross contamination from personal protective equipment (disposable coveralls, boots, hard hats, safety glasses, exterior of respirator, etc.) in the work area and then proceed to the equipment and access room.

3.4.2.2.2 In the equipment and access room, remove all protective clothing except the respirator and proceed to the shower. All disposal contaminated clothing shall be placed in asbestos disposal bags. Reusable items shall be stored neatly in the equipment and access room for use during the next shift.

3.4.2.2.3 Proceed naked to the shower while still wearing the respirator. While showering, clean the outside of the respirator with soap and water. Seal the openings in the filter as per the manufacturer's instruction or using duct tape. Alternatively, the filters can be disposed of as asbestos waste. Continue showering by thoroughly wetting and washing the body and the head. Wet and clean the inside of the respirator. Filters shall not be allowed in the clean room if not properly sealed.

3.4.2.2.4 Upon completion of showering and drying off, proceed to the clean room and dress in street clothing.

3.4.3 Asbestos Removal Procedures

3.4.3.1 Asbestos removal work shall not commence until the following requirements have been met:

3.4.3.2 All work areas have been and contained as specified, decontamination enclosure systems have been set up and occupied areas of the building have been properly isolated.

3.4.3.2.1 All required notifications have been made and a notice of project has been posted in a visible area.

3.4.3.2.2 Warnings signs have been displayed at all potential access points into the work area.

3.4.3.2.3 All arrangements have been made with the waste disposal facility.

3.4.3.2.4 All equipment, materials and tools needed inside the work area are available and in working condition.

3.4.3.2.5 Appropriate negative pressure differential have been established inside the work area with proper allowance for makeup air.

3.4.3.2.6 All building security arrangements have been made.

3.4.3.2.7 Written authorization has been obtained from the Consultant to commence asbestos removal work.

3.4.3.3 Using an airless sprayer, spray the asbestos-containing material with water mixed with a wetting agent. Apply enough amended water to ensure that the material is wet all way through to the substrate. Avoid dripping. Etch the surface of the material being wetted in cases were the water does not penetrate the outer layer of the material.

3.4.3.4 Remove the wet asbestos-containing materials in layers and/or small sections while maintaining exposed surfaces of insulation in a wet condition. Spray the material regularly throughout the removal work to maintain saturation and to minimize the generation and dispersion of dust. Ensure that the wet material does not dry out.

3.4.3.5 Ensure that the removed material and other waste generated during the removal process is collected and bagged immediately. Place the material in yellow labelled bags. Ensure that the waste water is also collected regularly. Avoid pooling of water. Dispose of the waste water in labelled 6 mil polyethylene bags (or other suitable rigid containers) or pump it straight into the sanitary sewer after passing it

through the specified two stage filters. Refer to Section 3.3.4 for specific procedures for handling of materials and waste.

3.4.3.6 Mist the air during the removal process using an airless sprayer capable of producing a fine mist and amended water to keep the airborne fibres levels as low as possible. Monitor the air inside the work area during removal. Airborne fibre levels in excess of 2.5 fibres/cc require the utilization of more airless sprayers.

3.4.3.7 Remove deck mounted objects and other obstructions as necessary to facilitate the removal of the asbestos-containing materials. Ensure that the removal work includes all asbestos-contaminated materials specified for removal.

3.4.3.8 After completion of gross asbestos removal work, perform a more thorough cleaning of all surfaces that used to be covered by asbestos to remove all visible residue and fibrous materials. Cleaning shall be carried out using wire brushing (stiff bristle brushes such as nylon or fibre bristles not metal), wet sponging and vacuuming. Ensure that the surfaces remain wet during the performance of this work.

3.4.3.9 Notify the Consultant in cases where asbestos-containing materials is encountered which cannot be properly removed without demolishing building structural members or removing major service elements. The Consultant will advise the Contractor in writing regarding the next course of action. If sealing the material in place is the recommended course of action, apply a penetrating sealer onto the material and ensure that it penetrates all the way to the substrate.

3.4.3.10 Continue with the wet thorough cleaning activities and include other surfaces in the work area including, but not limited to, decontamination facilities, polyethylene sheeting, walls and floor surfaces, equipment, containers, piping, ducts, conduits and poly surfaces used in the equipment and access room and the equipment decontamination facilities. Pre-filters used on the negative air units shall be removed and shall be disposed of as asbestos waste.

3.4.3.11 Request a visual clearance inspection by the Consultant once all the cleaning activities are completed. The level of cleanliness shall be acceptable to the Consultant before a written authorization is issued to apply the lock-down material.

3.4.4 Procedures for Handling of Materials and Waste

3.4.4.1 Seal all filled asbestos waste containers and clean the exterior of the containers and other items by wet sponging. Move the containers from the filling area to a temporary storage area located within the enclosure and close to the equipment waste decontamination facility.

3.4.4.2 Move the item to the container cleaning room, clean by wet sponges and pass it through the curtained doorway to a second worker stationed in the holding room. The second worker shall be fully protected (similar to the removal workers) and can only leave by going through the work area and exiting through the worker decontamination facility (after taking a shower). The second worker shall then clean or double bag and seal the item and shall pass it through the curtained doorway to a third worker stationed in the transfer room. The third worker enters the transfer room from the clean side and does not need to use personal protective

equipment. The third worker is then responsible for transferring the item to the disposal bin or to the Contractor's temporary storage room or truck.

3.4.4.3 All waste generated within the asbestos work area shall be treated as asbestos-contaminated waste and shall be disposed of accordingly. Non-porous materials which can be properly washed and cleaned can be disposed of as normal waste after cleaning.

3.4.4.4 The contactor shall use a combination of a rigid container with 6 mil poly bag to transport and dispose of waste containing sharp materials which could rip two 6 mil poly bag.

3.4.4.5 Transportation of waste and materials through occupied areas of the building shall be limited to a time when the building is not occupied. The Contractor shall use covered carts to transport the waste inside the building. Predetermined transport routes shall be approved by the Consultant. Workers transporting the waste shall be equipped with spill kits and full personal protective equipment and shall be trained to contain and clean any spilled asbestos-containing materials resulting from a failure in the waste containers.

3.4.4.6 Ensure that waste transport routes, loading areas and garbage bin storage areas are kept clean at all times. Garbage bins shall be of the fully enclosed type and shall be locked at all times when not in use. Garbage bins shall be placed only in locations specified and approved by the Owner or their representative.

3.4.4.7 Schedule garbage bin pick up and drop off times in consultation with the Consultant and ensure that the scheduled times do not interfere with the operations of the building Owner of their tenants.

3.4.4.8 Transport and dispose of asbestos waste as specified in Section 1.15

3.4.5 Procedures for Locking-Down of Work Area

3.4.5.1 Upon completion of clean up operations and after receiving written authorization from the Consultant to proceed, apply a lock-down agent acceptable to the Consultant on all surfaces in the work area such as areas where asbestos materials has been removed, pipes, ducts and other exposed objects present in the work area, polyethylene sheeting and other exposed walls, ceilings and floors, etc. Ensure that the sprayed material covers all surfaces. Apply twice as much lock-agent on areas that used to be covered by asbestos-containing materials.

3.4.5.2 Ensure that proper respiratory protective equipment is used during the application of the lock-down agent since, depending on the nature of the sealer used, potentially hazardous materials could be generated during the application process.

3.4.5.3 Restrict access to the work area for a period of 24 hours after completion of the lock-down application to allow for the dust to settle and for the lock-down agent to dry off. Clearance air samples will then collected inside the work area.

3.4.5.4 The work area shall be considered acceptable for public occupancy only if the airborne fibre levels inside the work area are less than 0.01 fibres/cc. Levels above 0.01 fibres/cc requires that the entire area be re-cleaned and another coat of lock-down agent be applied by the Contractor on all surfaces in the work area.

Re-sampling will be carried out and the entire process shall be repeated until the fibres levels are less than 0.01 fibres/cc.

3.4.5.5 The Contractor shall be responsible for all charges associated with re-cleaning work and other associated requirements as specified.

3.4.6 Procedures for Work Area Teardown and Dismantling

3.4.6.1 Proceed with the teardown of the work area only after obtaining written authorization from the Consultant. Ensure that Type 3 procedures remain in effect during this phase of work. The worker and equipment and material decontamination units shall remain fully operational. The negative air units shall continue to operate throughout the duration of the teardown work.

3.4.6.2 Start by removing polyethylene sheeting by carefully folding it away from the walls to the centre of the work area making sure that any loose debris is trapped within the poly. Also remove all enclosures, duct tape, caulking, polyurethane foam and other materials used in setting up the enclosure. Ensure that one layer of polyethylene sheeting is kept in place in situations were re-application of fireproofing is required. Polyethylene and other materials used in setting up enclosures shall be disposed of as asbestos-contaminated waste.

3.4.6.3 Clean all vacuum units, fittings, hoses and other small tools used during the removal work inside the work area, seal in 6 mil poly bags and remove from the work area through the equipment and materials decontamination unit. Wash down and clean other equipment used during the work and remove from the work area.

3.4.6.4 Clean up the asbestos work area including all surfaces and all decontamination enclosures. Remove negative air units pre-filters and dispose of as asbestos waste. Seal the exterior of the unit on all sides with poly and remove from the work area.

3.4.6.5 Remove all waste bags containing polyethylene sheets and other materials used to set up the enclosures and dispose of as specified.

3.4.6.6 Remove all hoarding walls separating the work area from occupied areas except in locations where the walls are set up adjacent to other areas that still contain asbestos. Obtain approval of Consultant before dismantling hoarding walls.

3.4.6.7 Dismantle the remainder of the enclosure including scaffolding, platforms, decontamination facilities, tunnels, etc. Final clean the work area using HEPA vacuuming and wet wiping. Clean and remove all ground fault panels and temporary lighting.

3.4.7 Procedures for Re-Establishment of Objects and Systems

3.4.7.1 Re-establish mechanical and HVAC systems and install new clean air filters where previously removed. Re-establish all electrical system and return to as found condition unless otherwise specified.

3.4.7.2 Repair, replace and make good on all damages not identified during the per-removal survey.

3.4.7.3 Unless otherwise specified, all items and objects removed during the initial preparation phase of the work shall be returned to their original position and shall be properly mounted and secured.

MOULD

3.5 Level I: Remediation of Small-Scale Mould Growth (Less than 1 m²)

3.5.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.5.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.5.1.2 The Contractor is not responsible for moving materials and objects which are present in the work areas and which are not likely to disturb mould contaminated materials. This work will carried out by other.

3.5.1.3 Prevent the spread of dust from the work area using measures appropriate to the work to be done.

3.5.1.3.1 Shut off, lock out and seal all ventilation duct vents with the application of one layer of 6 mil (0.15mm) thick clear polyethylene sheet sealed with tape.

3.5.1.3.2 Use FR polyethylene drop sheets over all flooring in work areas where dust and contamination cannot otherwise be thoroughly cleaned. This does not apply if work involves the removal of mould contaminated carpets and floor coverings.

3.5.1.3.3 Separate parts of the building required to remain in use from the work area by polyethylene drop sheets at the perimeter of the work area.

3.5.1.3.4 Separate the work area with clearly visible warning signs advising of the hazards of mould and that entry is restricted to authorized trained personnel wearing personal protective equipment.

3.5.1.3.5 Erect scaffolding or platforms where necessary to perform the removal and clean up work. All platforms that exceed 25 feet in height will require the submission of a shop drawing stamped by a professional engineer for approval by the inspector within a minimum of 5 days prior to commencing the work. Guard rails shall be provided around all platforms or scaffolding where practicable. Cover the floor area of the scaffold or platform with one layer of FR polyethylene. Extend the floor of scaffolding or platform under an item being removed to act as a receptacle. Polyethylene sheeting shall be suitably braced and/or restrained so that failure of the polyethylene sheeting or taped joints does not occur.

3.5.2 Entry and Exit Procedures from Mould Removal and Clean Up Work Areas: the following general procedures shall be adhered to when entering into and exiting from mould abatement work areas:

3.5.2.1 Work Area Entry Procedures:

3.5.2.1.1 Every worker and visitor planning to enter the work area should remove all street clothing and should store them in a designated clean change room. Although not recommended, workers are allowed to wear disposable coveralls over their street cloths.

3.5.2.1.2 The person shall then put on disposal coverall with head covering, respirators with clean filters and foot covering and shall proceed to the work area.

3.5.2.2 Work Area Exit Procedures:

3.5.2.2.1 Each worker shall decontaminate their protective clothing, boots and respirator by first HEPA vacuuming and then by damp wiping using soap and water.

3.5.2.2.2 The removed disposable coveralls shall be disposed of as mould contaminated waste in a 0.15 mm (6 mil) labelled waste bag. Respirator filter inlets shall be sealed in tape or disposed of as mould contaminated waste.

3.5.3 Mould Removal and Clean Up Procedures

3.5.3.1 Mould removal and clean up shall not commence until:

3.5.3.1.1 The work area is effectively separated from clean areas of the building.

3.5.3.1.2 Warning signs are posted outside the work areas.

3.5.3.1.3 All surfaces which are not possible to clean are sealed with polyethylene sheeting and tape.

3.5.3.1.4 Arrangements have been made for waste disposal, landfill site operator has been contacted and storage bin is on site.

3.5.3.1.5 Tools equipment and materials are on hand and in the work area.

3.5.3.1.6 Facilities for the washing of hands and face are available for workers leaving the work area.

3.5.3.2 Before beginning work remove visible dust from surfaces in the work area where dust is likely to be disturbed during the course of the work. Use HEPA vacuum, or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate. Do not use compressed air to clean up or remove dust from any surface.

3.5.3.3 Mist materials contaminated with mould to be cut, ground, abraded, drilled, or otherwise disturbed with water. Use garden type low velocity fine mist sprayer. Perform work in a manner to reduce dust creation to lowest levels practicable.

3.5.3.4 Additional contaminated drywall removal procedures:

3.5.3.4.1 Contaminated drywall board shall be removed intact where possible.

3.5.3.4.2 When not possible to remove intact, the board shall be cut with hand saws where necessary and dust shall be collected with a HEPA vacuum cleaner nozzle held under the cut area.

3.5.3.4.3 Drop sheets shall be used no more than 0.5 metres below the cutting location and shall be constructed in such a manner that any dust not removed by the HEPA vacuum is collected.

3.5.3.5 Remove material in sections as intact as possible.

3.5.3.6 Frequently during the work and immediately after completion of the work, clean up dust and waste contaminated with mould using a HEPA vacuum or by damp wiping.

3.5.4 Final Clean

3.5.4.1 When removal is complete, clean the entire work area by HEPA vacuuming and damp wiping using a Trisodium Phosphate (TSP) solution or equivalent. Apply the

TSP solution onto the surfaces for a minimum of 15 minutes. Wipe clean using clothes and clean water.

3.5.4.2 The work area shall be deemed clean by the Inspector when there is no visible residue, dirt, film, stain, or discolouration resulting from either mould removal or cleaning activities.

3.5.4.3 After completion of the initial cleaning and after the Inspector has passed the visual inspection, the area will be declared clean and written approval to proceed will be issued by the Inspector. At that point, the following shall be done:

3.5.4.3.1 Dismantle boundaries and isolating barriers and treat as mould waste. Drop sheets shall be wetted and folded to contain dust and then placed in waste bags.

3.5.4.3.2 Immediately before their removal from the work area, and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean clear polyethylene waste bag.

3.5.4.3.3 Dispose of waste as per procedures specified in subsection 1.14 Waste Transport and Disposal.

3.5.4.4 Repair or replace objects damaged in the course of the work. Re-establish objects moved to temporary locations in the course of the work, in their proper positions. Re-secure mounted objects removed in the course of the work in their former positions.

3.6 Level II: Remediation of Medium-Scale Mould Growth (Areas between 1 m²– 10 m²)

3.6.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.6.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.6.1.2 The Contractor is not responsible for moving materials which are present in the work areas and which are not likely to disturb mould contaminated materials. This work will carried out by other.

3.6.1.3 Prevent the spread of dust from the work area using measures appropriate to the work to be done.

3.6.1.3.1 Shut off, lock out and seal all ventilation duct vents with the application of one layer of 6 mil (0.15 mm) thick clear polyethylene sheet sealed with tape.

3.6.1.3.2 Clean all moveable objects within proposed work area using a HEPA vacuum.

3.6.1.3.3 Clean fixed casework and equipment within proposed work area, using a HEPA vacuum and cover with polyethylene sheeting sealed with tape.

3.6.1.3.4 Clean proposed work areas using, where practicable, HEPA vacuum cleaning equipment. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA filter-equipped vacuums.

3.6.1.3.5 Cover and seal airtight light fixtures, duct openings and other suspended ceiling objects using clear 6 mil polyethylene sheeting and tape.

3.6.1.3.6 Erect scaffolding or platforms necessary to perform the removal work. All platforms that exceed 25 feet in height will require the submission of a shop drawing stamped by a professional engineer for approval by the inspector within a minimum of 5 days prior to commencing the work. Guard rails shall be provided around all platforms or scaffolding where practicable.

3.6.1.3.7 Cover floor area of scaffold or platform with one layer of FR polyethylene.

3.6.1.3.8 Extend scaffolding or platform under the item being removed to prevent material from falling.

3.6.1.3.9 Separate parts of the building required to remain in use from the work area by polyethylene drop sheets at the perimeter of the work area.

3.6.1.3.10 Set up an airtight enclosure around the work area where removal and clean up of mould contaminated materials is to be carried out. The enclosure should be set up using 1 layer of FR polyethylene sheeting to cover the floors, and 1 layer of 6 mil (0.15 mm) thick clear polyethylene sheeting to cover the walls. Two layers of FR polyethylene sheeting should be used to cover carpeted floors. Polyethylene on the walls should be made to overlap with the polyethylene on the floor a minimum of 300 mm.

3.6.1.3.11 Polyethylene sheeting shall be suitably braced and/or restrained so that excessive billowing or failure of the polyethylene sheeting or taped joints does not occur as a

result of the negative pressure differential created by the vacuums or the negative air unit (s).

3.6.1.3.12 Erect a temporary structure made of wooden studs to support polyethylene sheeting where necessary.

3.6.1.3.13 Insert a hose of a HEPA filter equipped vacuum into the enclosure to provide negative air pressure inside the enclosure. Alternatively, a negative air unit can be used if site conditions allow the use of such equipment.

3.6.1.3.14 Entrance to the enclosure should be covered with two pieces of overlapping polyethylene sheeting.

3.6.1.3.15 Separate the work area with clearly visible warning signs advising of the hazards of mould and that entry is restricted to authorized trained personnel wearing personal protective equipment.

3.6.2 Entry and Exit Procedures from Mould Abatement Work Areas: the following general procedures shall be adhered to when entering into and exiting from mould removal and cleaning work areas:

3.6.2.1 Work Area Entry Procedures:

3.6.2.1.1 Every worker and visitor planning to enter the work area should remove all street clothing and should store them in a designated clean change room. Although not recommended, workers are allowed to wear disposable coveralls over their street cloths.

3.6.2.1.2 The person shall then put on disposal coverall with head covering, respirators with clean filters and foot covering and shall proceed to the work area through the flaps covering the entrance to the enclosure.

3.6.2.2 Work Area Exit Procedures:

3.6.2.2.1 Each worker shall decontaminate their protective clothing, boots and respirator by first HEPA vacuuming and then by damp wiping using soap and water.

3.6.2.2.2 The removed disposable coveralls shall be disposed of as mould contaminated waste in a 0.15 mm (6 mil) labelled waste bag. Respirator filter inlets shall be sealed with tape or disposed of as mould contaminated waste.

3.6.3 Mould Removal and Clean Up Procedures

3.6.3.1 Mould removal and clean up shall not commence until:

3.6.3.1.1 The work area is effectively separated from clean areas of the building.

3.6.3.1.2 Warning signs are posted outside the removal work areas.

3.6.3.1.3 All surfaces which are not possible to clean are sealed with polyethylene sheeting and tape.

3.6.3.1.4 Arrangements have been made for waste disposal, landfill site operator has been contacted and storage bin is on site.

3.6.3.1.5 Tools equipment and materials are on hand and in the work area.

3.6.3.1.6 Facilities for the washing of hands and face are available for workers leaving the work area.

3.6.3.2 Before beginning the work remove visible dust from surfaces in the work area. Use HEPA vacuum, or damp cloths where damp cleaning is considered more appropriate. Do not use compressed air to clean up or remove dust from any surface.

3.6.3.3 Ensure that all drywall mounted objects are properly supported to avoid creating any hazards once the drywall has been removed.

3.6.3.4 Mist mould contaminated materials to be removed or disturbed with water. Garden reservoir type low velocity fine mist sprayer may be used. Perform work in a manner to reduce dust creation to lowest levels practicable.

3.6.3.5 Removed material has to be placed directly in waste bags. Wherever possible, mould contaminated materials should be removed in sections as intact as possible.

3.6.3.6 Areas that used to be covered with mould contaminated materials should be cleaned after the material is removed, using brushes, steel wool, or any other tools suitable.

3.6.3.7 Frequently during the work and immediately after completion of the work, clean up dust and mould contaminated using a HEPA vacuum or by damp wiping.

3.6.3.8 All waste bags should be placed in clean clear 6 mil poly bags before they are taken out of the enclosure.

3.6.4 Final Clean

3.6.4.1 When removal is complete, clean the entire work area by HEPA vacuuming and damp wiping using a detergent solution.

3.6.4.2 All tools and equipment used in the removal process such as hook knives, extension cords, scrapers, wire brushes, garden sprayers etc, should be washed and cleaned and placed in 6 mil polyethylene bags.

3.6.4.3 The work area shall be deemed clean by the Inspector when there is no visible residue, dirt, film, stain, or discolouration resulting from either mould contamination removal or cleaning activities.

3.6.4.4 After the area is declared clean and written approval to proceed has been received from the Inspector:

3.6.4.4.1 Dismantle boundaries and isolating barriers and treat as mould contaminated waste. Drop sheets shall be wetted and folded to contain dust and then placed in waste bags.

3.6.4.4.2 Immediately before their removal from the work area, and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean clear polyethylene waste bag.

3.6.4.4.3 Dispose of waste as per procedures specified in subsection 1.14 Waste Transport and Disposal.

3.6.4.5 Repair or replace objects damaged in the course of the work. Re-establish objects moved to temporary locations in the course of the work, in their proper positions. Re-secure mounted objects removed in the course of the work in their former positions.

3.7 Level III: Remediation of Large-Scale Mould Growth (Areas greater than 10 m²)

3.7.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.7.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.7.1.2 The Contractor is not responsible for moving materials and objects which are present in the work areas and which are not likely to disturb mould contaminated materials. This work will carried out by other.

3.7.1.3 Separate the mould abatement work areas from other areas in the building required to remain in use by erecting floor to ceiling hoarding walls constructed of wood stud frames, plywood sheets and polyethylene sheeting. All joints formed between plywood sheets and between plywood sheets and other objects and building components shall be sealed air tight using a surface film forming type sealer and duct tape. Seal both edges of hoarding walls with caulking around fixtures and at walls and floors.

3.7.1.4 Use two (2) layers of poly on the interior side of the wood frame. The inner layer shall be made up of clear 6 mil poly sheets. The outer layers shall be made up of rip proof poly. Use one (1) layer of rip proof poly to protect existing walls.

3.7.1.5 Poly on the walls shall be made to overlap with poly on the floor by a minimum of 30 cm. Ensure that multiple poly layers on walls and floors are independently sealed.

3.7.1.6 All surfaces, equipment and objects located in the work areas and not scheduled for removal shall be pre-cleaned by HEPA vacuuming or wet wiping and shall be protected by one layer of rip proof poly sheeting unless otherwise specified. Dry sweeping or vacuuming with units not equipped with HEPA filters shall not be allowed.

3.7.1.7 All equipment, objects and articles scheduled for removal shall be taken out of the work area only if its removal will not disturb any mould contaminated materials.

3.7.1.8 Ensure that smoke detectors, fire alarms, heat detectors and other life safety equipment remain active and operating as installed.

3.7.1.9 Construct the decontamination enclosure systems for workers and for equipment and materials as specified.

3.7.1.10 Build tunnels and platforms in all locations in the work areas as specified and seal properly.

3.7.1.11 Independently seal off all openings leading to the work area and located below the false ceiling using polyethylene sheeting and duct tape. Such openings include, but are not limited to, windows, doorways, corridors, skylights, diffusers, grills and air ducts. Also seal all floor openings independently before covering the entire floor with polyethylene sheeting. Ensure that the individual seals are air tight and water tight.

3.7.1.12 Ensure that adjoining sheets of poly used on walls and floors overlap by at least 30 cm.

3.7.1.13 Ensure that poly sheets are properly supported to avoid excessive billowing and failure of the enclosure as a result of applying negative pressure differential. Brace the poly in case of excessive billowing using 1”x2” straps.

3.7.1.14 Use flame resistant polyethylene sheeting near heat sources.

3.7.1.15 Create negative pressure in the work area using HEPA-filtered negative air unit distributed evenly (horizontally and vertically) within the work area. Supply any necessary platforms as required to elevate the negative air unit.

3.7.1.16 Provide enough negative air units to be able to exchange the air volume of the work area at least once every 20 minutes (three air changes per hour) and to maintain a minimum of 0.03” water gauge differential. The pressure differential shall be continuously monitored using an automatic recorder as specified. Place the monitor outside the contaminated work area. A backup negative air unit shall be set up and ready for operation in case one of the original units fail.

3.7.1.17 Operate the negative air units from the start of the preparation and isolation phase until completion of the final clean up work and air testing.

3.7.1.18 Ensure that the necessary make up air is supplied to the work area through flaps installed in the perimeter seal.

3.7.1.19 Replace pre-filters and HEPA filters as necessary to maintain the proper flow rate and to ensure that the unit continues to function properly.

3.7.1.20 Contaminated air from the work area shall be exhausted directly to the outside through sealed ducts. Where necessary, remove existing windows or doors and replace with a plywood panel. Secure panel in place and make weather tight using caulking. Install appropriately sized openings for exhaust (typically 12”). Replace windows or doors upon completion of work.

3.7.1.21 All negative air units which are set up to discharge inside the building shall be leak tested in place using the DOP method.

3.7.1.22 The Contractor is allowed to connect to the owner’s existing water supply for use in the mould abatement work areas and in the temporary shower and decontamination facilities. The Contractor shall be responsible for making all the connections using vacuum breakers and other backflow preventers.

3.7.1.23 The Contractor shall use copper pipes and fittings and high pressure hoses when making connections to the main water supply. The Contractor shall also install a main shut-off valve on the clean side of the decontamination enclosure. All connections shall be made down stream form the main shut-off valve. Ensure that the pressure in the temporary water distribution system is relieved if the system is to be left unattended. Ensure that no leaks are present around hose pipe connections. Minimize the possibility of water damage through spills or leaks by providing drip pans of suitable size and by ensuring that the drip pans are drained regularly.

3.7.1.24 Ensure that all water from the drainage facilities installed on the shower and other decontamination enclosures is passed through filtration systems as specified.

3.7.1.25 Test all temporary piping installed during this project and ensure that they are watertight. All temporary pipe installation shall remain water tight for the duration of the project. Pipes shall be installed parallel to walls and shall be temporarily secured to existing structures. Ensure that all piping is removed upon completion of work. Avoid damaging or altering the owner's existing water equipment and piping.

3.7.1.26 All electrical work shall be performed by a licensed electrician in compliance with all applicable regulations. Isolate, disconnect and lockout all power supplying or passing through the work area. Ensure that power supply to the remaining areas of the building is not disrupted during work in mould contaminated areas.

3.7.1.27 Unless specified, the use of the existing power and lighting circuits shall not be allowed. Use temporary electrical panels to provide power and lighting to the decontamination facilities and the work area. One electrical panel shall be provided for every 5000 square feet of contained mould abatement work areas. Electrical panels shall be equipped and sized to handle all electrical equipment required for the completion of the project. The Contractor shall also be required to provide other additional electrical equipment such as temporary lighting, circuit breakers, panels, transformers and switch gears.

3.7.1.28 The contactor shall be responsible for establishing and maintaining fire and emergency exits from the work area that are acceptable to the Provincial Fire Marshall and other authorities having jurisdiction. The emergency exits shall be sealed in a manner that will not hinder the use of the doors during an evacuation and shall be clearly marked by using proper exit signs.

3.7.1.29 Battery powered emergency lighting shall be installed by the Contractor to provide general lighting throughout the work area in case of loss of power supply to the ground fault panel and to ensure that the emergency exits and the exit routes remain lit during the power failure.

3.7.1.30 Ensure that fire extinguishers are installed throughout the mould abatement work area at each of the emergency exits and on both sides of the decontamination facilities. All fire extinguishers installed inside the work area shall be protected by clear polyethylene sheets and shall be easily accessible in case of an emergency.

3.7.1.31 The Contractor shall place warning signs at all access points leading to the contained work area. The signs shall be posted at the curtained door ways.

3.7.1.32 Once the initial clean preparation and isolation of the work area is completed, the Contractor shall request an inspection from the Consultant before proceeding to next phase. Notify the Consultant 24 hours before the inspection is needed.

3.7.1.33 Once authorization is obtained from the Consultant, proceed to setting up the upper seal around the perimeter of the work area. The work shall be carried out as follows:

3.7.1.33.1 Ensure that all workers are using proper personal protective equipment and clothing and wetting technique during this work.

3.7.1.34 Saturate a 1 foot line of sprayed insulation applied on deck, beams, joists, etc. and remove by careful scrapping straight into a garbage bag to allow for the installation of the upper polyethylene sheeting seal.

3.7.1.35 Set up the upper seal using two layers of rip proof poly sheets. One end of the poly sheets shall be secured to the underside of the deck. The other end shall be fastened to the top of the lower work area perimeter seal. Ensure that the upper seal is airtight by sealing all opening around objects present in the ceiling space. Use smoke tubes to test the integrity of the seals.

3.7.1.36 After the complete isolation of the work area (both upper and lower seals) remove any HVAC filters that might be present within the work area and treat as mould waste.

3.7.1.37 Unless otherwise specified, all electrical systems scheduled to remain inside the work area during mould removal and clean up activities shall be sealed using duct tape and poly sheets. Examples of such systems include speakers, wiring, smoke and heat detectors, alarm equipment, communication systems, PA systems, junction boxes, etc.

3.7.1.38 Once all the preparation work is complete, the contactor shall ensure that the work area is maintained neat and organized. All the enclosures shall be inspected by the supervisor before and after the completion of each work shift to ensure that the hoarding walls, polyethylene barriers and enclosures are intact. Any damaged discovered during the inspection shall be repaired immediately. Maintain an inspection log book on site to document when (date and time) the inspection was carried out and by who (name and signature of the person). Summarize any problems encountered during the inspection.

3.7.1.39 Ensure that the negative air units and the associated ducting and exhaust openings are regularly inspected during the work shift. The pressure differential monitoring unit shall be also inspected regularly during the work shift to ensure that the specified negative pressure inside the work area is maintained.

3.7.2 Entry and Exit Procedures from Mould Abatement Work Areas: the following general procedures shall be adhered to when entering into and exiting from mould abatement work areas:

3.7.2.1 *Work Area Entry Procedures:*

3.7.2.1.1 Every worker and visitor planning to enter the work area shall remove all street clothing including undergarments and shall store them in the clean change room.

3.7.2.1.2 All uncontaminated articles such as clothing, footwear, towels, personal effects, etc. shall be store in the clean room of the decontamination facility.

3.7.2.1.3 The person shall then put on disposal coverall with head covering, respirators with clean filters and foot covering and shall proceed to the work areas through the shower and then the equipment and access room.

3.7.2.2 *Work Area Exit Procedures:*

3.7.2.2.1 Using HEPA vacuuming or wet wiping, remove all gross contamination from personal protective equipment (disposable coveralls, boots, hard hats, safety

glasses, exterior of respirator, etc.) in the work area and then proceed to the equipment and access room.

3.7.2.2.2 In the equipment and access room, remove all protective clothing except the respirator and proceed to the shower. All disposal contaminated clothing shall be placed in mould waste disposal bags. Reusable items shall be stored neatly in the equipment and access room for use during the next shift.

3.7.2.2.3 Proceed naked to the shower while still wearing the respirator. While showering, clean the outside of the respirator with soap and water. Seal the openings in the filter as per the manufacturer's instruction or using duct tape. Alternatively, the filters can be disposed of as mould contaminated waste. Continue showering by thoroughly wetting and washing the body and the head. Wet and clean the inside of the respirator. Filters shall not be allowed in the clean room if not properly sealed.

3.7.2.2.4 Upon completion of showering and drying off, proceed to the clean room and dress in street clothing.

3.7.3 Mould Removal and Clean Up Procedures

3.7.3.1 Mould removal and clean up work shall not commence until the following requirements have been met:

3.7.3.2 All work areas have been and contained as specified, decontamination enclosure systems have been set up and occupied areas of the building have been properly isolated.

3.7.3.2.1 All required notifications have been made.

3.7.3.2.2 Warnings signs have been displayed at all potential access points into the work area.

3.7.3.2.3 All arrangements have been made with the waste disposal facility.

3.7.3.2.4 All equipment, materials and tools needed inside the work area are available and in working condition.

3.7.3.2.5 Appropriate negative pressure differential have been established inside the work area with proper allowance for make up air.

3.7.3.2.6 All building security arrangements have been made.

3.7.3.2.7 Written authorization has been obtained from the Consultant to commence mould removal and clean up work.

3.7.3.3 Using an airless sprayer, mist the mould contaminated materials with water mixed with a wetting agent. Apply enough amended water to ensure that the material is wet all way through to the substrate. Avoid dripping. Etch the surface of the material being wetted in cases were the water does not penetrate the outer layer of the material.

3.7.3.4 Remove the wet mould contaminated materials in layers and/or small sections while maintaining exposed surfaces of the material in a wet condition. Spray the material regularly throughout the removal work to maintain saturation and to

minimize the generation and dispersion of dust. Ensure that the wet material does not dry out.

3.7.3.5 Ensure that the removed material and other waste generated during the removal process is collected and bagged immediately. Ensure that the waste water is also collected regularly. Avoid pooling of water. Dispose of the waste water in 6 mil polyethylene bags (or other suitable rigid containers) or pump it straight into the sanitary sewer after passing it through the specified two stage filters. Refer to Section 3.3.4 for specific procedures for handling of materials and waste.

3.7.3.6 Mist the air during the removal process using an airless sprayer capable of producing a fine mist and amended water to keep the airborne particulates levels as low as possible.

3.7.3.7 Remove deck mounted objects and other obstructions as necessary to facilitate the removal of the mould contaminated materials. Ensure that the removal work includes all mould contaminated materials specified for removal.

3.7.3.8 After completion of gross mould removal work, perform a more thorough cleaning of all surfaces that used to be covered by mould to remove all visible residue and materials. Cleaning shall be carried out using wire brushing (stiff bristle brushes such as nylon or fibre bristles), wet sponging with a detergent solution and vacuuming. Ensure that the surfaces remain wet during the performance of this work.

3.7.3.9 Notify the Consultant in cases where new areas of mould contaminated materials are discovered. The Consultant will advise the Contractor in writing regarding the next course of action.

3.7.3.10 Continue with the wet thorough cleaning activities and include other surfaces in the work area including, but not limited to, decontamination facilities, polyethylene sheeting, walls and floor surfaces, equipment, containers, piping, ducts, conduits and poly surfaces used in the equipment and access room and the equipment decontamination facilities.

3.7.3.11 Pre-filters used on the negative air units shall be removed and shall be disposed of as mould contaminated waste.

3.7.3.12 Ensure that all surfaces are left completely dry before requesting a clearance visual inspection.

3.7.3.13 Request a clearance visual inspection by the Consultant once all the cleaning activities are completed. The level of cleanliness shall be acceptable to the Consultant before clearance air samples are collected.

3.7.4 Procedures for Handling of Materials and Waste

3.7.4.1 Seal all filled mould waste containers and clean the exterior of the containers and other items by wet sponging. Move the containers from the filling area to a temporary storage area located within the enclosure and close to the equipment waste decontamination facility.

3.7.4.2 Move the item to the container cleaning room, clean by wet sponges and pass it through the curtained doorway to a second worker stationed in the holding room.

The second worker shall be fully protected (similar to the removal workers) and can only leave by going through the work area and exiting through the worker decontamination facility (after taking a shower). The second worker shall then clean, double bag and seal the item and shall pass it through the curtained doorway to a third worker stationed in the transfer room. The third worker enters the transfer room from the clean side and does not need to use personal protective equipment. The third worker is then responsible for transferring the item to the disposal bin or to the Contractor's temporary storage room or truck.

3.7.4.3 All waste generated within the mould abatement work area shall be treated as mould contaminated waste and shall be disposed of accordingly. Non-porous materials which can be properly washed and cleaned can be disposed of as normal waste after cleaning.

3.7.4.4 The contactor shall use a combination of a rigid container with 6 mil poly bag to transport and dispose of waste containing sharp materials which could rip two 6 mil poly bag.

3.7.4.5 Transportation of waste and materials through occupied areas of the building shall be limited to a time when the building is not occupied. The Contractor shall use covered carts to transport the waste inside the building. Predetermined transport routes shall be approved by the Consultant. Workers transporting the waste shall be equipped with spill kits and full personal protective equipment and shall be trained to contain and clean any spilled mould contaminated materials resulting from a failure in the waste containers.

3.7.4.6 Ensure that waste transport routes, loading areas and garbage bin storage areas are kept clean at all times. Garbage bins shall be of the fully enclosed type and shall be locked at all times when not in use. Garbage bins shall be placed only in locations specified and approved by the Owner or their representative.

3.7.4.7 Schedule garbage bin pick up and drop off times in consultation with the Consultant and ensure that the scheduled times do not interfere with the operations of the building Owner of their tenants.

3.7.4.8 Transport and dispose of mould contaminated waste as specified in Section 1.15

3.7.5 Procedures for Work Area Teardown and Dismantling

3.7.5.1 Proceed with the teardown of the work area only after obtaining written authorization from the Consultant. Ensure that Level IV procedures remain in effect during this phase of work. The worker and equipment and material decontamination units shall remain fully operational. The negative air units shall continue to operate throughout the duration of the teardown work.

3.7.5.2 Start by removing polyethylene sheeting by carefully folding it away from the walls to the centre of the work area making sure that any loose debris is trapped within the poly. Also remove all enclosures, duct tape, caulking, polyurethane foam and other materials used in setting up the enclosure. Ensure that one layer of polyethylene sheeting is kept in place in situations were re-application of new material is required. Polyethylene and other materials used in setting up enclosures shall be disposed of as mould contaminated waste.

3.7.5.3 Clean all vacuum units, fittings, hoses and other small tools used during the removal work inside the work area, seal in 6 mil poly bags and remove from the work area through the equipment and materials decontamination unit. Wash down and clean other equipment used during the work and remove from the work area.

3.7.5.4 Clean up the mould removal work area including all surfaces and all decontamination enclosures. Remove negative air units pre-filters and dispose of as mould contaminated waste. Seal the exterior of the unit on all sides with poly and remove from the work area.

3.7.5.5 Remove all waste bags containing polyethylene sheets and other materials used to set up the enclosures and dispose of as specified.

3.7.5.6 Remove all hoarding walls separating the work area from occupied areas except in locations where the walls are set up adjacent to other areas that still contain mould. Obtain approval of Consultant before dismantling hoarding walls.

3.7.5.7 Dismantle the remainder of the enclosure including scaffolding, platforms, decontamination facilities, tunnels, etc. Final clean the work area using HEPA vacuuming and wet wiping. Clean and remove all ground fault panels and temporary lighting.

3.7.6 Procedures for Re-Establishment of Objects and Systems

3.7.6.1 Re-establish mechanical and HVAC systems and install new clean air filters where previously removed. Re-establish all electrical system and return to as found condition unless otherwise specified.

3.7.6.2 Repair, replace and make good on all damages not identified during the per-removal survey.

3.7.6.3 Unless otherwise specified, all items and objects removed during the initial preparation phase of the work shall be returned to their original position and shall be properly mounted and secured.

LEAD

3.8 Type 1 Removal Operations

3.8.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.8.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.8.1.2 The Contractor is responsible for moving materials and objects which are present in the work areas.

3.8.1.3 Prevent the spread of dust from the work area using measures appropriate to the work to be done.

3.8.1.3.1 Shut off, lock out and seal all ventilation duct vents with the application of one layer of 6 mil (0.15mm) thick clear polyethylene sheet sealed with tape.

3.8.1.3.2 Use FR polyethylene drop sheets over all flooring in work areas where dust, chips, or debris may be produced and where contamination cannot otherwise be thoroughly cleaned.

3.8.1.3.3 Separate parts of the building required to remain in use from the work area by polyethylene drop sheets at the perimeter of the work area.

3.8.1.3.4 Separate the work area with clearly visible warning signs advising of the hazards of lead dust and that entry is restricted to authorized trained personnel wearing personal protective equipment.

3.8.1.3.5 Erect scaffolding or platforms where necessary to perform the removal work. All platforms that exceed 25 feet in height will require the submission of a shop drawing stamped by a professional engineer for approval by the inspector within a minimum of 5 days prior to commencing the work. Guard rails shall be provided around all platforms or scaffolding where practicable. Cover the floor area of the scaffold or platform with one layer of FR polyethylene. Extend the floor of scaffolding or platform under an item being removed to act as a receptacle. Polyethylene sheeting shall be suitably braced and/or restrained so that billowing or failure of the polyethylene sheeting or taped joints does not occur.

3.8.2 Entry and Exit Procedures from Lead Removal Work Areas: the following general procedures shall be adhered to when entering into and exiting from lead abatement work areas:

3.8.2.1 Work Area Entry Procedures:

3.8.2.1.1 Every worker and visitor planning to enter the work area should remove all street clothing and should store them in a designated clean change room.

3.8.2.1.2 The person shall then put on disposal coverall with head covering, respirators with clean filters and foot covering and shall proceed to the work area.

3.8.2.2 Work Area Exit Procedures:

3.8.2.2.1 Each worker shall decontaminate their protective clothing, boots and respirator by first HEPA vacuuming and then by damp wiping using soap and water.

3.8.2.2.2 The removed disposable coveralls shall be disposed of as lead waste in a 0.15 mm (6 mil) labelled waste bag. Respirator filter inlets shall be sealed in tape or disposed of as lead waste.

3.8.3 Lead Removal Procedures

3.8.3.1 Lead removal shall not commence until:

3.8.3.1.1 The work area is effectively separated from clean areas of the building.

3.8.3.1.2 Warning signs are posted outside the removal work areas.

3.8.3.1.3 All surfaces which are not possible to clean are sealed with polyethylene sheeting and tape.

3.8.3.1.4 Arrangements have been made for waste disposal, landfill site operator has been contacted and storage bin is on site.

3.8.3.1.5 Tools equipment and materials are on hand and in the work area.

3.8.3.1.6 Facilities for the washing of hands and face are available for workers leaving the work area.

3.8.3.2 Before beginning work remove visible dust from surfaces in the work area where dust is likely to be disturbed during the course of the work. Use HEPA vacuums, or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate. Do not use compressed air or dry sweeping to clean up or remove dust from any surface.

3.8.3.3 Wet materials containing lead to be cut, ground, abraded, drilled, or otherwise disturbed with amended water. Use garden type low velocity fine mist sprayer. Perform work in a manner to reduce dust creation to lowest levels practicable. Spray lead material repeatedly during the work process to minimize airborne lead dust.

3.8.4 Final Clean

3.8.4.1 When removal is complete, clean the entire work area by HEPA vacuuming and wet wiping.

3.8.4.2 The work area shall be deemed clean by the Inspector when there is no visible residue, dust, dirt, film, stain, or discolouration resulting from either lead removal or cleaning activities.

3.8.4.3 After completion of the initial cleaning and after the Inspector has passed the visual inspection, spray sealant on all surfaces in the work area, including, but not limited to:

3.8.4.3.1 where lead material has been removed.

3.8.4.3.2 polyethylene sheeting used on walls, floors and ceilings.

3.8.4.4 Sealant should be sprayed using a garden reservoir type low velocity fine mist sprayer. The sprayer cannot be used if the nozzle is partially obstructed, or if a uniform fine mist spray cannot be obtained.

3.8.4.5 After the area is declared clean and written approval to proceed has been received from the Inspector:

3.8.4.5.1 Dismantle boundaries and isolating barriers as lead waste. Drop sheets shall be wetted and folded to contain dust and then placed in waste bags.

3.8.4.5.2 Immediately before their removal from the work area, and disposal, clean each filled labelled waste bag using damp cloths or HEPA vacuum and place in second clean clear polyethylene waste bag.

3.8.4.5.3 Dispose of waste as per procedures specified in subsection 1.16 Waste Transport and Disposal.

3.8.4.6 Repair or replace objects damaged in the course of the work. Re-establish objects moved to temporary locations in the course of the work, in their proper positions. Re-secure mounted objects removed in the course of the work in their former positions.

3.9 Type 2a and 2b Removal Operations

3.9.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.9.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.9.1.2 The Contractor is responsible for moving materials which are present in the work area.

3.9.1.3 Prevent the spread of dust from the work area using measures appropriate to the work to be done.

3.9.1.3.1 Shut off, lock out and seal all ventilation duct vents with the application of one layer of 6 mil (0.15 mm) thick clear polyethylene sheet sealed with tape.

3.9.1.3.2 Clean all moveable objects within proposed work area using a HEPA vacuum.

3.9.1.3.3 Clean fixed casework and equipment within proposed work area, using a HEPA vacuum and cover with polyethylene sheeting sealed with tape.

3.9.1.3.4 Clean proposed work areas using, where practicable, HEPA vacuum cleaning equipment. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA filter-equipped vacuums.

3.9.1.3.5 Cover and seal airtight light fixtures, duct openings and other suspended ceiling objects using clear 6 mil polyethylene sheeting and tape.

3.9.1.3.6 Erect scaffolding or platforms necessary to perform the removal work. All platforms that exceed 25 feet in height will require the submission of a shop drawing stamped by a professional engineer for approval by the inspector within a minimum of 5 days prior to commencing the work. Guard rails shall be provided around all platforms or scaffolding where practicable.

3.9.1.3.6.1 Cover floor area of scaffold or platform with one layer of FR polyethylene.

3.9.1.3.6.2 Extend scaffolding or platform under the item being removed to prevent material from falling.

3.9.1.3.7 Separate parts of the building required to remain in use from the work area by polyethylene drop sheets at the perimeter of the work area.

3.9.1.3.8 Set up an airtight enclosure around the work area where the work on lead-containing material is to be carried out. Enclosure should be set up using 1 layer of FR polyethylene sheeting to cover the floors, and 1 layer of 6 mil (0.15 mm) thick clear polyethylene sheeting to cover the walls. Two layers of FR polyethylene sheeting should be used to cover carpeted floors. Polyethylene on the walls should be made to overlap with the polyethylene on the floor a minimum of 300 mm.

3.9.1.3.9 Polyethylene sheeting shall be suitably braced and/or restrained so that excessive billowing or failure of the polyethylene sheeting or taped joints does not occur as a result of the negative pressure differential created by the vacuums.

3.9.1.3.10 Erect a temporary structure made of wooden studs to support polyethylene sheeting where necessary.

3.9.1.3.11 Insert a hose of a HEPA filter equipped vacuum into the enclosure to provide negative air pressure inside the enclosure.

3.9.1.3.12 Entrance to the enclosure should be covered with two pieces of overlapping polyethylene sheeting.

3.9.1.3.13 The Contractor shall separate the work area and place warning signs at all access points leading to the contained work area. The signs shall be posted at the curtained door ways and shall read:

CAUTION
LEAD DUST, FUME, or MIST HAZARD AREA
NO UNAUTHORIZED ENTRY
WEAR ASSIGNED PROTECTIVE EQUIPMENT
BREATHING LEAD DUST MAY CAUSE SERIOUS BODILY HARM

3.9.2 Entry and Exit Procedures from Lead Removal Work Areas: the following general procedures shall be adhered to when entering into and exiting from lead abatement work areas:

3.9.2.1 Work Area Entry Procedures:

3.9.2.1.1 Every worker and visitor planning to enter the work area should remove all street clothing and should store them in a designated clean change room.

3.9.2.1.2 The person shall then put on disposable coveralls with head covering, respirators with clean filters and foot covering and shall proceed to the work area through the flaps covering the entrance to the enclosure.

3.9.2.2 Work Area Exit Procedures:

3.9.2.2.1 Each worker shall decontaminate their protective clothing, boots and respirator by first HEPA vacuuming and then by damp wiping using soap and water.

3.9.2.2.2 The removed disposable coveralls shall be disposed of as lead waste in a 0.15 mm (6 mil) labelled waste bag. Respirator filter inlets shall be sealed in tape or disposed of as lead waste.

3.9.3 Lead Removal Procedures

3.9.3.1 Lead removal shall not commence until:

3.9.3.1.1 The work area is effectively separated from clean areas of the building.

3.9.3.1.2 Warning signs are posted outside the removal work areas.

3.9.3.1.3 All surfaces which are not possible to clean are sealed with polyethylene sheeting and tape.

3.9.3.1.4 Arrangements have been made for waste disposal, landfill site operator has been contacted and storage bin is on site.

3.9.3.1.5 Tools, equipment and materials are on hand and in the work area.

3.9.3.1.6 Facilities for the washing of hands and face are available for workers leaving the work area.

3.9.3.2 Before beginning the work, remove visible dust from the surfaces in the work area. Use HEPA vacuums, or damp cloths where damp cleaning is considered more appropriate. Do not use compressed air or dry sweeping to clean up or remove dust from any surface.

3.9.3.3 Wet materials containing lead to be removed, disturbed, or sealed with amended water. Garden reservoir type low velocity fine mist sprayer may be used. Perform work in a manner to reduce dust creation to lowest levels practicable. Spray lead material repeatedly during the work process to minimize airborne lead dust.

3.9.3.4 Removed material has to be placed directly in waste bags. Wherever possible, lead-containing material should be removed in sections as intact as possible.

3.9.3.5 Areas that used to be covered with the lead-containing material should be cleaned after the material is removed, using brushes, steel wool, or any other tools suitable.

3.9.3.6 Frequently during the work and immediately after completion of the work, clean up dust and waste containing lead using a HEPA vacuum or by damp wiping.

3.9.3.7 All labelled waste bags should be placed in clean clear 6 mil poly bags before they are taken out of the enclosure.

3.9.4 Final Clean

3.9.4.1 When removal is complete, clean the entire work area by HEPA vacuuming and wet wiping.

3.9.4.2 All tools and equipment used in the removal process such as knives, extension cords, scrapers, wire brushes, garden sprayers etc., should be washed and cleaned and placed in 6 mil polyethylene bags.

3.9.4.3 The work area shall be deemed clean by the Inspector when there is no visible residue, dust, dirt, film, stain, or discolouration resulting from either lead removal or cleaning activities.

3.9.4.4 The enclosure should be left standing until wipe sample(s) are taken inside the enclosure, and the lead concentration level is below 40 µg/ft^2 for floors and/or 250 µg/ft^2 for window sills, and/or 400 µg/ft^2 for window sills.

3.9.4.5 After the area is declared clean and written approval to proceed has been received from the Inspector:

3.9.4.5.1 Dismantle boundaries and isolating barriers and treat as lead waste. Drop sheets shall be wetted and folded to contain dust and then placed in waste bags.

3.9.4.5.2 Immediately before their removal from the work area, and disposal, clean each filled labelled waste bag using damp cloths or HEPA vacuum and place in second clean clear polyethylene waste bag.

3.9.4.5.3 Dispose of waste as per procedures specified in subsection 1.16 Waste Transport and Disposal.

3.9.4.6 Repair or replace objects damaged in the course of the work. Re-establish objects moved to temporary locations in the course of the work, in their proper positions. Re-secure mounted objects removed in the course of the work in their former positions.

3.10 Type 3a and 3b Removal Operations

3.10.1 Initial Preparation and Isolation of Work Areas: Unless otherwise specified, work carried out as part of this phase shall proceed as follows:

3.10.1.1 Carry out a survey of the work areas to compile an inventory of existing damages and provide a copy to the Consultant.

3.10.1.2 The Contractor is responsible for moving materials and objects which are present in the work areas.

3.10.1.3 Separate the lead removal work areas from other areas in the building required to remain in use by erecting floor to ceiling rip-proof polyethylene sheeting supported on wood framing.

3.10.1.4 All surfaces, equipment and objects located in the work areas and not scheduled for removal shall be pre-cleaned by HEPA vacuuming or wet wiping and shall be protected by one layer of rip proof poly sheeting unless otherwise specified. Dry sweeping or vacuuming with units not equipped with HEPA filters shall not be allowed.

3.10.1.5 All equipment, objects and articles scheduled for removal shall be taken out of the work area only if its removal will not disturb any lead-containing materials.

3.10.1.6 Ensure that smoke detectors, fire alarms, heat detectors and other life safety equipment remain active and operating as installed.

3.10.1.7 All specified clean demolition work can be carried out before the Type 3 enclosure is set up on condition that the demolition work does not disturb any lead-containing materials.

3.10.1.8 Construct the decontamination enclosure systems for workers and for equipment and materials as specified.

3.10.1.9 Independently seal off all openings leading to the work area using polyethylene sheeting and duct tape. Such openings include, but are not limited to, windows, doorways, corridors, skylights, diffusers, grills and air ducts. Also seal all floor openings independently before covering the entire floor with polyethylene sheeting. Ensure that the individual seals are air tight and water tight.

3.10.1.10 Cover floors with two independently sealed layers of polyethylene sheeting and seal with duct tape. The first layer immediately above the floor shall be 6 mil poly. The other layer shall be rip proof poly. Poly on the floor shall extend a minimum of 30 cm up all vertical surfaces located in the work area.

3.10.1.11 Cover walls with two independently sealed layers of 6 mil clear polyethylene sheeting. Overlap floor poly with wall poly by a minimum of 30 cm at each layer. The layers of wall poly shall always overlap the layers of the floor poly.

3.10.1.12 Ensure that adjoining sheets of poly used on walls and floors overlap by at least 30 cm.

3.10.1.13 Ensure that poly sheets are properly supported to avoid excessive billowing and failure of the enclosure as a result of applying negative pressure differential. Brace the poly in case of excessive billowing using 1”x2” straps or any other measures and means as required.

3.10.1.14 Use flame resistant polyethylene sheeting near heat sources.

3.10.1.15 Create negative pressure in the work area using HEPA-filtered negative air unit distributed evenly (horizontally and vertically) within the work area. Supply any necessary platforms as required to elevate the negative air unit.

3.10.1.16 Provide enough negative air units to be able to exchange the air volume of the work area at least once every 20 minutes (three air changes per hour) and to maintain a minimum of 0.02” water gauge differential.

3.10.1.17 The pressure differential shall be continuously monitored using an automatic recorder as specified. Place the monitor outside the contaminated work area. A backup negative air unit shall be set up and ready for operation in case one of the original units fail.

3.10.1.18 Operate the negative air units from the start of the preparation and isolation phase until completion of the final clean up work and air testing.

3.10.1.19 Ensure that the necessary make up air is supplied to the work area through flaps installed in the perimeter seal.

3.10.1.20 Replace pre-filters and HEPA filters as necessary to maintain the proper flow rate and to ensure that the unit continues to function properly.

3.10.1.21 Contaminated air from the work area shall be exhausted directly to the outside through sealed ducts. Where necessary, remove existing windows and replace with a plywood panel. Secure the panel in place and make weather tight using caulking. Install appropriately sized openings for exhaust (typically 12”). Replace windows upon completion of work.

3.10.1.22 All negative air units which are set up to discharge inside the building shall be leak tested in place using the DOP method.

3.10.1.23 The Contractor is allowed to connect to the owner’s existing water supply for use in the lead work areas and in the temporary shower and decontamination facilities. The Contractor shall be responsible for making all the connections using vacuum breakers and other backflow preventers.

3.10.1.24 The Contractor shall use copper pipes and fittings and high pressure hoses when making connections to the main water supply. The Contractor shall also install a main shut-off valve on the clean side of the decontamination enclosure. All connections shall be made down stream form the main shut-off valve. Ensure that the pressure in the temporary water distribution system is relieved if the system is to be left unattended. Ensure that no leaks are present around hose pipe connections. Minimize the possibility of water damage through spills or leaks by providing drip pans of suitable size and by ensuring that the drip pans are drained regularly.

3.10.1.25 Ensure that all water from the drainage facilities installed on the shower and other decontamination enclosures is passed through filtration systems as specified.

3.10.1.26 Test all temporary piping installed during this project and ensure that they are watertight. All temporary pipe installation shall remain water tight for the duration of the project. Pipes shall be installed parallel to walls and shall be temporarily secured

to existing structures. Ensure that all piping is removed upon completion of work. Avoid damaging or altering the owner's existing water equipment and piping.

3.10.1.27 All electrical work shall be performed by a licensed electrician in compliance with all applicable regulations. Isolate, disconnect and lockout all power supplying or passing through the work area. Ensure that power supply to the remaining areas of the building is not disrupted during work in lead contaminated areas.

3.10.1.28 Unless specified, the use of the existing power and lighting circuits shall not be allowed. Use temporary electrical panels to provide power and lighting to the decontamination facilities and the work area. One electrical panel shall be provided for every 5000 square feet of contained lead work areas. Electrical panels shall be equipped and sized to handle all electrical equipment required for the completion of the project. The Contractor shall also be required to provide other additional electrical equipment such as temporary lighting, circuit breakers, panels, transformers and switch gears.

3.10.1.29 The contactor shall be responsible for establishing and maintaining fire and emergency exits from the work area that are acceptable to the Provincial Fire Marshall and other authorities having jurisdiction. The emergency exits shall be sealed in a manner that will not hinder the use of the doors during an evacuation and shall be clearly marked by using proper exit signs.

3.10.1.30 Battery powered emergency lighting shall be installed by the Contractor to provide general lighting throughout the work area in case of loss of power supply to the ground fault panel and to ensure that the emergency exits and the exit routes remain lit during the power failure.

3.10.1.31 Ensure that fire extinguishers are installed throughout the lead work area at each of the emergency exits and on both sides of the decontamination facilities. All fire extinguishers installed inside the work area shall be protected by clear polyethylene sheets and shall be easily accessible in case of an emergency.

3.10.1.32 The Contractor shall place warning signs at all access points leading to the contained work area. The signs shall be posted at the curtained door ways and shall read:

CAUTION
LEAD DUST, FUME, or MIST HAZARD AREA
NO UNAUTHORIZED ENTRY
WEAR ASSIGNED PROTECTIVE EQUIPMENT
BREATHING LEAD DUST MAY CAUSE SERIOUS BODILY HARM

3.10.1.33 Once the initial clean preparation and isolation of the work area is completed, the Contractor shall request an inspection from the Consultant before proceeding to next phase. Notify the Consultant 24 hours before the inspection is needed.

3.10.1.34 Once authorization is obtained from the Consultant, proceed to setting up critical seals that become accessible once removal operations commence.

3.10.1.35 Shut off and lock out the HVAC system serving the subject work area. Ensure that all work requiring the complete shutdown of the HVAC system is carried out during the time when the building is not occupied.

3.10.1.36 Unless otherwise specified, all electrical systems scheduled to remain inside the work area during lead removal activities shall be sealed using duct tape and poly sheets. Examples of such systems include speakers, wiring, smoke and heat detectors, alarm equipment, communication systems, PA systems, junction boxes, etc.

3.10.1.37 Once all the preparation work is complete, the contactor shall ensure that the work area is maintained neat and organized. All the enclosures shall be inspected by the supervisor before and after the completion of each work shift to ensure that the hoarding walls, polyethylene barriers and enclosures are intact. Any damaged discovered during the inspection shall be repaired immediately. Maintain an inspection log book on site to document when (date and time) the inspection was carried out and by who (name and signature of the person). Summarize any problems encountered during the inspection.

3.10.1.38 Ensure that the negative air units and the associated ducting and exhaust openings are regularly inspected during the work shift. The pressure differential monitoring unit shall be also inspected regularly during the work shift to ensure that the specified negative pressure inside the work area is maintained.

3.10.2 Entry and Exit Procedures from Lead Removal Work Areas: the following general procedures shall be adhered to when entering into and exiting from lead abatement work areas:

3.10.2.1 *Work Area Entry Procedures:*

3.10.2.1.1 Every worker and visitor planning to enter the work area shall remove all street clothing including undergarments and shall store them in the clean change room.

3.10.2.1.2 All uncontaminated articles such as clothing, footwear, towels, personal effects, etc. shall be store in the clean room of the decontamination facility.

3.10.2.1.3 The person shall then put on disposal coverall with head covering, respirators with clean filters and foot covering and shall proceed to the work areas through the shower and then the equipment and access room.

3.10.2.2 Work Area Exit Procedures:

3.10.2.2.1 Using HEPA vacuuming or wet wiping, remove all gross contamination from personal protective equipment (disposable coveralls, boots, hard hats, safety glasses, exterior of respirator, etc.) in the work area and then proceed to the equipment and access room.

3.10.2.2.2 In the equipment and access room, remove all protective clothing except the respirator and proceed to the shower. All disposal contaminated clothing shall be placed in lead disposal bags. Reusable items shall be stored neatly in the equipment and access room for use during the next shift.

3.10.2.2.3 Proceed naked to the shower while still wearing the respirator. While showering, clean the outside of the respirator with soap and water. Seal the openings in the filter as per the manufacturer's instruction or using duct tape. Alternatively, the filters can be disposed of as lead waste. Continue showering by thoroughly wetting and washing the body and the head. Wet and clean the inside of the respirator. Filters shall not be allowed in the clean room if not properly sealed.

3.10.2.2.4 Upon completion of showering and drying off, proceed to the clean room and dress in street clothing.

3.10.3 Lead Removal Procedures

3.10.3.1 Lead removal work shall not commence until the following requirements have been met:

3.10.3.2 All work areas have been and contained as specified, decontamination enclosure systems have been set up and occupied areas of the building have been properly isolated.

3.10.3.2.1 All required notifications have been made.

3.10.3.2.2 Warnings signs have been displayed at all potential access points into the work area.

3.10.3.2.3 All arrangements have been made with the waste disposal facility.

3.10.3.2.4 All equipment, materials and tools needed inside the work area are available and in working condition.

3.10.3.2.5 Appropriate negative pressure differential have been established inside the work area with proper allowance for make up air.

3.10.3.2.6 All building security arrangements have been made.

3.10.3.2.7 Written authorization has been obtained from the Consultant to commence lead removal work.

3.10.3.3 Using an airless sprayer, spray the lead-containing material with water mixed with a wetting agent. Apply enough amended water to ensure that the material is wet.

3.10.3.4 Remove the wet lead-containing materials in layers and/or small sections. Spray the material regularly throughout the removal work to maintain saturation and to minimize the generation and dispersion of dust. Ensure that the wet material does not dry out.

3.10.3.5 Ensure that the removed material and other waste generated during the removal process is collected and bagged immediately. Place the material in 6 mil bags. Ensure that the waste water is also collected regularly. Avoid pooling of water. Dispose of the waste water in labelled 6 mil polyethylene bags (or other suitable rigid containers) or pump it straight into the sanitary sewer after passing it through proper filters. Refer to Section 3.3.4 for specific procedures for handling of materials and waste.

3.10.3.6 Mist the air during the removal process using an airless sprayer capable of producing a fine mist and amended water to keep the airborne dust levels as low as possible. Monitor the air inside and outside of the work area during removal.

3.10.3.7 Remove deck mounted objects and other obstructions as necessary to facilitate the removal of the lead-containing materials. Ensure that the removal work includes all lead-contaminated materials specified for removal.

3.10.4 Final Clean

3.10.4.1 After completion of gross lead removal work, perform a more thorough cleaning of all surfaces that used to be covered by lead to remove all visible residue and dust-containing materials. Cleaning shall be carried out using wire brushing, wet sponging, wet sweeping and/or wet shovelling and HEPA vacuuming. Ensure that the surfaces remain wet during the performance of this work.

3.10.4.2 All tools and equipment used in the removal process such as hook knives, extension cords, scrapers, wire brushes, garden sprayers etc, should be washed and cleaned and placed in 6 mil polyethylene bags.

3.10.4.3 Notify the Consultant in cases where leads-containing materials is encountered which cannot be properly removed without demolishing building structural members or removing major service elements. The Consultant will advise the Contractor in writing regarding the next course of action.

3.10.4.4 Continue with the wet thorough cleaning activities and include other surfaces in the work area including, but not limited to, decontamination facilities, polyethylene sheeting, walls and floor surfaces, equipment, containers, piping, ducts, conduits and poly surfaces used in the equipment and access room and the equipment decontamination facilities. Pre-filters used on the negative air units shall be removed and shall be disposed of as lead waste.

3.10.4.5 The work area shall be deemed clean by the Consultant when there is no visible residue, dust, dirt, film, stain, or discolouration resulting from either lead removal or cleaning activities.

3.10.4.6 The work area shall be considered acceptable for public occupancy only if the lead concentrations inside the work area are below 40 µg/ft^2 for floors and/or 250 µg/ft^2 for window sills, and/or 400 µg/ft^2 for window sills. Levels above the clearance standards requires that the entire area be re-cleaned and another coat of lock-down agent be applied by the Contractor on all surfaces in the work area. Re-sampling will be carried out and the entire process shall be repeated until the fibres levels are below the clearance standards.

3.10.4.7 The Contractor shall be responsible for all charges associated with re-cleaning work and other associated requirements as specified.

3.10.5 Procedures for Work Area Teardown and Dismantling

3.10.5.1 Proceed with the teardown of the work area only after obtaining written authorization from the Consultant. Ensure that Type 3 procedures remain in effect during this phase of work. The worker and equipment and material decontamination units shall remain fully operational. The negative air units shall continue to operate throughout the duration of the teardown work.

3.10.5.2 Start by removing polyethylene sheeting by carefully folding it away from the walls to the centre of the work area making sure that any loose debris is trapped within the poly. Also remove all enclosures, duct tape, caulking, polyurethane foam and other materials used in setting up the enclosure. Polyethylene and other materials used in setting up enclosures shall be disposed of as lead-contaminated waste.

3.10.5.3 Clean all vacuum units, fittings, hoses and other small tools used during the removal work inside the work area, seal in 6 mil poly bags and remove from the work area

through the equipment and materials decontamination unit. Wash down and clean other equipment used during the work and remove from the work area.

3.10.5.4 Clean up the lead work area including all surfaces and all decontamination enclosures. Remove negative air units pre-filters and dispose of as lead waste. Seal the exterior of the unit on all sides with poly and remove from the work area.

3.10.5.5 Remove all waste bags containing polyethylene sheets and other materials used to set up the enclosures and dispose of as specified.

3.10.5.6 Remove all hoarding walls separating the work area from occupied areas except in locations where the walls are set up adjacent to other areas that still contain lead. Obtain approval of Consultant before dismantling hoarding walls.

3.10.5.7 Dismantle the remainder of the enclosure including scaffolding, platforms, decontamination facilities, tunnels, etc. Final clean the work area using HEPA vacuuming and wet wiping. Clean and remove all ground fault panels and temporary lighting.

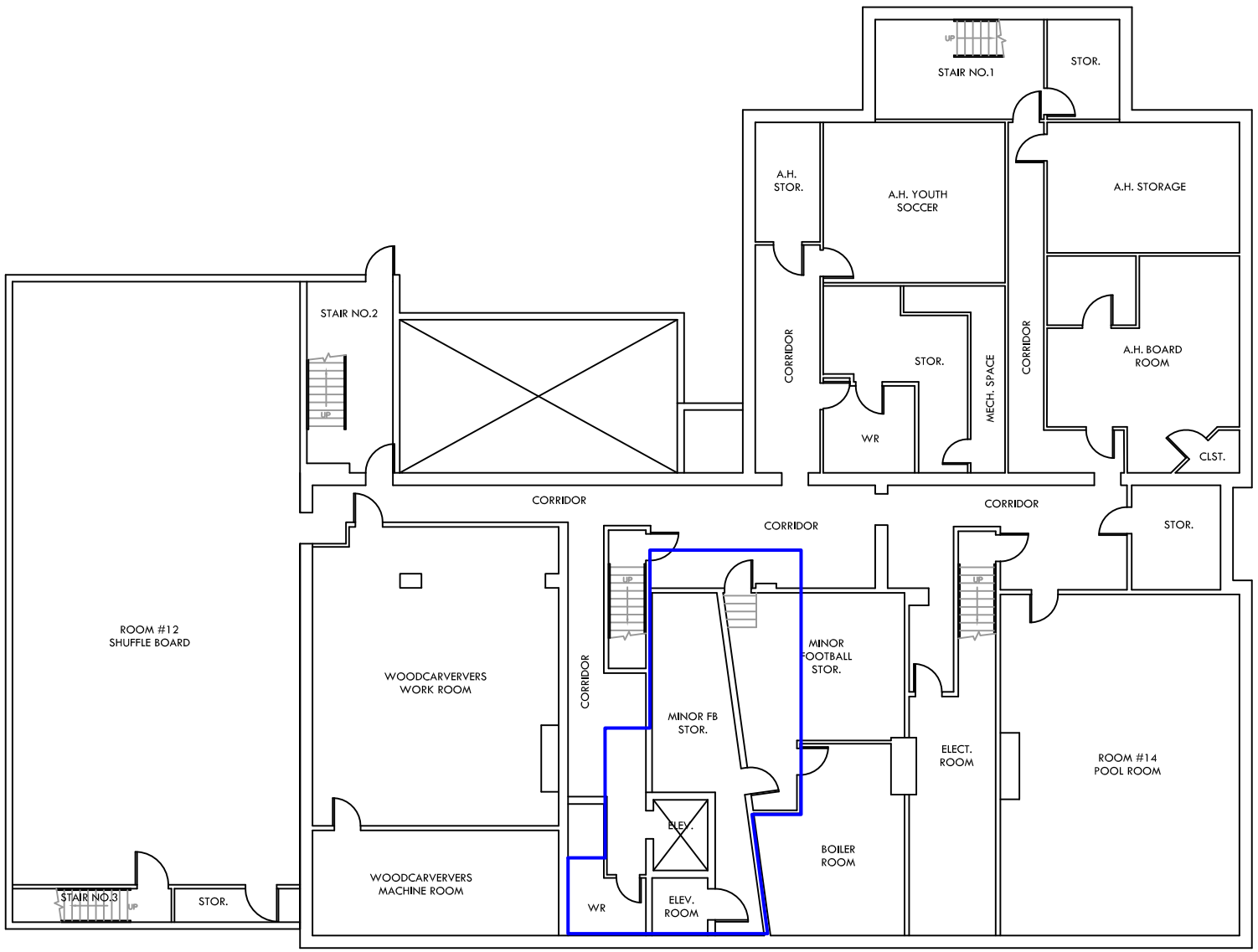
3.10.6 Procedures for Re-Establishment of Objects and Systems

3.10.6.1 Re-establish mechanical and HVAC systems and install new clean air filters where previously removed. Re-establish all electrical system and return to as found condition unless otherwise specified.

3.10.6.2 Repair, replace and make good on all damages not identified during the per-removal survey.

3.10.6.3 Unless otherwise specified, all items and objects removed during the initial preparation phase of the work shall be returned to their original position and shall be properly mounted and secured.

END OF SECTION



Legend:

WORK AREA 1

Notes:
Locations of site features are approximate and may vary from that shown

Drawing Title:

WORK AREA 1

Client Address:

City of Peterborough
500 George St. N.
Peterborough, ON

Project Location:

Queen Alexandra Community Centre
Basement
180 Barnardo Ave.
Peterborough, ON

Project No: 31856

N

Date: Jan 2025

Drawing No: 1

Scale: NTS

Drawn By: SY

Approved By: MZ

CONSULTANTS
Occupational Hygiene & Engineering