



Asbestos Abatement Specification

Public Works Building
1539 Waverley St

Prepared for:
City of Winnipeg
4th Floor, 185 King Street
Winnipeg, MB



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ABATEMENT SCOPE OF WORK

LOCATION: Public Works Building
1539 Waverley St
Winnipeg, Manitoba

DATE PREPARED: October 9, 2018

1.0 PURPOSE AND SUMMARY

This abatement specification has been prepared to provide specific requirements for abatement contractors when completing asbestos abatements and removals of asbestos-containing materials as part of projects for the City of Winnipeg Public Works building located at 1539 Waverley St.

Renovations are being planned which include removing a portion of a cinder block (concrete masonry units) wall in the work shop area in the south-east portion of the building which has been confirmed to be filled with loose fill vermiculite insulation, and which is presumed to contain small amounts of amphibole asbestos. The removal of the concrete block wall will be completed based on High Risk (Type 3) abatement procedures, or as modified by this specification.

As part of the planned abatement work, holes will be made through existing cinder block walls to accommodate new ventilation ductwork. The work to make these holes will be completed based on Moderate Risk (Type 2) procedures.

Air monitoring will be completed in adjacent occupied areas throughout the abatement process.

Inspections of Type 3 containments before, during and after removals will be completed and final clearance inspections will include air clearance testing.

2.0 DEFINITIONS

Asbestos: Asbestos is a naturally occurring silicate mineral with long, thin fibrous crystals. The mineral was widely used in a large number of applications, particularly as a flame retardant or insulating material.

Asbestos is considered a designated material under the Controlled Products Regulations and is a known carcinogen. Chronic exposure to asbestos can lead to asbestosis and mesothelioma (a type of lung cancer), amongst others.

Asbestos has also been found in many products around the home or office, including clapboard, roofing shingles, attic insulation (vermiculite), exterior siding, pipe and boiler covering, cement, caulking, roof patching material, furnace cement, driveway coatings, wallboard, textured and latex paints, acoustical ceiling tiles, wall plaster, vinyl floor tiles, appliance wiring, hair dryers, irons and ironing board pads.

Although asbestos has caused serious health problems for workers and continues to be a risk within building maintenance, renovation, construction and demolition trades, it does not pose a significant risk for the general occupants of a building. Airborne asbestos fibers are a significant health risk.

In general, the use of asbestos has been discontinued due to the adverse health effects from inhalation of asbestos fibers.

Asbestos-Containing Material: Commonly abbreviated as ACM.

In the Province of Manitoba, a material must be considered as an ACM as follows:

A friable material with 0.1% asbestos or greater.

A non-friable material with 1.0% asbestos or greater.

Vermiculite insulation that contains asbestos

Once presence of asbestos is confirmed using polarized light microscopy, standard methodologies rely on a visual estimation method that cannot reliably estimate content below 1% and so any positive result will be interpreted as meeting the definition of an asbestos-containing materials unless more rigorous testing and extensive sampling is completed.

Asbestos Dust: Particles of asbestos or settled particles of asbestos which may become airborne in the workplace.

Friable Material: A material that when dry can be crumbled, crushed or powdered by hand pressure. Examples would include pipe wrap insulation, sprayed-on fireproofing, plaster, ceiling tiles and vermiculite.

Non-Friable Material: A material that when dry will not easily be crumbled by hand pressure. Examples of non-friable materials include vinyl asbestos floor tiles or sheets, drywall joint compound and gaskets. Non-friable materials may still generate airborne fibers if mishandled.

Designated Substance: A chemical substance that meets the criteria as a carcinogen, mutagen, respiratory sensitizer, reproductive toxin, fetotoxin or teratogen under the Controlled Products Regulations. Examples of some commonly encountered designated substances include asbestos, lead, mercury, silica, arsenic, benzene and isocyanates.

Occupational Exposure Limit (OEL): According to Part 36, section 36.5(1) (b) of the Manitoba Workplace Safety and Health Regulation 217/2006, the occupational exposure limit of a designated material must be as close to zero as is reasonably practicable, but shall not exceed the Threshold Limit Value (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH).

In Manitoba, the Workplace Safety and Health Regulation adopts the current ACGIH TLVs as the allowable OEL for those chemical and biological substances where a TLV exists.

The Manitoba Workplace Safety and Health Division recognizes the level as close to zero as is reasonably practicable for all forms of asbestos as 0.1 fibers per cubic centimeter of air (f/cc or f/cm³), which matches the TLV established by ACGIH.

Following asbestos abatement activities, airborne asbestos fiber concentrations must be reduced to a maximum concentration of 0.01 f/cc of air for all forms of asbestos before the negative pressure enclosure is removed and workers and others are allowed to reoccupy an area where asbestos has been removed.

Threshold Limit Value-Time-Weighted Average (TLV-TWA): The TWA concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, for a working lifetime without adverse effect. The TLVs established by ACGIH do not take into account individual sensitivities, pre-existing conditions or other health factors, such as cigarette smoking.

3.0 ASBESTOS-CONTAINING MATERIALS (ACMs)

The suspect, presumed or confirmed asbestos-containing materials present within the work areas are:

Vermiculite Insulation: Loose-fill vermiculite insulation is present within the void space of cinder block walls within the work area, and partial removal of a cinder block wall will be required.

The asbestos content of vermiculite is not intentional. The asbestos that may be present in vermiculite products is an unwanted natural contaminant carried along from the rocks in the vermiculite mine to the final product. Vermiculite attic insulation will contain small amounts amphibole asbestos (generally <1% actinolite/tremolite), which is loose within the material and is not bound within the material itself, as it would be in manufactured products like floor tiles or even asbestos insulation products. Since the asbestos will

readily become airborne with minimal disturbance, the material is considered very friable.

Pipe Elbow Insulation: The insulation at pipe elbows on heating lines throughout the building have been identified as ACM, by the City of Winnipeg.

The material is high-content, friable ACM, and is generally considered moderate to high risk material. Inspections are required to ensure that

Joint Compound: Drywall joint compound in the building has been identified as ACM by the City of Winnipeg.

Mastics: There are some ACM mastics identified by City of Winnipeg in the building. These materials may be outside scope of work, but any suspect ACM mastics should be handled as ACM. If present, this material is non-friable and low risk.

Floor Tiles: There are some ACM floor tiles identified by City of Winnipeg in the building. These materials may be outside scope of work, but any suspect ACM floor tiles should be handled as ACM. If present, this material is non-friable and low risk.

There may be additional ACM in other parts of the building, and the above listing is limited to the work area related to this abatement specification. If additional suspect ACM are present within the work area, stop work and notify the Asbestos Abatement Consultant.

4.0 SITE CONDITIONS

- 4.1. The building is a Public Works Building located at 1539 Waverley St. The building will be occupied and in use during the work planned.
- 4.2. Other workers will be present within this space outside enclosures, while abatement work is occurring.
- 4.3. The main work area for the Type 3 abatement is the work shop with overhead doors at the south side of the building, and the adjacent garage area to the west. The cinder block wall separating these two areas will be partially removed to accommodate renovation plans.

5.0 ABATEMENT PLAN

5.1. Overview and Scope - Workshop Area Type 3 Work

The cinder block wall separating the main workshop area and the adjacent garage area will be partially removed to accommodate renovation plans. The void spaces for this block wall contains vermiculite insulation, and the demolition of the wall will be completed under Type 3 procedures.

These removals will be completed using Type 3 (High Risk) abatement procedures generally, or as modified by this specification.

A Type 3 enclosure shall be built to encompass the entire workshop area and a portion of the garage which will be included within the work area. For the workshop area, the walls already enclose the work area and the walls will be used to defined the work area. A stand-alone wall will need to be built in the adjacent garage area, approximately 5 - 10 feet from the cinder block wall to be removed, to include this space within the work area enclosed. The amount of work space should be adequate given the type of work planned, including construction of scaffolding or the use of elevated work platforms as may be needed.

Access to the Type 3 enclosure will be from the outside door located within the workshop area. Gowning chambers shall be built immediately inside the workshop area.

Three (3) separate chambers shall be constructed for waste decontamination and removal, generally in the same area of the personnel chambers at the south end of the workshop near overhead door and man door. A significant amount of waste needs to be removed, and removal should not be through shower. Air shall be exhausted out of the building for the duration of the work, and air should be drawn from within the enclosed space as far from the chamber entrance as possible.

Differential pressure monitoring equipment capable of data logging pressures or alarm conditions shall be installed to monitor the actual negative pressure on a continuous, uninterrupted manner for the duration of the Type 3 removal project. Monitoring shall be between the enclosed work area and an adjacent occupied area.

Intermittent background air monitoring is required outside of the work areas during periods of active removal. This would consist of at least one air sample outside of the work area on a daily basis for the duration of the abatements, on days when work is actively occurring.

5.2. Overview and Scope - Type 2 Work For Ductwork

There are plans to add additional ductwork and openings will need to be made through cinder block walls to accommodate this. Openings for this purpose will be approximately 10" x10".

The work to provide wall openings for new ductwork will be completed using Type 2 (Moderate Risk) abatement procedures generally, or as modified by this specification.

A Type 2 enclosure shall be built on either side of the wall to be cut, with gowning chambers for each side so that access is available to both sides of the wall.

Intermittent background air monitoring is required within the building outside of the work areas during periods of active removal. This would consist of at least one air sample outside of the work area on a daily basis for the duration of the abatements, on days when work is actively occurring.

6.0 GENERAL REQUIREMENTS FOR TYPE 2 AND TYPE 3 ABATEMENTS

- 6.1. This section provides general requirements for abatements as outlined in *Safe Work Manitoba Guide for Asbestos Management* and/or as modified in these procedures¹. This report may include precautions in addition to the minimum requirements in the guideline for a Type 2 or 3, based on a site-specific evaluation of the risk. Additional requirements are described in subsequent sections.
- 6.2. Prior to the start of any Type 2 or Type 3 removal, 5-day advance notification must be provided in writing (e.g., e-mail) to the Workplace Safety and Health Division.
- 6.3. Notice should be provided by completed an online form, which can be accessed at: www.manitoba.ca/labour/safety/asbestos
- 6.4. The contaminated area must be identified by clearly visible signs warning of the asbestos work and hazards. These signs should be placed on gowning chambers constructed.
- 6.5. Any asbestos abatement activities must be performed by qualified contractors with training in the applicable activities, as well as familiarity with the applicable guidelines published by the Manitoba Department of Labour Workplace Safety and Health Division.
- 6.6. These procedures are to be considered as guidelines only. Where federal, provincial, or local requirements pertaining to asbestos conflict with these procedures, the more stringent requirement shall generally apply.
- 6.7. Regarding the selection, use and care of respirators, refer to the current edition of the Canadian Standards Association (CSA) standard CSA Z94.4. The employer must provide supervision to ensure that respirators are being properly used.
- 6.8. As with all work practices, employers must ensure that the workers are knowledgeable of the hazards associated with asbestos and properly trained in the removal of such materials.

¹ *Guide for Asbestos Management*. Safe Work Manitoba. May 2017.

7.0 OCCUPANCY

All occupants who may be affected by the ACM must be informed and provided with information on how to avoid the potential health hazard in the building.

The abatement work will be occurring within a work space and other workers and trades may be present. The building will be occupied during the execution of this work. Signs will be posted to warn of the asbestos abatements that are occurring.

8.0 SET-UP AND CONTAINMENT REQUIREMENTS - GENERAL

- 8.1. Hand and face washing facilities must be available to workers in the work area and workers must wash before leaving the work area.
- 8.2. Rooms within the decontamination unit should be of adequate size for their intended use.
- 8.3. Each airlock chamber must be separated by overlapping flaps of polyethylene, held securely in place. Each flap should be approximately 2/3 the doorway width and should be weighted so that flaps fall into place on their own accord.
- 8.4. Shower must be supplied with warm water. Soap/shampoo and clean towels must be provided.
- 8.5. Provide sump pumps or other appropriate water pump to discharge waste water from shower, and direct to a sanitary sewer drain.
- 8.6. The negative pressure enclosure must be constructed of two layers of a minimum of 6-mil polyethylene, or other similar material, with polyethylene on the floor. Each layer must be sealed and secured independently.
- 8.7. The negative pressure enclosure must be kept at a minimum pressure differential of -0.02 inches of water gauge relative to the air outside of the enclosure at all times during the work by use of a ventilation unit equipped with a HEPA filter.
- 8.8. Electrical circuits inside the contaminated area must be deactivated unless equipped with ground-fault circuit interrupters.
- 8.9. All mechanical ventilation in the contaminated area must be disabled, except for the ventilation required to maintain the negative pressure.
- 8.10. Eating, drinking, chewing or smoking is prohibited in the work area.
- 8.11. Negative pressure HEPA-filtered fan units shall exhaust air out of the building for the duration of the cleanup, and must remain running until after post-removal inspections and clearance sampling have been completed, and have confirmed that it is appropriate to remove containment.

9.0 SET-UP AND CONTAINMENT - WORKSHOP/GARAGE

- 9.1. Construct a Type 3 negative pressure enclosure to encompass the entire workshop area and a portion of the adjacent garage area, in a such a way to encompass the entire work area required to remove portions of the demising wall between these two areas to accommodate the planned renovations.
- 9.2. Gowning and decontamination chambers shall be constructed at the entrance to the enclosure, at the south end of the workshop, where the overhead and man doors are located.
- 9.3. A worker decontamination unit must be connected to the enclosure to handle workers moving into and out of containment.
- 9.4. A separate waste decontamination unit must also be connected to the enclosure to handle removal of waste from the work area.
- 9.5. The personnel decon unit must consist of interconnecting rooms including:
 - A cleaning room (dirty chamber nearest to work space)
 - A holding room (shower Room)
 - An equipment room (clean chamber nearest to occupied space)
- 9.6. The waste decon unit must consist of interconnecting rooms including:
 - A cleaning room (dirty chamber nearest to work space)
 - A holding / transfer room
 - A clean room (clean chamber nearest to occupied space)
- 9.7. Workers leaving the enclosure must remove bulk contamination (HEPA/wet wipe) their protective clothing and respirators. In the first chamber (nearest to work area), workers will remove protective clothing (not respirators), then pass into the shower chamber and shower thoroughly. Once showered, they move into the clean chamber (nearest the exit), remove their respiratory protection, put on regular street clothes, and then exit the chambers. Respirators can be removed during showering, once they are cleaned, in order to shower fully.
- 9.8. For the workshop area, walls defined the work area. Cover walls and floors with polyethylene sheeting.
- 9.9. For the garage area, an additional containment wall will be required in the garage area. This wall must be well-constructed and secure (project potentially 2 weeks or longer) and be built for the full height of the space. Wall must be covered by two independent layers of 6-mil polyethylene sheeting, with seams overlapped (12") and securely taped. The bottom eight feet (8') of the wall shall be reinforced with 5/8" plywood on the outside (clean side) of the wall, to minimize unintentional breaches or damage during the project.
- 9.10. Air handlers serving the workshop and garage areas should be disabled during execution of the work.

- 9.11. Cover all air handling supply diffusers and return grilles within the space. There are perforations in the large round duct at the north end of the workshop and this needs to be securely covered.
- 9.12. The negative pressure fan unit shall exhaust out of building continuously for the duration of the work. Negative air should be drawn from the work space from a location that is as far from gowning entrance as possible; this would be from the NW corner of containment in the garage area.
- 9.13. Remove all equipment from the work area. Cover any immovable equipment or cabinets which must remain in place.
- 9.14. Cabinets and electrical conduits attached to the block wall to be removed can be removed prior to the start of the work. A HEPA vacuum must be available.
- 9.15. Use 6 mil poly to cover the floor and walls throughout the containment area to allow for easier cleaning of dust and debris in these areas.

10.0 SET-UP AND CONTAINMENT - DUCTWORK PENETRATIONS

- 10.1. Construct a Type 2 negative pressure on either side of the wall where cut/opening will be made.
- 10.2. Gowning and decontamination chambers shall be constructed at the entrance to each enclosure. A single gowning chamber is sufficient in this case.
- 10.3. The work planned within these negative pressure enclosures is short duration (1-2 days) and there is little ACM waste to be removed.
- 10.4. The negative pressure fan unit shall exhaust out of the building.

11.0 PREP INSPECTION REQUIREMENTS

- 11.1. The containment must be inspected by the Asbestos Abatement Consultant prior to the start of the work to remove or otherwise disturb the ACM. Do not remove cinder block walls or any other ACM materials prior to acceptable prep inspection.
- 11.2. Once containment is in place, work to disturb/remove the ACM may begin.
- 11.3. Only persons wearing protective clothing and respiratory protection are allowed to enter the contaminated area. For Type 3 removals, everyone must wear a minimum full-face powered air-purifying respirator (PAPR) with HEPA (P100) cartridges unless personal air sampling is performed inside the contaminated work area. Protective clothing (disposable Tyvek coveralls, with hood) must be worn.
- 11.4. From the start of the work up until all related work has been completed, the building owner (or building management) will provide the Asbestos Abatement Consultant with the authority to inspect work for compliance with applicable legislation and adherence to requirements as outlined in the specification for the work.
- 11.5. Requirements of the negative pressure enclosure:

- Must be constructed of two layers of 6-mil poly with polyethylene on the floors.
- Must have at least four air exchanges per hour and a minimum pressure differential of -0.02 inches of water gauge relative to outside the enclosure.
- For Type 3 project, a differential pressure monitor capable of logging pressure readings or alarm conditions must be installed to monitor the actual negative pressure on a continuous uninterrupted basis, for the duration of the project.
- Must be kept under negative pressure for the duration of the work (overnight and on weekends)
- All air passed from the negative pressure enclosure must be passed through a HEPA filter and exhausted outside of the building.
- If air cannot be exhausted outside of the building, DOP testing would be required for the negative air unit, with test completed onsite and only with prior approval from the City of Winnipeg.
- All mechanical ventilation inside the negative air enclosure must be disabled. Air supply ducts/diffusers must be securely covered.
- Ensure that asbestos dust cannot escape at points where pipes and conduits pass out of the working area.

11.6. Outside Work Area- Requirements:

- Relevant training or certification documents available onsite
- Onsite supervisor and workers must be trained
- Negative Air Machines (NAMs) operating continuously
- Onsite HEPA filter integrity testing available if exhausted inside the building
- -0.02" H₂O or better on manometer (or good draw noted for flaps)
- Air flow - outside to inside is adequate
- All chambers separated by airlocks
- Personnel Decon Unit - 3 stages with shower
- Waste Decon Unit - 3 chambers
- Self-closing flaps/doors
- Appropriate PPE available, including Tyvek suits.

11.7. Inside Work Area:

- Air handling system shut down or modified to prevent further disturbance
- Critical barriers - 2 layer 6 mil
- Air cleaning equipment - HEPA filters properly installed, equipment operating, maintained adequately, etc.
- Adequate equipment in place to ensure 4 air changes per hour
- No seams present (wall/floor, wall/ceiling, 12" overlap)

- Amended water being used (surfactants) before ACM is removed

12.0 EXECUTION OF WORK

12.1. Scope of Work - Workshop/Garage

- 12.1.1. Within the Type 3 containment, remove cabinets and unnecessary equipment or materials, if not already completed.
- 12.1.2. Consideration needs to be given to the sprinkler systems and alarms located on the ceiling. Note the location of sprinklers and ensure that they are not disturbed during the work. If necessary, alarms/sensors and sprinkler heads may be covered during periods of work, but should be uncovered at the end of each shift, prior to leaving.
- 12.1.3. Additional supports for plumbing lines, including lines associated with a hot water tank, will become necessary throughout the execution of the work.
- 12.1.4. Remove the cinder block wall as planned.
- 12.1.5. Remove all pipe elbows, fiberglass insulation (any mastic may contain asbestos) from pipes within the containment.
- 12.1.6. Remove old ventilation ducts in the paint booth. Cap the ducting near to the ceiling where ductwork penetrates the roof, leaving the portion of duct that penetrates through the roof in place, but capped.
- 12.1.7. Place all ACM waste into 6-mil polyethylene bags as directly as possible, and debris must not be allowed to accumulate on the ground.
- 12.1.8. And debris on the ground must be wet and shall not be allowed to dry.
- 12.1.9. The cinder blocks removed should be bagged and handled as ACM waste.

12.2. Scope of Work - Ductwork

- 12.2.1. Within the Type 2 containments constructed to accommodate cutting walls for HVAC ductwork, remove cinder blocks as necessary based on plans.
- 12.2.2. The location of the cuts shall be marked prior to constructing chambers.
- 12.2.3. Prior to removal of bricks, drill at least two (2) small holes in the cinder block(s) above the area to be removed, and inject spray foam insulation into this space in order to minimize the outflow of loose-fill vermiculite insulation as bricks are being removed.
- 12.2.4. A HEPA vacuum shall be running as blocks are cut or removed, to be able to collect vermiculite, which may spill out.
- 12.2.5. The void space of the cinder block wall where the opening has been made must be sealed/encapsulated.

- 12.2.6. For the opening created, install of steel lintel or equivalent following National Building Code of Canada.

12.3. General Work Requirements

- 12.3.1. Grinding, cutting, drilling, sanding or otherwise abrading of the asbestos-containing- material (ACM) with a power tool is prohibited unless the power tool is equipped with a HEPA filter. Dust control measures must be employed including misting the material with water and the use of a HEPA vacuum.
- 12.3.2. All asbestos containing material and/or contaminated material must be double-bagged in 6-mil polyethylene bags, labeled as “asbestos waste”, before removal from the contaminated area.
- 12.3.3. Mist all material to be removed with a water solution amended with soap (or other approved solution). Continue to mist any suspect materials during demolition and minimize the accumulation of dust and debris
- 12.3.4. The work area(s) shall be cleaned frequently while the work is proceeding. Dry sweeping or compressed air must not be used to clean-up or remove dust and debris.
- 12.3.5. The HEPA vacuum must be of industrial quality, intended for the purposes of abatement by the manufacturer and be fitted with a HEPA filter which is at least 99.97% efficient in collecting a 0.3 micrometer particles.
- 12.3.6. Ensure that any ACM debris is cleaned up prior to the end of the work shift, prior to leaving.

12.4. Waste Decontamination

- 12.4.1. All persons must decontaminate their protective clothing and respirators by using a vacuum cleaner equipped with a HEPA filter prior to leaving the contaminated area. Contaminated protective clothing must be disposed of as asbestos waste.
- 12.4.2. All waste containing asbestos must be cleaned up frequently during and immediately after work by wet mopping procedures.
- 12.4.3. All bags of asbestos waste and contaminated protective clothing must be removed from the work area through a waste decontamination unit connected to the negative pressure enclosure.
- 12.4.4. Bags of asbestos waste and contaminated protective clothing must be removed from the work area using the following procedures:
- a) Remove any visible contamination on the outside of the bags in the work area.
 - b) Transfer the bags into the cleaning room.
 - c) Clean the outside of the bags with a damp cloth, place the bag into a second 6-mil bag, seal the outer bag and transfer the double bag to the holding room (pass double-bagged waste through shower).

- d) The double bagged waste is then removed from the holding room into the equipment room and out of the work area. This is completed by someone entering from outside containment.

12.5. Final Clean-Up

- 12.5.1. Once all planned removal work has been completed, the entire space must be thoroughly HEPA vacuumed and then wet wiped in a systematic manner.
- 12.5.2. Clean from top to bottom, and from the farthest point towards the exit chambers to avoid re-contaminating previously cleaned surfaces. Pay special attention to horizontal surfaces, including voids or other areas where dirt and water can accumulate. Forced air should be used to ensure dust is removed from all areas, especially corners.
- 12.5.3. Once area is visibly clean, some consideration should be given to removing polyethylene sheeting that was in place to cover equipment or floors. If polyethylene has become damaged, or has become unsealed from its original state, then this polyethylene should be removed to allow for additional cleaning. Do not remove any sheeting in place for critical barriers, including polyethylene covering ductwork.
- 12.5.4. Following final clean, all unfinished surfaces within the area shall be sprayed down with an ACM encapsulant product, such as Chil-Lock or an equivalent product intended for use as a post-asbestos abatement sealer.
- 12.5.5. The enclosure shall remain in place, under negative pressure, until acceptable inspection and clearance air sampling results have been obtained.

12.6. Dismantling and Tear- Down

Before the negative pressure enclosure, worker decontamination unit and the waste decontamination unit may be removed or altered:

- a) the contaminated areas must be decontaminated using a combination of wet wiping and HEPA vacuuming
- b) there must be no visible trace of asbestos, any debris or dust
- c) a lock down agent must be applied to the walls, ceilings and floors and wherever possible to prevent any remaining fibers from becoming airborne
- d) final air clearance samples must be collected and the results confirmed to be acceptable for dismantling the enclosure

13.0 DISPOSAL REQUIREMENTS

13.1. Labeling and Isolation

- All containers of asbestos waste must be labeled in accordance with Part 35 of the *Workplace Safety and Health Regulation*
- The label on the container should include:
 - a) a product identifier
 - b) information on the safe handling of the controlled product
- Asbestos waste awaiting disposal must be stored so that containers will not be damaged.

13.2. Transport of Waste

- Written instructions on the actions to be taken in the event of a spill must be issued to drivers
- Workers must be trained in the procedures for cleaning up a spill
- Clean up procedures must be carried out immediately in the event of a spill
- All vehicles used in the transport of asbestos waste must be cleaned after unloading, as needed.

14.0 MONITORING AND CLEARANCE

14.1. Differential Pressure Monitoring

A differential pressure monitor and data logger (e.g., Omniguard or equivalent) shall be installed to continuously monitor actual differential pressure between Type 3 Workshop work area and an adjacent occupied space. Unit shall be installed prior to acceptable prep inspection and shall remain in place for the duration of the project.

Enclosure must be kept to a minimum of $-0.02''$ H₂O for the duration of the project. Any alarm conditions or concerns will be addressed, and the data shall be reviewed each day and be summarized in the final report.

14.2. Background/Perimeter Sampling

Air sampling shall be completed on a daily basis in the area outside the negative pressure enclosure, on each day of active abatement during periods of active removal.

Air sampling shall be completed by the Asbestos Abatement Consultant, and the Contractor must coordinate with the Asbestos Abatement Consultant regarding scheduling of abatement activities.

Background or perimeter monitoring samples shall be a minimum of 1,350 L.

If abatement is completed in a single day, then one background sample would be required, in addition to clearance sample(s).

If two or more active abatements are occurring with common adjacent areas, a single background or perimeter sample would be acceptable, however if abatements are distant or there are multiple adjacent areas, then additional background monitoring samples may be warranted.

14.3. Clearance Inspection and Sampling

Clearance inspections must be completed for each containment, to ensure that all ACM have been adequately addressed. The inspections shall be completed by the Asbestos Abatement Consultant, and will include air sampling at the completion of the removal, to determine the effectiveness of the removal and clean-up.

Once all ACM has been removed, a final inspection within the enclosure will be completed, with clearance sampling using PCM/TEM methodology.

For Type 3 clearance inspection, aggressive clearance sampling practices will be used during clearance sampling. This involves forced air blown at surfaces within the containment to ensure any settled materials become airborne, and provides a higher degree of assurance that containment is clean.

For the Type 2 enclosures constructed to permit cutting holes in walls for new ductwork, the containment on each side of the wall will require a separate air clearance sample, unless spaces are adjoining through a doorway or similar situation.

Following asbestos abatement activities, airborne asbestos fiber concentrations must be reduced to a maximum concentration of 0.01 f/cc of air for all forms of asbestos before the negative pressure enclosure is removed and workers and others are allowed to reoccupy an area where asbestos has been removed.

Clearance air samples will be taken within the enclosure, and will be analyzed according to PCM (NIOSH 7400). For final clearance sampling of either Type 2 or Type 3 enclosures, the total sample volume collected must be at least 3,850 L. The total sample volume required may be divided across replicate clearance samples, to provide a better representation of all areas of the enclosure, to minimize potential for overloading sample cassette, and to ensure clearance samples collected comply with sample requirements in NIOSH 7400.

If results do not meet the post-abatement clearance specification based on PCM analysis, follow-up analysis using the TEM methodology (NIOSH 7402) may be required. Additional workspace cleaning followed by re-inspection and re-sampling may also be completed.

Additional inspections may also be completed throughout the clean-up process in order to evaluate how the clean-up is progressing, and to identify additional areas of concerns or to modify current procedures for the clean-up.

14.4. Completion

Once passing air clearance results have been obtained, enclosures constructed can be dismantled and the area can be re-occupied.

Negative air machines shall be left running during teardown, to the extent possible. Once negative air machines are turned off, dispose of pre-filters and intermediate filters by carefully placing them into 6-mil asbestos waste bags, and disposing as asbestos waste.

Containment walls shall be carefully folded inward and rolled/folded towards the center of the containment to contain any materials held to polyethylene material.

All polyethylene used in conjunction with the abatement shall be placed in 6-mil asbestos waste bags and disposed of as asbestos waste.

A final PCM clearance report will be provided at the completion of the overall abatement project.

Where insulation has been removed, the building owner may be required to re-insulate ductwork, water lines or drain lines where insulation is being removed as part of the abatement project.

15.0 **REGULATIONS/REFERENCES**

Guide for Asbestos Management. Safe Work Manitoba. May 2017.

NIOSH 7400 – Asbestos and Other Fibers by PCM. Issue 2 (August 15, 1994). NIOSH Manual of Analytical Methods (NMAM), Fourth Edition. National Institute of Occupational Safety and Health

CSA Z94.4 Selection, use and care of respirators. Canadian Standards Association (CSA) standard.