



FINAL
Asbestos Management
Program (MUMC)
Part B - Procedures

1200 Main Street West, Hamilton,
Ontario

Prepared for:

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GLOSSARY

Amended Water	Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
Asbestos-Containing Material(s) (ACM)	A material that contains 0.5% or more asbestos as measured by U.S. Environmental Protection Agency Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, June, 1993.
Asbestos	Any of the following fibrous silicates: Actinolite; Amosite; Anthophyllite; Chrysotile; Crocidolite; Tremolite.
Asbestos Work Area	Area where work is being performed which will or may disturb ACM including overspray and fallen material or settled dust that may contain asbestos.
Competent Worker	In relation to specific work, means a worker who, is qualified because of knowledge, training and experience to perform the work is familiar with the Act and with the provisions of the regulations that apply to the work, and has knowledge of all potential or actual danger to health or safety in the work.
Encapsulation	The application of a liquid sealant to asbestos-containing materials; the sealant may penetrate and harden the material (penetrants) or cover the surface with a protective coating (bridging sealants). Also called encasement. This is generally not advisable.
Enclosure	Enclosure of ACM means the construction of solid enclosure (walls, ceiling, bulkhead etc.) around ACM, or An Enclosure means the site isolation including hoarding walls, polyethylene sheeting and seals that isolates an Asbestos Work Area.
Friable Material	Material that: when dry, can be crumbled, pulverized or powdered by hand pressure or is crumbled, pulverized or powdered.
Glove Bag Removal	A method of removing friable insulation from a piping system using a prefabricated bag which isolates the section of insulation being removed. This is a Type 2 Procedure.
HEPA Filter	High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.



HEPA Filtered Negative Pressure Unit	Portable air handling unit which extracts air directly from the Asbestos Work Area and discharges the air to the exterior of the building after passing through a HEPA filter.
JHSC	Joint Health and Safety Committee.
MAESD	Ministry of Advanced Education and Skills Development.
MOE	Ontario Ministry of the Environment.
MOL	Ontario Ministry of Labour.
Phase Contrast Microscopy (PCM)	A method which uses an optical microscope to determine airborne fibres, normally in an occupational setting. Particles are observed for shape and size. Results are presented as a number of fibres per cubic centimetre or millilitre of air (f/mL). The method of analysis in Ontario is based on the US National Institute for Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7400, issue 2, Asbestos and Other Fibres by PCM (August 15, 1994).
Transmission Electron Microscopy (TEM)	A method which uses an electron microscope to determine airborne asbestos fibres. Results are presented in fibres per cubic centimetre of air (f/cc). The method of analysis in Ontario is The U.S. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7402, Issue 2: Asbestos by TEM (Aug 15, 1994).
Type 1, 2 and 3 Procedures	Procedures defined under Ontario Ministry of Labour Regulation 278/05. The specific operations and their classification into these procedures are described under the Classification of Work Section.
US EPA	United States Environmental Protection Agency.



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Part B - Procedures**

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1.0 PURPOSE AND SCOPE

The Asbestos Management Program (AMP) provides information and procedures for Asbestos Management in McMaster University Medical Centre (MUMC), 1200 Main Street West, Hamilton, Ontario. The AMP applies to all Hamilton Health Sciences (HHS) staff as well as all service providers and contractors performing work in Hamilton Health Sciences facilities.

The AMP consists of two parts; PART A outlines the policies, purpose, and responsibilities and PART B (this document) includes the procedures to be followed when completing asbestos related work in the facility.

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Master Template for Asbestos Management Program, July 19, 2017

APPENDIX A
Bulk Sample Collection Procedures



BULK SAMPLE COLLECTION PROCEDURES

1.0 OBJECTIVES

To obtain a sample for analysis to determine if asbestos is present within a material.

To determine the type of asbestos and the quantity of asbestos of each type.

Sampling of vermiculite is specifically excluded from these procedures.

2.0 EQUIPMENT AND SUPPLIES

- Pen and Sharpie marker.
- Retractable knife (with extra blades).
- Hook knife.
- Flashlight and batteries.
- Screwdriver(s) with multiple bits.
- Small hammer.
- Sample bags.
- Insulation tape or duct tape.
- Spray bottle.
- Wipes for cleaning tools so as to not contaminate subsequent samples.
- NIOSH approved half-face respirator with P100 filters.

3.0 SAMPLE COLLECTION

A member of the JHSC must be notified prior to any sampling being conducted and invited to be present at the start of sampling.

Only those persons needed for sampling should be present in the immediate area.

Where necessary, provide a drop sheet below sample location if debris or dust may be generated by sampling operation (e.g. below a ceiling tile if sprayed fireproofing is above).

Use new tools, or clean the re-used tools to be used with a sanitizing wipe prior to sample collection. Wipe or wash again prior to each subsequent sample.

Spray the material with a light mist of water if necessary to prevent fibre release during sampling. Do not disturb the material any more than necessary. Note that using water may delay the receipt of sample results as samples cannot be analyzed if wet.



Each homogeneous material should be sampled separately. Number of samples required is in Table 1 of O. Reg. 278/05 and is as follows:

Type of Material	Size of Homogeneous Material	Minimum Number of Bulk Samples
Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise, such as acoustical plaster on ceilings, fireproofing materials on structural members and plaster	Less than 90 square metres	3
	90 or more square metres, but less than 450 square metres	5
	450 or more square metres	7
Thermal insulation, except as described below	Any size	3
Thermal insulation patch	Less than 2 linear metres or 0.5 square metres	1
Other materials	Any size	3

Collect the sample by penetrating the entire depth of the material to the underlying substrate since it may have more than one layer. Examples of materials with more than one layer include plaster, sweatwrap with tar paper, and parging cement over other insulations, etc. The following points are exceptions to this rule.

- When collecting drywall joint compound samples, do not sample the paper on the drywall or the drywall itself. To ensure that the drywall joint compound itself is sampled, collect the sample at previously damaged outside corners or above ceiling where unpainted.
- When sampling texture coat that is applied in a thin layer to drywall, try to ensure that you only collect a sample of the texture coat and not any drywall compound beneath that may skew the sample result. Try to sample at an area that is 1'x 1' away from a corner (and likely away from drywall joint compound), or sample overspray above ceiling. Do not sample too deep, trying only to remove the texture coat itself.
- When collecting samples try to minimize damage to finishes. A piece a big as your thumbnail is all that is required.
- When sampling VAT, try to obtain a sample of the mastic whenever possible. If the survey is for pre-construction, the mastic must be analyzed. Add this note to the transmittal.



If pieces of material break off and fall during sampling, remove the debris by wet wiping and place wipe in sample bag for disposal.

Scrape directly into, or place sample into a Ziploc bag and seal closure strip. Write the following information on the sample bag:

- Sample Number. Ensure that samples of the same homogenous material are numbered the same number but with a different letter to signify it is a different sample of the same homogeneous material (e.g. 001A, 001B, and 001C for three samples of the same type of ceiling tile).
- Date (year/month/day).
- Collected by.
- Company name.
- Material.
- Location. Include building name, room name, location number, type of system etc.

Temporarily seal any openings created to collect the sample, for example, with metal foil tape or duct tape wrapped completely around pipe insulation where the jacket was cut.

4.0 PERSONAL SAFETY

The use of a respirator is recommended for all sampling of materials. However, sampling can be performed without a need for one but depends on care used and the friability of the material being sampled.

Wash your hands after sampling, and you must wash your hands prior to eating drinking or smoking.

5.0 SAMPLE SUBMISSION

Samples must be analyzed at only NVLAP or AIHA certified laboratories. Acceptable labs include:

Pinchin Ltd.. Mississauga Laboratory, 2470 Milltower Court, Mississauga ON, L5N 7W5, Contact: Kendra Bertuzzi, (905) 363-1433 (Direct line).

Complete the Bulk Sample Transmittal. On the transmittal ensure that you instruct the lab to use the Stop Positive approach.

6.0 SAMPLE HANDLING AND SHIPPING

Include the Bulk Sample Transmittal. Bulk samples do not require special handling (temperature, pressure etc.).



7.0 ANALYSIS

The analytical method follows the Ontario Ministry of Labour Code for the Determination of Asbestos from Bulk Samples, August 1985 and U.S. EPA Method 600/R-93/116 dated July 1993.

Analysis is to be completed using a stop positive approach. Only one result of greater than 0.5% asbestos content is required to determine that a material is asbestos-containing, but all samples must be analyzed to conclusively determine that a material is non-asbestos (O. Reg. 278/05). The laboratory will stop analyzing samples from a homogeneous material once greater than 0.5% asbestos is detected in any of the samples of that material. All samples are analyzed if no asbestos was detected.

8.0 INTERPRETATION OF BULK SAMPLE RESULTS

Any material containing more than 0.5% asbestos is considered an asbestos-containing material in Ontario.

9.0 NOTIFICATION OF STAFF

The Hazardous Materials Specialist will be responsible to distribute the laboratory results to the Asbestos Sub-Committee and the site Joint Health and Safety Committee. The manager who requested sampling or who manages the affected work area will also be notified. It is the manager's duty to notify staff of any changes.

APPENDIX B
Type 1 Asbestos Work Procedures



TYPE 1 ASBESTOS WORK PROCEDURES

These procedures are to be followed by workers and contractors performing the following work at HHS buildings.

- Installing or removing ceiling tiles which are an asbestos-containing material, if the tiles cover an area less than 7.5 square metres and are installed or removed without being broken, cut, drilled abraded, ground, sanded or vibrated and friable asbestos-containing material is NOT likely to be lying on the surface of the ceiling tile.
- Installing or removing non-friable asbestos-containing material, other than ceiling tiles, if the material is installed or removed without being broken, cut drilled, abraded, ground, sanded or vibrated.
- Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,
 - The material is wetted to control the spread of dust or fibers, and
 - The work is done only by means of non-powered hand-held tools.
- Removing less than one square metre of drywall in which joint-filling compounds that are asbestos-containing material have been used.

These Type 1 Asbestos Procedures assume the non-friable material can be removed with relatively little loose dry dust released. Generation of debris is permissible as long as the debris can be well wetted before being removed. If the work will release more than a trivial amount of dry loose dust, do not proceed further with work. The Hazardous Materials Specialist or Project Designate will determine which of Type 1, 2 or 3 procedures are appropriate.

1.0 EQUIPMENT

All equipment must be on site before proceeding.

1.1 HEPA Vacuum

Use of a vacuum is optional. Wet cleaning methods may be used in place of a HEPA vacuum. If a vacuum is used, it must be equipped with a high efficiency particulate aerosol (HEPA) filter. The vacuum must only be opened to be cleaned or dislodging of blocked objects in an enclosure following Type 2 procedures. The vacuum exterior should be carefully wet cleaned after each use or after each emptying.



1.2 Respirators

Use of a respirator is optional. However, a respirator is recommended for all Type 1 work. The employer will supply at the workers' request a half face respirator with P100 (HEPA) filters, with training on use and qualitative fit testing. Respirator must be used according to written use procedures provided to worker as per training procedures. Filters must be changed after 16 hours of wear or sooner if breathing resistance increases as filters become damp. No person using a respirator shall have facial hair that affects the seal between respirator and face.

1.3 Protective Clothing

Disposable protective clothing is optional. The employer will supply at the workers request. Non-disposable clothing with visible asbestos contamination shall be cleaned with a HEPA vacuum and laundered as asbestos contaminated. Disposable clothing and respirator filters are to be disposed of as asbestos waste.

1.4 Other Equipment

The following equipment will also be required to perform the work.

- 6 mil polyethylene to serve as a drop sheet.
- Pump sprayer with misting nozzle or alternative method to wet material.
- Labelled yellow asbestos waste bags (6 mil) - for all asbestos waste, disposable equipment, plastic, etc.
- Small tools and cleaning supplies - e.g. scouring pads, sponges, brushes, buckets, etc.

2.0 OTHER PROTECTIVE MEASURES

Do not eat, drink or smoke in the work area.

Upon leaving the work area, proceed to the washroom and wash all exposed skin on hands and face.

3.0 SCHEDULING OF WORK

Schedule work when occupants are absent. If persons are present, do not start work.

If work is required on an emergency basis and the area is occupied, the Hazardous Materials Specialist or Project Designate is to advise occupants to vacate area until work is complete and clearance is given to return.



4.0 PREPARATION

Before disturbing non-friable asbestos materials, cover floor (vinyl tile excepted) and surfaces below work with polyethylene sheeting as appropriate to catch debris.

Wherever dust on a surface is likely to be disturbed, pre-clean and remove using a HEPA vacuum or damp cloth.

5.0 EXECUTION

5.1 Removal of Vinyl Asbestos Floor Tile

Do not use electric powered scrapers.

Wet material with amended water.

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

Continue removal of tiles using hand tools, removing tiles intact wherever possible. When adhesive is spread heavily or is quite hard, it may prove easier to force scraper through tightly adhered areas by striking scraper handle with a hammer using blows of moderate force while maintaining scraper at 25° to 30° angle to floor. When even this technique cannot loosen tile, removal can be simplified by heating tile thoroughly with a hot air gun until heat penetrates through tile and softens the adhesive.

When tiles are removed, place into asbestos waste receptor. Do not break into smaller pieces.

After removal, scrape up adhesive remaining on floor with a hand scraper until only a thin smooth film remains. Where deposits are heavy or difficult to scrape, a hot air gun may be used. Deposit scrapings in the asbestos waste disposal bag. Do not dry scrape surface of adhering pieces of tile. Do not use powered electric scrapers.

On completion of removal, vacuum clean floor with HEPA vacuum or wet mop.

Dispose of the mop head as contaminated waste. Alternatively, store this and other materials that cannot be cleaned in asbestos waste bags until next use (open only inside work area.)

5.2 Installing, Cutting, or Drilling Non-Friable Asbestos Materials

Work using power tools or power equipment must not be performed as Type 1 work.

Where possible wet all materials to be disturbed. If wetting is not possible use Type 2 procedures.

Immediately place waste in asbestos waste container. Clean area frequently during work with HEPA vacuum or by wet methods.



At completion of work, clean drop sheets and dispose of as asbestos waste.

5.3 Removal of Other Non-Friable Asbestos Materials

The Type 1 procedures apply only to materials that can be removed intact, or in sections, without producing a pulverized or powdered waste. This method is most applicable to transite and small quantities of lay-in ceiling tiles.

Wet all material to be disturbed with amended water.

Undo fasteners necessary to remove material. Whenever possible remove asbestos cement panels intact. Break only if unavoidable. If broken, wet freshly exposed edges.

Where sections are adhered to the substrate, wet material and use hand scraping to remove adhering material.

Place removed material into asbestos waste receptor. Clean surrounding surfaces and asbestos work area frequently with HEPA vacuum or with wet methods (i.e. damp cloth disposed of as asbestos waste after cleaning).

Drop sheets shall be cleaned and disposed of as asbestos waste.

5.4 Waste Transport and Disposal

Place waste into asbestos labelled disposal bag, seal with tape, clean the exterior of the bag with a clean cloth, and place into a second clean asbestos labelled bag, also to be sealed with tape.

HHS will provide a storage area for holding minor amounts of asbestos waste in sealed containers.

Garbage containers shall be labelled and assigned exclusively for asbestos waste. Contractors will be responsible for storage and disposal of any waste that is more than two asbestos waste bags.

When waste is removed from site, collect the completed waste waybills from the disposal firm. For work performed by a contractor, the contractor will complete and provide to the Hazardous Materials Specialist or Project Designate copies of a waste manifest. Waste generated by staff will be stored at a secure location until sufficient accumulates for a waste pick-up. Staff should request the room number for internal storage from the Hazardous Materials Specialist or Engineering. If the container is full notify Engineering.

APPENDIX C
Type 2 Asbestos Work Procedures



TYPE 2 WORK PROCEDURES

These procedures are to be followed by all maintenance personnel and contractors performing the following work at HHS buildings.

- Entry into any ceiling space, wall chase or other area in which friable asbestos-containing debris is present.
- Removal of any part of a false ceiling if asbestos-containing debris is likely to be lying on the surface of the false ceiling.
- Removal of glued-on compressed mineral fibre tiles containing asbestos or removal of more than 7.5 square metres of lay-in tiles of this type at one time.
- Clean up of asbestos-containing debris from mechanical insulations or sprayed fireproofing.
- Enclosure of friable material containing asbestos.
- Repair (such as application of tape or sealant or other covering) of any extent of asbestos mechanical insulation.
- Removal of non-friable materials with hand-tools where the material has not been wetted.
- Removal of more than 1 square metre of drywall to which asbestos-containing compound has been applied.
- Removing asbestos-containing pipe insulation from a pipe, duct or similar structure using a glove bag. (See Appendix D)
- Cleaning or removing filters used in air handling equipment in a building that has asbestos-containing sprayed fireproofing.
- Removal of any extent of asbestos-containing vinyl sheet flooring. Note: If power tools such as grinders are required to remove all paper backing from the substrate Type 3 procedures must be utilized.
- Removal of minor amounts of friable asbestos-containing materials including, texture coat, sprayed fireproofing and mechanical insulation. (Minor removal is defined by most provincial regulations – in Ontario this is limited to wet removal of 1 square metre or less, or an equivalent amount of pipe insulation).

1.0 EQUIPMENT

Equipment required for the work must be on site before proceeding.



1.1 HEPA Vacuum

An asbestos-approved vacuum (HEPA filtered) equipped with brushes, fittings, etc. A vacuum can be opened to empty only by a fully protected worker within a Type 2 enclosure.

1.2 Respirators

Workers within the work area must wear an approved respirator. Respirators and filters will be provided by the employer, and individually assigned to workers. Respirator shall be a half-facepiece respirator with high efficiency (P100) filters, for all classifications of Type 2 work, except as follows: Full face piece air purifying respiratory or powered air purifying respirator with high efficiency (P100 or HEPA filters) shall be used for ceiling access with ACM debris on ceiling or for use of power tools equipped with HEPA filtered dust collector to cut, grind or abrade non-friable ACM. Respirators must be kept in position on the face during the entire time the worker is in the Type 2 Work Area. This is the period from the first removal of the ceiling tile, opening of hatches or the first disturbance of the asbestos material until the final cleaning of the area and the bagging of waste is completed. Change filters after 24 hours of wear or sooner if breathing resistance increases as filters become damp. No person wearing a respirator shall wear facial hair which affects seal between respirator and face.

1.3 Protective Clothing

All workers shall wear disposable Tyvek coveralls (or equivalent) with attached elasticized hood. Coveralls should be worn with the hood in place at all times. Suit and head cover shall remain in place until worker leaves the Type 2 enclosure or work area. Boot covers are required if wet wiping or HEPA vacuuming cannot effectively clean footwear. Disposable coveralls must be disposed of as asbestos waste at the end of each shift or at each break.

1.4 Other Equipment

Polyethylene (6 mil polyethylene) - to erect a total enclosure or to serve as drop sheet;

Wood framing or clips to support polyethylene sheeting, as appropriate to work area

Duct tape to fasten plastic enclosure to ceiling, walls, or to tape drop sheet to floor; 3/4" double-sided tape recommended for attaching polyethylene to T-bar ceiling

Labelled asbestos waste bag (6 mil) - for all asbestos waste, disposable suit, plastic for disposal, etc.

Pump sprayer containing water with wetting agent to wet asbestos as necessary; dilute wetting agent 2 oz. per gallon of water.

Asbestos warning signs



Cleaning supplies - e.g. scouring pads, sponges, brushes, buckets, etc.

Insulation repair supplies (lagging compound, cloth, PVC covers)

Encapsulating sealer, for brush or airless spray application

2.0 OTHER PROTECTIVE MEASURES

Do not eat, drink or smoke in the work area.

On completing clean-up of work area, use vacuum or wet cloth to clean hands, face, respirator and boots.

Remove protective equipment and proceed to nearest washroom to wash exposed skin on hands and face.

3.0 SCHEDULING OF WORK

Schedule work when occupants are absent. If persons are present, do not start work.

If work is required on an emergency basis and the area is occupied, the Hazardous Materials Specialist or Project Designate is to advise occupants to vacate area until work is complete and clearance is given to return.

4.0 PREPARATION

4.1 Enclosure Required

Shut down ventilation systems to and from the work area. Seal over all ventilation openings, diffusers, grilles, etc. with plastic and tape.

Where practical, clear areas of movable furnishings or equipment. This should include anything which occupants may wish to use during work period. Any furnishings or equipment not removed shall be adequately covered and sealed using 6-mil polyethylene and tape.

Construct enclosure using polyethylene sheeting, tape and glue. For small rooms, cover walls with plastic such that the complete room becomes the work area. For larger rooms, erect enclosure of 6-mil polyethylene of suitable dimensions to enclose the work area. If a suspended ceiling is present, the enclosure shall extend to the ceiling line. The enclosure shall be as airtight as conditions permit including the provision of a double overlapping flap at the entrance. The floor of the work area shall be a layer of minimum 6-mil polyethylene sealed to the plastic walls of the enclosure. Post warning signs at the entrance to the enclosure.

Use a HEPA vacuum or appropriately sized air unit equipped with HEPA filter to induce negative pressure inside work area. Vacuum should be outside the enclosure with hose inserted inside enclosure to extract air from enclosure.



Don protective clothing and respirator prior to disturbing any asbestos-containing materials in Type 2 enclosure.

4.2 No Enclosure Required

Shut down ventilation systems to and from the work area. Seal over all ventilation openings, diffusers, grilles, etc. with plastic and tape.

Where practical, clear areas of movable furnishings or equipment. This should include anything which occupants may wish to use during work period. Any furnishings or equipment not removed shall be adequately covered and sealed using 6-mil polyethylene and tape.

Post signs or caution tape to indicate the asbestos work area and identify an asbestos hazard and requirement for protective clothing for anyone entering the space. Identify a designated area for worker decontamination.

Don protective clothing and respirator prior to disturbing any asbestos-containing materials in Type 2 work area.

5.0 EXECUTION

To remove sprayed fireproofing perform the following:

- Erect site isolation and don protective clothing as per Preparation Section 4.1.
- Saturate the ACM with amended water. Scrape wetted ACM directly into waste containers.
- Do not allow ACM to fall to the floor of the enclosure.
- Clean all surfaces from which ACM has been removed with scouring pads, vacuuming or wet-sponging to remove all visible material after completion of removal of ACM.
- Maximum removal is 1 square metre of material.

To provide access into ceiling spaces where sprayed fireproofing or asbestos-containing debris is present perform the following:

- Erect site isolation and don protective clothing as per Preparation Section 4.1.
- Carefully remove one tile or small portion of ceiling and clean top of removed section with HEPA vacuum.
- Vacuum top of remaining ceiling while still in place.
- Do not break tile or allow tiles to drop to floor.
- Perform all work above ceiling inside Type 2 enclosure.

To remove mechanical systems insulation perform the following:

- Erect site isolation and don protective clothing as per Preparation Section 4.1.
- Wet any area of damage, then carefully cut jacket. Keep insulation surface wetted by mist of water with wetting agent.
- Remove insulation in large sections and place immediately in disposal bag.
- After all large pieces have been removed, saturate debris and clean all exposed surfaces with abrasive pads, sponges, cloths, etc.
- When only a section of the mechanical insulation is to be removed the remaining exposed ends must be sealed with appropriate cloth and lagging.
- Maximum removal is 1 square metre of material.

To repair mechanical systems insulation, perform the following:

- Don protective equipment as per Preparation Section 4.2.
- Use drop sheet under area of work to aid clean-up of any dislodged material. Plastic enclosure is not required.
- Mist any exposed insulation to wet surface and apply lagging paint and canvas or PVC jacketing as required.

To remove ceiling tiles perform the following:

- Erect site isolation and don protective clothing as per Preparation Section 4.2.
- Wet tiles and remove intact as much as possible and place immediately in disposal bag.
- After all large pieces have been removed, saturate debris and clean all exposed surfaces and support structure with abrasive pads, sponges, cloths, etc.

To remove more than 1m² of drywall perform the following:

- Erect site isolation and don protective clothing as per Preparation Section 4.2.
- Protect drywall around area to be removed by covering with polyethylene and taping seams to wall.
- Cut drywall and remove using non-powered hand-held tools. Place directly into 6 mil polyethylene waste bag, then into a second sealed bag.
- Remove all screws and fasteners in studs or strapping.
- Remove studs and strapping where specified. Clean metal studs and remove from Asbestos Work Area.



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

To remove vinyl asbestos sheet flooring perform the following:

- Erect site isolation and don protective clothing as per Preparation Section 4.1.
- Remove binding strips or other restrictive mouldings.
- Make series of cuts 100 to 200 mm (4" to 8") apart through top layers and about halfway through felt backing, parallel to wall.
- Pry up corner of a strip at end of room furthest from access to work area. Pull sheet back upon itself slowly and evenly along with any adhering paper backing which remains attached to top layers.
- Roll up strip (finished side out) into tight roll, tape or tie securely, and place into Asbestos Waste Container.
- Remove maximum of three strips before wet scraping residual exposed paper underpad.
- Remove remaining adhered underpad by wet scraping as follows:
 - Soak area with amended water applied by sprayer; Scrape off all remaining material; Place scrapings in asbestos waste container. Allow floor to dry and clean with HEPA vacuum.
 - Removed asbestos-containing materials should be placed directly into 6 mil polyethylene bags as they are removed. Avoid dropping material to floor wherever possible. After bulk removal is complete, brush clean completely, and wet wash the exposed surface.

To cut or drill into non-friable ACM using a power tool equipped with a HEPA filter perform the following: (wet method):

- Don protective equipment as per Preparation Section 4.20.
- Wet all material to be disturbed.
- Undo fasteners if necessary to remove material.
- Use hand held powered tools with a HEPA filtered dust collection device to remove, cut, grind, abrade, break or vibrate ACM.
- Scrape to remove any remaining material adhered to substrate.
- Place removed ACM directly into an asbestos waste container.



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

To cut or drill into non-friable ACM using a power tool equipped with a HEPA filter perform the following: (dry method):

- Don protective equipment as per Preparation Section 4.2 with full face piece air purifying respirator or powered air purifying respirator with high efficiency (P100 or HEPA filters) as per Respirator Section 1.2.
- Undo fasteners if necessary to remove material.
- Use hand held powered tools with a HEPA filtered dust collection device to remove, cut, grind, abrade, break or vibrate ACM.
- Scrape to remove any remaining material adhered to substrate.
- Place removed ACM directly into an asbestos waste container.

General for all Operations:

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

Frequently, and at regular intervals during the work, clean up dust and waste in the work area by wet mopping, placing in disposal bags, or by HEPA vacuuming.

Apply post removal sealer and coat surfaces from which asbestos material was removed.

At completion of work, decontaminate equipment, tools and materials used in the work area by wet cleaning or HEPA vacuum.

Dispose of drop sheets and enclosures by wetting the polyethylene, then folding into disposal bags. Do not reuse drop sheets or enclosures.

Before leaving work area, decontaminate shoes and protective clothing by using HEPA vacuum or damp wiping. When protective clothing is to be disposed of, it shall be decontaminated as above and placed in labelled disposal bags. Workers shall vacuum all exposed skin, suit and respirator, and proceed to nearest washroom to wash hands and face.



6.0 WASTE TRANSPORT AND DISPOSAL

Place waste into asbestos labelled yellow disposal bag, seal with tape, clean the bag, and place into a second clean bag. Seal outer bag with tape.

HHS will provide storage area for holding minor amounts of asbestos waste in sealed containers. Containers shall be labelled and assigned exclusively for asbestos waste.

When waste is removed from site, collect copies of the waste waybills from the disposal firm. For work performed by a contractor, the contractor will complete and provide to the Facility Manager copies of a waste manifest. Waste generated by personnel will be stored in a secure location until sufficient accumulates for a waste pick-up. Staff should request the room number for internal storage from the Hazardous Materials Specialist or Engineering. If the container is full notify Engineering.

APPENDIX D
Glove Bag Work Procedures



GLOVE BAG WORK PROCEDURES

These procedures are to be followed by maintenance staff and contract persons performing the removal of asbestos-containing pipe insulation using glove bag procedures work at HHS buildings.

NOTE: If more than a minor amount of insulation (more than 1 square metre) is to be removed a notification to the Ministry of Labour will be required.

1.0 EQUIPMENT

All equipment must be on site before proceeding with the work.

1.1 Single Use Glove Bag

A pre-fabricated plastic bag with air-tight sleeves and gloves permanently sealed to the bag to allow access to pipe insulation. Bag shall be equipped with valves or openings for vacuum hose and nozzle of water sprayer, a tool pound with a drain, a seamless bottom and a means of sealing off the lower portion of the bag.

1.2 Moveable Glove Bag

A Glove Bag as defined in 1.1 but equipped with a high strength double throw zipper and removable straps. Required if the bag is to be moved during the removal operation.

1.3 HEPA Vacuum

An asbestos-approved vacuum (HEPA filtered) equipped with brushes, fittings, etc. A vacuum can be opened to empty only by fully protected worker within a Type 2 enclosure.

1.4 Respirators

Workers using glove bag must wear approved respiratory protection. Respirators and filters must be provided by the employer, and individually assigned to workers. Respiratory protection shall be a half-face piece respirator with high efficiency (P100) filters. Respirators must be kept in position from the time the worker attaches bag to pipe until final cleaning of the pipe and bagging of waste is completed. Filters shall be changed after 24 hours of wear or sooner if breathing resistance increases. No person using respirator shall wear facial hair which affects the seal between respirator and face.

1.5 Protective Clothing

Workers shall wear disposable Tyvek coveralls (or equivalent) with attached elasticized hood. Coveralls and hood shall remain in place until worker completes cleaning of pipe. Disposable coveralls must be disposed of as asbestos waste at the end of each shift or at each break.



1.6 Other Equipment

Labelled asbestos waste bags (6 mil) - for all asbestos waste in glove bag, disposable suit, cleaning materials, etc.

Asbestos warning signs.

Wire saw - saw with flexible serrated wire blade and handles to allow use inside glove bag.

Knife with fully retractable blade or carpet (hook) knife for use inside glove bag.

Securing Straps - Reusable nylon straps at least 1" wide with metal buckle for sealing ends of Moveable Glove Bag around pipe and/or insulation.

Water Sprayer -Garden reservoir type, low velocity, capable of producing mist or fine spray with water containing wetting agent. Wetting agent shall be diluted 2 oz. per gallon of water.

Plastic sheet (2 mil polyethylene) to cover exposed or damaged sections of pipe prior to attaching glove bag.

Plastic drop sheet (6 mil polyethylene) to protect furnishings, flooring or equipment in the event of a spill.

Sealer or encapsulant suitable for service temperature of pipe applied by brush, cloth or hand sprayer.

Miscellaneous tools and cleaning supplies, wire cutters, snips, scouring pads, sponges, brushes, buckets, tape etc.

2.0 OTHER PROTECTIVE MEASURES

Do not eat, drink or smoke in the work area.

On completing cleanup of work area, use HEPA vacuum or wet cloth to clean hands, face, respirator and boots. Remove protective equipment and proceed to nearest washroom to wash all exposed skin on hands and face.

3.0 SCHEDULING OF WORK

Schedule work when occupants are absent. If persons are present, do not start work.

If work is required on an emergency basis and the area is occupied, the Hazardous Materials Specialist or Project Designate is to advise occupants to vacate area until work is complete and clearance is given to return.

4.0 PREPARATION

Where practical, clear area below pipe of moveable furnishing or equipment. Provide scaffold as required to reach pipe.



Install plastic drop sheet over furnishings, flooring or equipment for protection in the event of a spill. Drop sheet shall be sufficient size to capture any material dislodged from the pipe.

Post an asbestos warning sign at all entrances to room in which the procedure is being used. If necessary use rope or tape barriers to separate work area.

Disable ventilation system in area of Glove Bag operation. Seal voids and openings in the proximity of the Glove Bag operation, including ventilation ducts.

Don protective clothing and respirator prior to disturbing any asbestos-containing material by any work.

Pre-clean with HEPA vacuum or wet methods any loose material on surface of pipe or any material on the floor. If asbestos-containing material is on floor, Type 2 procedures may be required for clean-up. (See Type 2 Procedures.)

Check condition of pipe insulation where removal will be performed. If the insulation has minor damage, mist surface and patch with tape. If damage is more extensive, wrap pipe with 2 mil plastic and "candy stripe" with duct tape first. If pipe insulation is severely damaged and cannot be simply repaired, glove bag is not appropriate. (Use Type 2 or Type 3 Procedures.)

5.0 EXECUTION

- Follow manufacturer's instructions for Glove Bag being used.
- Place tools necessary to remove insulation in tool pouch. Fasten bag onto pipe and seal all openings to pipe with cloth securing straps or tape.
- Place hands into gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag. Do not use glove bag method on insulation jacketing made of aluminium of thickness greater than 0.51 mm (24 gauge) or steel.
- Insert nozzle of spray pump into bag through valve and wash down pipe and interior of bag thoroughly. Use one hand to aid washing process. Wet surface of insulation in lower section of bag and exposed end of asbestos insulation remaining on pipe by spraying with water prior to moving bag.
- If Glove Bag is to be moved along pipe, adjust strap tension, move bag and re-seal to pipe using double-pull zipper to pass hangers. Repeat stripping operation.
- If Glove Bag is removed from pipe for use on new section of pipe, extract the air from the Glove Bag with a HEPA vacuum and seal interior zip lock. Re-install in new location before opening zip lock.



- If Glove Bag is ripped, cut or opened in any way, cease work and repair with tape before continuing work. If damage is not readily repaired, discontinue use of Glove Bag, thoroughly wet contents, extract the air from the Glove Bag with a HEPA Vacuum and place Glove Bag in an asbestos waste container.
- To remove bag once filled, wash top section and tools thoroughly. Place tools in 1 hand (glove), pull hand out inverted, twist to create separate pouch, double tape to seal. Cut between tape and place pouch with tools in next glove bag; or into water bucket, open pouch underwater, clean tools and allow to dry.

Extract air from the Glove Bag with a HEPA vacuum and pull asbestos waste container over Glove Bag before removing the pipe. Remove securing straps or tape. Remove Bag from pipe directly into asbestos waste container.

- After removal of bag ensure pipe is clean of residue and clean surfaces of pipe or wipe with wet cloth.

Before completion of shift, apply sealer to all surfaces of freshly-exposed pipe. Apply heavy coat of sealer or end cap to exposed ends of asbestos insulation to remain.

Once Glove Bag is filled dispose of as contaminated waste. Do not reuse bag.

Clean work area with HEPA vacuum or by damp wiping.

6.0 WASTE TRANSPORT AND DISPOSAL

All asbestos transportation and disposal must meet the requirements of Ontario Environmental Protection Act (O. Reg. 347) and the Ontario Occupational Health and Safety Act (O. Reg and its regulations). As all asbestos waste shall be stored in rigid, impermeable, sealed containers of sufficient strength to accommodate the weight and nature of the waste. Containers shall be labelled and assigned exclusively for asbestos waste and the exterior surface of the asbestos waste containers must be kept free of asbestos waste.

Asbestos waste removed from site shall be removed by a qualified contractor trained in the disposal of asbestos wastes. When waste is removed from site, collect the completed waste waybills from the disposal firm. For work performed by a contractor, the contractor will be responsible for preparing all waste transfer documentation and for providing copies of all documents to HHS. Waste generated by HHS staff will be stored in a secure location until sufficient waste accumulates for a pick-up.



7.0 NOTICE OF PROJECT

If a contractor or Maintenance staff will use glove bags for major amounts of removal (more than one square meter of pipe insulation measured on the outside diameter of the insulation), they must submit a written Notice of Project to the Ministry of Labour as required by Regulation 278/05.

APPENDIX E
Ceiling Tile Procedures



1.0 PURPOSE FOR THIS PROCEDURE

The purpose of this Procedure is to describe methods for regulatory classification of ceiling tile work at MUMC, and to set out work methods and measures that must be followed in order to comply with O. Reg. 278/05.

The original building construction included the use of sprayed-on-fireproofing containing 5-10% chrysotile asbestos. Although the asbestos-containing materials are physically separated from the ceiling plenum, the fire barrier separating the interstitial spaces from the false ceiling has been penetrated during historical construction and maintenance activities. As such, the possibility that debris containing asbestos may have accumulated on the top surface of ceiling tiles cannot be eliminated. In situations where it can be reasonably anticipated that there has been a breach in this barrier and fallen asbestos-containing debris is likely to be lying on top of ceiling tiles, O. Reg. 278/05 requires ceiling tile displacement and removal to be classified as a Type 2 asbestos work operation.

Also, in several areas of the building, ceiling tiles contain amosite or chrysotile asbestos as an ingredient. The displacement or removal of these tiles is classified as a Type 1 or 2 Asbestos Work Operation, which is dependent on the area of tile removed, and the manner in which they are removed. If these ceiling tiles are in a state such that they can be readily broken or crumbled, or their displacement or removal presents the potential for dispersal of airborne dusts containing amosite or chrysotile, then the displacement or removal of these ceiling tiles will be classified as a Type 2 Asbestos Work Operation under O. Reg. 278/05.

2.0 APPLICATION AND CLASSIFICATION OF WORK:

These procedures apply whenever work involves the removal or displacement of ceiling tiles that are part of a false ceiling. This includes lifting, relocating, removing and/or replacing ceiling tiles located in the T-bar tracking at ceiling level in the occupied spaces throughout the Building.

These procedures apply to the handling of all ceiling tiles (both ACM¹ and non-ACM tiles).

These procedures do not apply to the removal of a light shield or a fluorescent lamp, nor to the removal of a ballast or ballast cover.

These procedures do not apply to ceiling tiles located in the following areas:

- 1M Shipping and Receiving Offices (1T), Garbage Dock (1T), Stores (1T, 1E) and Pharmacy (1E). This sprayed-on insulation containing asbestos has been removed and has been

¹ The asbestos inventory located within the McMaster University Health Sciences Building Asbestos Management Plan specifies ceiling tiles in various locations that contain a small percentage of amosite asbestos fibres.



replaced with a non-asbestos type insulation. Ceiling tiles in these areas are also non-asbestos. If there is any doubt check with current Asbestos Audit and/or the Hazardous Materials Specialist.

Based on the conditions within the false ceiling space, the removal of false ceilings or part thereof in MUMC will be classified as follows:

Ceiling tiles that do not contain asbestos as an ingredient within the tile:

- In areas with no visible asbestos material present on the surface of the ceiling tiles, the work shall be performed as normal work;
- In areas with visible asbestos material present on the surface of the ceiling tiles, the work shall be performed as Type 2 asbestos work.

Ceiling tiles containing asbestos as an ingredient within the tile:

- Where the tile is in good condition and can be moved without being cut or damaged, and the area of removal is less than 7.5 square meters, the work shall be performed as a Type 1, unless asbestos material is present on the surface.
- Where the tiles can be readily broken or crumbled, or the area of removal is greater than 7.5 square meters, the work shall be performed as Type 2 asbestos work.
- In areas with visible asbestos material present on the surface of the ceiling tiles, the work shall be performed as Type 2 asbestos work.

3.0 PERFORMANCE OF WORK

3.1 Inspection

Handling of ceiling tiles in MUMC shall be performed in accordance with the procedures outlined below.

Prior to the start of any ceiling tile removal or movement, an inspection shall be conducted above the ceiling tiles in order to classify work.

- One ceiling tile shall be raised and a visual inspection conducted for (i), breaches directly above the intended ceiling tile work area and (ii), friable material laying on the surface of the false ceiling.
- Based on findings, the work shall be classified as per section 2.
- When a ceiling tile has been slid into friable material laying on the surface of the false ceiling and a Type 2 cleaning cannot be immediately carried out, the tile shall be left in place and the opening sealed with polyethylene sheeting and duct tape.



Should personnel performing an inspection want to wear a respirator during inspection, they should be provided with and wear a NIOSH approved, half-face, negative pressure air purifying respirator, equipped with a HEPA/P100 filter.

3.2 Type 1

Prior to handling ceiling tiles, if any dust is present on the floor and surfaces below the ceiling tile work, the area shall be surface cleaned using a HEPA vacuum.

Polyethylene drop sheeting shall be placed on the floor and surfaces immediately below the ceiling tiles to be handled to control the spread of asbestos dust.

Frequently, throughout the duration and upon completion of the work, the area shall be cleaned of dust or waste containing asbestos either by using a HEPA vacuum or by damp mopping or wet sweeping.

Polyethylene sheeting shall be disposed of by wetting and inwardly folding the sheeting and disposing of the material as ACM waste in accordance with section 6 of this procedure.

All waste generated during this ceiling tile work will be disposed of as ACM waste in accordance with section 6 of this procedure.

Upon leaving the work area, the worker shall wash their hands and face using washroom facilities nearby.

3.3 Type 2

Before commencing work, personal protective equipment as outlined in section 4 will be donned by all workers remaining within the Type 2 work area.

If the work area is enclosed by walls, the room becomes the Type 2 enclosure and following shall be done:

- Before commencing work, a clearly visible sign warning of asbestos dust hazard and restricting entry to those persons wearing personal protective equipment shall be posted on all entrances into the room.
- The supply and exhaust vents to and from the work area shall be sealed using polyethylene sheeting and duct tape.

If the area in which the ceiling tiles to be handled is not enclosed by walls, the spread of asbestos dust from the work area shall be controlled by an enclosure (with viewing window) constructed using polyethylene sheeting or other suitable material and following shall be done:

- Before commencing work, a clearly visible sign warning of asbestos dust hazard and restricting entry to those persons not wearing personal protective equipment shall be posted on the exterior of the enclosure.



- If any supply and exhaust vents are located within the work area, they shall be sealed using polyethylene sheeting and duct tape.

Prior to handling ceiling tiles, if any dust is present on the floor and surfaces below the ceiling tile work, the area shall be surface cleaned using a HEPA vacuum.

Polyethylene shall be placed on the floor and surfaces immediately below the ceiling tiles to be handled to control the spread of asbestos dust.

Ceiling tiles are to be handled as follows:

- Following the movement of the first ceiling tile, the unfinished surface of the ceiling tile shall be vacuumed using a vacuum equipped with a HEPA filter. This will minimize the potential for disturbance of friable material throughout the enclosed area.
- Through the opening into the false ceiling, HEPA vacuum the tops of all accessible ceiling tiles. Ensure that the entire unfinished surface of the ceiling tile is vacuumed, regardless of whether visible dust or debris is present.
- Remove tiles that have been vacuumed and stack inside the work area. Cover the cleaned tiles with polyethylene sheeting until contaminated work is complete.
- Repeat until all required ceiling tiles have been removed.

Frequently, throughout the duration and upon completion of the work, the area shall be cleaned of dust or waste containing asbestos either by using a HEPA vacuum or by damp mopping or wet sweeping.

All waste generated during this ceiling tile work will be disposed of as ACM waste in accordance with section 6 of this procedure.

A final decontamination of the work area is to be carried out as follows:

- HEPA vacuum or damp wipe all surfaces within the work enclosure. Starting at the ceiling level, and include all surfaces (ceiling grid, piping, walls, floors, etc.)
- Polyethylene sheeting shall be disposed of by wetting and inwardly folding the sheeting and disposing of the material as ACM waste in accordance with section 6 of this procedure.
- All equipment, material, tools and waste containers must be HEPA vacuumed or damp wiped prior to removal from the enclosed area.

4.0 PERSONAL PROTECTIVE EQUIPMENT

Workers performing Type 2 work will wear protective clothing as prescribed by O. Reg. 278/05.



- Clothing shall be made of material that does not readily retain nor permit the penetration of asbestos fibres;
- Shall consist of head coverings and full body coverings that fit snugly at the ankles, wrists, and neck;
- Shall be replaced if torn.

Workers performing Type 2 work will wear a minimum NIOSH approved, full-face, negative air-purifying respirator equipped with HEPA/P100 filters when removing false ceiling tiles where ACM is likely to be lying on surfaces of the false ceiling. Workers issued respirators will be fit-tested and shall perform a fit-check each time they don their respirator.

Safety boots rising above the ankle are required.

5.0 DECONTAMINATION PROCEDURES

Decontamination shall occur in the following sequence:

- Before exiting the Type 2 area or enclosure, a worker shall decontaminate his or her protective suit and footwear by damp wiping or by vacuuming with a HEPA vacuum.
- The worker shall then enter the clean area and then roll off their protective suit and place it within a plastic bag, seal the bag and do either of the following:
 - Transport the protective suit for re-use in another abatement area; or
 - Dispose of the protective suit as asbestos waste in accordance with section 6 described below.
- The worker will damp wipe their respirator face piece and cartridges and then remove their respirator.
- The worker will further damp wipe their respirator face piece, place duct tape over the exterior of the HEPA/P100 cartridges on their respirator and place it within its respirator storage container.
- Upon leaving the Type 2 area, the worker shall wash their hands and face using washroom facilities nearby.
- Using washroom facilities, workers can further rinse their respirator face piece, dry and replace within storage container.

6.0 DISPOSAL OF ASBESTOS WASTES

All asbestos contaminated waste shall be placed into yellow 6 mil polyethylene bags labelled as containing asbestos waste and sealed for airtight closure using duct tape. This bag should then be



placed inside a clear 6 mil polyethylene bag which is independently sealed airtight using duct tape. Asbestos contaminated waste with sharp edges should be taped in a manner as to prevent ripping of the polyethylene bag.

Polyethylene waste bags must be HEPA vacuumed or damp wiped before being removed from the work area.

If ACM wastes are significant (i.e. more than 1lb) wastes shall be transported directly to an asbestos waste bin. If ACM wastes are in small quantities (i.e. less than 1lb), wastes shall be transported for temporary storage to shaft 33 (unless otherwise instructed by project designate). All ACM wastes shall be placed in yellow 6 mil polyethylene bags labelled 'asbestos waste'. Waste shall be transported in covered bins to either of these two locations, and be removed from work areas at regular intervals.

Within shaft 33, all waste materials shall be placed within the rigid bins that are lined with yellow 6 mil polyethylene bags labelled as asbestos waste.

Workers performing waste handling within the Type 2 area shall wear the personal protective equipment specified in section 4.

All wastewater used within the Type 2 area shall be filtered or disposed of as asbestos waste. Filters and residues are to be disposed of as asbestos waste.

7.0 PROHIBITIONS

Workers shall not eat, drink or chew while any asbestos-related work is being performed. No smoking is allowed within the Health Sciences Building.

Compressed air shall not be used for cleaning or dust removal.

8.0 RE-USE OR DISPOSAL OF CEILING TILES

All removed, non-asbestos containing ceiling tiles that are chipped or broken are to be HEPA vacuumed, the unfinished surface locked down, and the tile disposed of as normal waste.

Non-asbestos ceiling tiles that are in good condition can be re-used if they have been HEPA vacuumed and the unfinished surface locked down.

All removed asbestos containing ceiling tiles are to be disposed of as asbestos waste.

9.0 RECORD KEEPING

As ceiling spaces above non-asbestos ceiling tile areas are cleaned, the Hazardous Materials Specialist shall be notified and shall update the asbestos records indicating the same. Subsequent work in these areas could be done as non-asbestos ceiling tile work.

APPENDIX F
Encased Quadrant Project Procedures



Changes to the asbestos management plan in response to the encasement of friable, sprayed-on, ACM fireproofing within the interstitial space quadrants are listed below.

- Any work that is likely to disturb asbestos shall be reviewed and classified per O. Reg. 278/05 by an HHS supervisor/project designate, the Hazardous Materials Specialist and/or consultant on the behalf of HHS.
- It should be noted that there are areas with friable ACM within the interstitial/mechanical spaces and shafts where the encasement system has not been applied, and areas where there is the possibility of friable ACM on surfaces due to accessibility issues. Un-encapsulated fireproofing is present on the underside of the trusses throughout the interstitial spaces. Review the Summary of Asbestos Locations for further details.
- Within the interstitial spaces, small ceiling tabs (approximately 2.5 cm or 1") are used for hanging stringers. These tabs are located on the Q-deck ceiling and may be covered with over-spray of the original fireproofing. Should work require hanging a stringer from these tabs, then please refer to Appendix G-Procedure for Use of Encased Ceiling (Deck) Tabs for additional details.
- Any passage into, and/or work performed in "dirty" shafts must be done using Type 2 asbestos work procedures. Likewise, before entering a quadrant or room from an adjacent "dirty" shaft, workers must decontaminate themselves and any tools, equipment, etc. per O. Reg. 278/05. The use of "dirty" shafts to access the interstitial space should be avoided at all costs. If they require use then planning with the Hazardous Materials Specialist is required to set-up a decontamination room outside the shaft. Prior to entering the quadrant the worker is required to remove all of their protective gear and place it in an appropriate container for safe storage and/or disposal.
- Generally, openings between the Q-deck ceiling and the high beams have been encased. However, should work require conduit or cable to be run through these areas, this work shall be performed as outlined in Appendix K.
- Installing conduit between the double drywall ceiling and structure is to be performed as outlined in Appendix K.
- Removing, penetrating, or otherwise damaging the encasement system shall be considered to be asbestos-related work and classified as either Type 2 (less than one square metre) or Type 3 (more than one square metre) asbestos work based on O. Reg. 278/05.
- Work on any surfaces where the presence of a suspected ACM is found must stop and the material in question be brought to the attention of Engineering or Capital



**Asbestos Management Program (MUMC)
Part B - Procedures**

Hamilton Health Sciences
Encased Quadrant Project Procedures

Pinchin File: 217420.028

Appendix F

Development for review, inspection and/or bulk asbestos analysis or the materials can be treated as asbestos-containing and asbestos procedures followed.

- Any pre-existing disturbed friable ACM and/or breeches to the encasement discovered during the pre-construction inspection must be noted and reported immediately to the Project Designate for clean-up. Any breeches occurring subsequent to the start of work must be immediately cleaned up and/or repaired by the party causing the disturbance provided they have the proper training which would include Green Card Training. All repairs to encasement will be completed as outlined in the Encasement Repair Procedure (Appendix H).
- Any pre-existing penetrations in the double layer drywall discovered during the pre-construction inspection must be noted and reported immediately to the Project Designate for repair. Any penetrations occurring subsequent to the start of work must be immediately filled with fire rated caulking or drywall mud.
- The Contractor will be responsible to perform pre and post project damage assessments as required by HHS. Refer to the HHS Guidelines for Management of interstitial Space Hazards present in Appendix L for project damaged assessments.
- Removal of the corrugated metal decking and all work conducted below the decking is to be completed following Type 2 procedures as outlined in Appendix C.

APPENDIX G
Procedure for Use of Encased Deck Tabs

PART 1 GENERAL

1.1 General

- .1 The following Type 2 varied procedure is to be followed when altering encased deck tabs on structural steel decking to be used as installation points for hangers in the interstitial spaces at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 The work is classified as a Type 2 operation under Section 12(3)2 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05. Testing included; personal, area, occupied and reference air sampling. The sampling was conducted during work that consisted of continuously repairing breaches to the encasement and cleaning-up debris from asbestos-containing sprayed fireproofing on horizontal surfaces below breaches within the test location.
- .3 The varied procedures include: specific worker training in the varied procedures and varied site isolation procedures.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this procedure.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist or Facilities Management, by appointment.

1.3 Varied Section of O.Reg. 278/05

- .1 The following Section of O.Reg. 278/05 is being varied as allowed under Section 23 of the Regulation:
 - .1 Section 16.5.i - Requirement for an enclosure of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls. Section 16(5)i is being varied to only include caution tape surrounding the work area at a distance of 15 feet and posting asbestos warning signs. The site isolation is being varied due to the difficulty of constructing an enclosure for this work in certain areas of the hospital without damaging the existing asbestos-containing sprayed

fireproofing and further risking occupant and worker exposure to asbestos present in the work area.

- .2 Section 16.5.ii - Requirement for disabling the mechanical ventilation system serving the work area. Section 16.5.ii is being varied to only include sealing supply air diffusers and return air grilles, where present, with polyethylene sheeting.

1.4 Instruction and Training

- .1 Provide instruction and training to all workers, which should include the following:
 - .1 Hazards of asbestos.
 - .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that may be used and worn during work outlined in this varied procedure, including:
 - .1 Limitations of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Proper fitting of equipment.
 - .4 Disinfecting and cleaning of equipment.
 - .3 Personal hygiene to be observed when performing the work.
 - .4 The measures and procedures prescribed by this section.
 - .5 Instruction and training must be provided by a competent person.

1.5 Personal Hygiene

- .1 Provide the following respiratory protection to all workers:
 - .1 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Disposable protective clothing.
- .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.

- .8 Provided with new filters as necessary, according to manufacturer's instructions.
- .9 Worn by personnel who have been fit tested by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Provide protective clothing which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable safety regulations and HHS policies.
- .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.
- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 Procedures as required by O. Reg. 278/05.
- .2 As required, install temporary lighting in the work area that is consistent with the Occupational Health and Safety Act of Ontario.
- .3 Provide safe access to the work area by installing scaffold planks and plywood as necessary.
- .4 Install caution tape barrier to restrict access to only personnel performing the work; caution tape is to be at least 15 feet from all points of work. Install Signage in clearly visible locations, at all entrance points to the work area under contamination and in sufficient numbers to adequately warn of an asbestos dust hazard.
- .5 Cover floors adjacent to and beneath deck tabs to be altered with polyethylene drop sheets before commencing with alteration work. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers; support polyethylene drop sheets in place.
- .6 Establish and install a designated worker and waste decontamination area within the Work Area.
 - .1 Equip decontamination worker decontamination area with soap, water and towels.
- .7 Place required equipment and materials in the Work Area.
- .8 HVAC system servicing the Work Area may remain operational. Where present, supply air diffusers and return air grilles are to be sealed with polyethylene sheeting.

- .9 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .10 Do not use compressed air to clean or remove dust or debris.

2.2 Deck Tab Alteration

- .1 Wet all areas of the deck tab to be altered with amended water in order to control the spread of dust.
- .2 While using an operating HEPA vacuum with the nozzle being held close to the deck tab, complete the following:
 - .1 Pry the deck tab open using only non-powered hand-held tools.
 - .2 Once the deck tab is open, insert the hanger into the deck tab.
- .3 Upon completion of alteration work, any encased asbestos-containing sprayed fireproofing that has been damaged is to be repaired following the applicable varied encasement repair procedure in the HHS AMP.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene drop sheets, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene drop sheets are not to be reused and are to be rolled-up, placed into asbestos waste containers.
- .3 Remove caution tape barrier, signage, temporary lighting (i.e. where used), working platforms, etc.

2.4 Worker Clean-up

- .1 Before leaving the Work Area at the end of the work period all workers shall:
 - .1 Decontaminate protective clothing and respirator by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing personal protective equipment. If the protective clothing will not be reused, place it in an asbestos waste container.
 - .2 Clean footwear by wet wiping.
- .2 Proceed to designated washroom or sink and wash hands and face.
 - .1 Maintain respirator and replace filters as necessary.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .2 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.

- .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
- .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .3 **HEPA Vacuum:** High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .4 **Polyethylene Sheeting:** 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .5 **Protective Clothing:** Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .6 **Rip-Proof Polyethylene Sheeting:** Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .7 **Sprayer:** Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .8 **Tape:** Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 **Work Area Signs:** Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
 - .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
- .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
- .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
- .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

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APPENDIX H
Encasement Repair Procedures

PART 1 GENERAL

1.1 General

- .1 The following Type 2 varied procedure is to be followed when repairing one square metre or less of damaged encasement that is present over asbestos-containing sprayed fireproofing at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 The work is classified as a Type 2 operation under Section 12(3)2 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05. Testing included; personal, area, occupied and reference air sampling. The sampling was conducted during work that consisted of continuously repairing breaches to the encasement and cleaning-up debris from asbestos-containing sprayed fireproofing on horizontal surfaces below breaches within the test location.
- .3 The varied procedures include: specific worker training in the varied procedures and varied site isolation procedures.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this procedure.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist or Facilities Management, by appointment.

1.3 Varied Section of O.Reg. 278/05

- .1 The following Section of O.Reg. 278/05 is being varied as allowed under Section 23 of the Regulation:
 - .1 Section 16.5.i - Requirement for an enclosure of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls. Section 16.5.i is being varied to only include caution tape surrounding the work area at a distance of 15 feet, posting asbestos warning signs and installation of polyethylene drop sheets. The site isolation is being varied due to the difficulty of constructing an enclosure for this work in certain areas of the hospital without

damaging the existing asbestos-containing sprayed fireproofing and further risking occupant and worker exposure to asbestos present in the work area.

- .2 Section 16.5.ii - Requirement for disabling the mechanical ventilation system serving the work area. Section 16.5.ii is being varied to only include sealing supply air diffusers and return air grilles, where present, with polyethylene sheeting.

1.4 Instruction and Training

- .1 Provide instruction and training to all workers, which should include the following:
 - .1 Hazards of asbestos.
 - .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that may be used and worn during work outlined in this varied procedure, including:
 - .1 Limitations of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Proper fitting of equipment.
 - .4 Disinfecting and cleaning of equipment.
 - .3 Personal hygiene to be observed when performing the work.
 - .4 The measures and procedures prescribed by this section.
 - .5 Instruction and training must be provided by a competent person.

1.5 Personal Hygiene

- .1 Provide the following respiratory protection to all workers:
 - .1 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Disposable protective clothing.
- .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.

- .9 Worn by personnel who have been fit tested by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Provide protective clothing which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable safety regulations and HHS policies.
- .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.
- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 Procedures as required by O. Reg. 278/05.
- .2 As required, install temporary lighting in the work area that is consistent with the Occupational Health and Safety Act of Ontario.
- .3 Provide safe access to the work area by installing scaffold planks and plywood as necessary.
- .4 In order to accommodate various work area site conditions, site protection is to be erected using either of the following options:
 - .1 Option #1 - in open work areas, install caution tape barrier to restrict access to only personnel performing the work; caution tape is to be at least 15 feet from all points of work. Install Signage in clearly visible locations, at all entrance points to the work area under contamination and in sufficient numbers to adequately warn of an asbestos dust hazard.
 - .2 Option #2 - in work areas isolated to a room, set-up the entire room as Type 2 enclosure. Install signage at each door to the work area and ensure all occupants have been notified of the room being closed and to adequately warn of an asbestos dust hazard.
- .5 Cover floors adjacent to and beneath areas of the encasement to be repaired with polyethylene drop sheets before commencing with repair work. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers; support polyethylene drop sheets in place.
- .6 Establish and install a designated worker and waste decontamination area within the Work Area.

- .1 Equip decontamination worker decontamination area with soap, water and towels.
- .7 Place required equipment and materials in the Work Area.
- .8 HVAC system servicing the Work Area may remain operational. Where present, supply air diffusers and return air grilles are to be sealed with polyethylene sheeting.
- .9 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .10 Do not use compressed air to clean or remove dust or debris.

2.2 Encasement Repair

- .1 Identify breaches using caution tape, surveyors tape, etc.
- .2 Repair breaches by applying an encasement material that is acceptable to HHS using a hand-held paint brush.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene drop sheets, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene drop sheets are not to be reused and are to be rolled-up, placed into asbestos waste containers.
- .3 Remove caution tape barrier, signage, temporary lighting (i.e. where used), working platforms, etc.

2.4 Worker Clean-up

- .1 Before leaving the Work Area at the end of the work period all workers shall:
 - .1 Decontaminate protective clothing and respirator by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing personal protective equipment. If the protective clothing will not be reused, place it in an asbestos waste container.
 - .2 Clean footwear by wet wiping.
- .2 Proceed to designated washroom or sink and wash hands and face.
 - .1 Maintain respirator and replace filters as necessary.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.

- .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .2 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .3 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .4 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .5 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .6 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
 - .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:

- .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
- .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
- .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

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PART 1 GENERAL

1.1 General

- .1 The following Type 3 varied procedure is to be followed when repairing more than one square metre of damaged encasement that is present over asbestos-containing sprayed fireproofing at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 The work is classified as a Type 3 operation under Section 12(4)1 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05. Testing included; personal, area, occupied and reference air sampling. The sampling was conducted during work that consisted of continuously repairing breaches to the encasement and cleaning-up debris from asbestos-containing sprayed fireproofing on horizontal surfaces below breaches within the test location.
- .3 The varied procedures include: specific worker training in the varied procedures, varied personal protection equipment, varied worker decontamination procedures, varied site isolation procedures and varied air monitoring requirements.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this procedure.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.
- .7 Air monitoring during this varied procedure is to be conducted in accordance with the air monitoring requirements outlined in the HHS AMP.
- .8 Before commencing with this varied procedure notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist or Facilities Management, by appointment.

1.3 Varied Sections of O.Reg. 278/05

- .1 The following Sections of O.Reg. 278/05 are being varied as allowed under Section 23 of the Regulation:
 - .1 Section 18(4) 2 and 3 - Requirement for a polyethylene enclosure and decontamination facility with three separate rooms, constructed in sequence, and a shower for workers leaving the work area. Section 2 is being varied to only include caution tape surrounding the work area at a distance of 15 feet, posting

asbestos warning signs and installation of polyethylene drop sheets. The site isolation is being varied due to the difficulty of constructing an enclosure for this work in certain areas of the hospital without damaging the existing asbestos-containing sprayed fireproofing and further risking occupant and worker exposure to asbestos present in the work area. Section 2 and 3 shower requirements are being varied to only include a designated decontamination facility with no shower due to the low concentrations of asbestos present in airborne and surface dust during the work, and the difficulty of safely constructing and draining a shower in certain areas of the hospital.

- .2 Section 18(4) 4 – Requirement for disabling the mechanical ventilation system serving the work area. Section 18(4) 4 is being varied to only include sealing supply air diffusers and return air grilles, where present, with polyethylene sheeting.
- .3 Section 18(4) 5 and 6 - Requirement for a HEPA filtered exhaust ventilation system maintained by a competent worker, taking replacement air from outside the work area, and monitoring the negative pressure differential. Sections 5 and 6 will be varied to only include HEPA filtered vacuums which will be in use at all times in the immediate vicinity of the work. The negative pressure precaution is not considered necessary due to the low concentrations of asbestos present in airborne and surface dust during the work. Also, as indicated in the above variance, without an enclosure negative pressure within the work area is not feasible.
- .4 Section 18(4) 7 – Provides detailed requirements for the shower. Not required as per the reasons in item 1.3.1.1 above.
- .5 Section 18(4) 8 – Provides detailed requirements for worker decontamination. This will be modified to provide a designated worker decontamination area for removal of Personal Protective Equipment (PPE) and washing area.
- .6 Section 18(4) 15.1 – Negative air maintained during completion of the work. Not required as per Section 1.3.1.2.
- .7 Section 18(4) 16 - Air clearance sampling will be conducted as per the HHS AMP.

1.4 Instruction and Training

- .1 Provide instruction and training to all workers, which should include the following:
 - .1 Hazards of asbestos.
 - .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that may be used and worn during work outlined in this varied procedure, including:
 - .1 Limitations of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Proper fitting of equipment.
 - .4 Disinfecting and cleaning of equipment.
 - .3 Personal hygiene to be observed when performing the work.

- .4 The measures and procedures prescribed by this section.
- .5 Instruction and training must be provided by a competent person.

1.5 Personal Hygiene

- .1 Provide the following respiratory protection to all workers:
 - .1 Non-powered full-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Disposable protective clothing.
- .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit tested by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Provide protective clothing which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable safety regulations and HHS policies.
- .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.
- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 Procedures as required by O. Reg. 278/05.
- .2 As required, install temporary lighting in the work area that is consistent with the Occupational Health and Safety Act of Ontario.
- .3 Provide safe access to the work area by installing scaffold planks and plywood as necessary.
- .4 In order to accommodate various work area site conditions, site protection is to be erected using either of the following options:
 - .1 Option #1 - in open work areas, install caution tape barrier to restrict access to only personnel performing the work; caution tape is to be at least 15 feet from all points of work. Install Signage in clearly visible locations, at all entrance points to the work area under contamination and in sufficient numbers to adequately warn of an asbestos dust hazard.
 - .2 Option #2 - in work areas isolated to a room, set-up the entire room as an enclosure. Install signage at each door to the work area and ensure all occupants have been notified of the room being closed and to adequately warn of an asbestos dust hazard.
- .5 Cover floors adjacent to and beneath areas of the encasement to be repaired with polyethylene drop sheets before commencing with repair work. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers; support polyethylene drop sheets in place.
- .6 Establish and install a designated worker and waste decontamination area within the Work Area.
 - .1 Equip decontamination worker decontamination area with soap, water and towels.
- .7 Place required equipment and materials in the Work Area.
- .8 HVAC system servicing the Work Area may remain operational. Where present, supply air diffusers and return air grilles are to be sealed with polyethylene sheeting.
- .9 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .10 Do not use compressed air to clean or remove dust or debris.

2.2 Encasement Repair

- .1 Identify breaches using caution tape, surveyors tape, etc.
- .2 Repair breaches by applying an encasement material that is acceptable to HHS using a hand-held paint brush.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene drop sheets, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene drop sheets are not to be reused and are to be rolled-up, placed into asbestos waste containers.
- .3 Remove caution tape barrier, signage, temporary lighting (i.e. where used), working platforms, etc.

2.4 Worker Clean-up

- .1 Before leaving the Work Area at the end of the work period all workers shall:
 - .1 Decontaminate protective clothing and respirator by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing personal protective equipment. If the protective clothing will not be reused, place it in an asbestos waste container.
 - .2 Clean footwear by wet wiping.
- .2 Proceed to designated washroom or sink and wash hands and face.
 - .1 Maintain respirator and replace filters as necessary.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
 - .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .2 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .3 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .4 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .5 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or

approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.

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

3.2 Signage

- .1 **Work Area Signs:** Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
 - .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
 - .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
 - .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
 - .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

APPENDIX I

Ductwork Removal Type 3 Varied Work Procedure

PART 1 GENERAL

1.1 General

- .1 The following Type 3 varied procedure is to be followed when removing rigid ductwork, connectors, diffusers, return air grilles, flex duct, components, etc. at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 The work is classified as a Type 3 operation under Section 12(4) 3 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05.
- .3 The varied procedures include: specific worker training in the varied procedures, varied personal protection equipment, varied worker decontamination procedures, varied site isolation procedures and varied air monitoring requirements.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.
- .7 Air monitoring during this varied procedure is to be conducted in accordance with the air monitoring requirements outlined in the HHS AMP.
- .8 Before commencing with this varied procedure notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, by appointment.

1.3 Varied Sections of O.Reg. 278/05

- .1 The following Sections of O.Reg. 278/05 are being varied as allowed under Section 23 of the Regulation:
 - .1 Section 18(4) 2 and 3 - Requirement for a polyethylene enclosure and decontamination facility with three separate rooms, constructed in sequence, and a shower for workers leaving the work area. Section 2 is being varied to only include caution tape surrounding the work area at a distance of 15 feet and posting asbestos warning signs. This is equivalent as previous studies at MUMC have shown airborne fibre levels to be consistently below the Occupational Exposure Limit (OEL) for asbestos in the immediate vicinity of duct removal, and the difficulty of constructing an enclosure for this work in certain areas of the

hospital without damaging the existing asbestos-containing sprayed fireproofing and further risking occupant and worker exposure to asbestos present in the work area. Section 3 shower requirements are being varied to only include a designated decontamination facility with no shower due to the low concentrations of asbestos present in airborne and surface dust during the work, and the difficulty of safely constructing and draining a shower in certain areas of the hospital.

- .2 Section 18(4) 5 and 6- Requirement for a HEPA filtered exhaust ventilation system maintained by a competent worker, taking replacement air from outside the work area, and monitoring the negative pressure differential. Sections 5 and 6 is being varied to only include HEPA filtered vacuums which will be in use at all times in the immediate vicinity of the work. The negative pressure pre-caution is not considered necessary due to the low concentrations of asbestos present in airborne and surface dust during the work as shown during previous studies at MUMC. As indicated in the above variance, without an enclosure negative pressure within the work area is not feasible.
- .3 Section 18(4) 7 – Provides detailed requirements for the shower. Not required as per the reasons in item 1.3.1.1 above.
- .4 Section 18(4) 8 – Provides detailed requirements for worker decontamination. This will be modified to provide a designated worker decontamination area for removal of Personal Protective Equipment (PPE) and washing area.
- .5 Section 18(4) 15.1 – Negative air maintained during completion of the work. Not required as per item 1.3.1.2 above.
- .6 Section 18(6) 2 – Use of forced air during clearance air monitoring. Not used due to the amount of encapsulated sprayed fireproofing in the vicinity of majority the work areas.
- .7 Section 18(4) 16 - Air clearance sampling will be conducted as per the AMP.
- .8 In addition, for small duct removals (less than 0.6 linear meters), removals for the purpose of cutting and capping for Infection Control, removal of flex ducting for the purpose of repairs and removals of temporary caps, the following Sections of O.Reg. 278/05 will also be varied as allowed under Section 23 of the Regulation:
 - .1 Section 18(4) 16 – Air clearance sampling is being modified to only conduct random air sampling. Studies at MUMC have shown very low to undetectable levels of asbestos fibres within the work areas, worker monitors and outside the work areas during duct removal. The number of samples and minimum volume of air will still adhered to for air clearance sampling when conducted. In addition one worker monitor sample will be collected as well. Air sampling will only occur periodically (bi-annually) to ensure that these varied procedures ensure equal protection to the workers. Air clearance sampling during duct removal for construction projects will occur per project.

1.4 Instruction and Training

- .1 All workers and supervisory personnel performing work outlined in this varied procedure must submit the following prior to commencing with work:

- .1 Proof in the form of a certificate that workers have been certified under the Ministry of Training, Colleges and Universities course 253W.
- .2 Proof in the form of a certificate that supervisory personnel have been certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.
- .2 Provide instruction and training to all workers regarding the measures and procedures prescribed by this section; instruction and training must be provided by a competent person.

1.5 Personal Protection

- .1 Provide the following respiratory protection to all workers:
 - .1 Non-powered full-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
 - .3 Provide protective clothing to all workers, which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
 - .4 Is disposed of as ACM.
 - .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations and HHS policies.
 - .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.

- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 Procedures as required by O. Reg. 278/05.
- .2 Shut down the HVAC system to ensure that portions of the ventilation system to be removed is isolated from the operating building systems.
 - .1 As required, install polyethylene sheeting over openings in ducts and at diffusers and seal.
 - .2 HVAC to remaining areas of building must not be disrupted during work of this section.
 - .3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.
- .3 Upon Shut-down of the HVAC system, isolate the panel and disconnect the existing power supply to the work area. Power supply to remaining areas of the building are not to be disrupted during filter change work.
 - .1 Lock-out/tag-out power as per HHS policy.
- .4 As required, install temporary lighting in the work area that is consistent with the Occupational Health and Safety Act of Ontario.
- .5 Provide safe access to the work area by installing scaffold planks and plywood as necessary.
- .6 In order to accommodate various work area site conditions, site protection is to be erected using either of the following options:
 - .1 Option #1 - in open work areas, install caution tape barrier to restrict access to only personnel performing the work; caution tape is to be at least 15 feet from all points of work. Install Signage in clearly visible locations, at all entrance points to work area under contamination and in sufficient numbers to adequately warn of an asbestos dust hazard.
 - .2 Option #2 - in work areas isolated to a room or where ductwork, connections and components are to be removed from double drywall ceilings, set-up room entire room as Type 2 enclosure. Install signage at each door to the work area and ensure all occupants have been notified of the room being closed and to adequately warn of an asbestos dust hazard.
- .7 Post Ministry of Labour Notice of Project at the designated entrance to the work area.
- .8 Cover floors adjacent to and beneath items to be removed with polyethylene drop sheets before commencing with removal of rigid ductwork, connectors, and components. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers; support polyethylene drop sheets in place.

- .9 Establish and install a designated worker and waste decontamination area within the Work Area.
 - .1 Equip decontamination worker decontamination area with soap, water and towels.
- .10 Place required equipment and materials in the Work Area.
- .11 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .12 Do not use compressed air to clean or remove dust or debris.

2.2 **Removal of Ductwork, Connecters and Components**

- .1 Separate ductwork, connectors and components at connections to minimize vibration whenever possible. Once ductwork sections have been carefully separated from the building system, as required use power shear to cut rigid ductwork, connectors and components into manageable sections. Avoid hammering ductwork or using tools that cause vibration to separate. Use of a reciprocating saw is prohibited. No power tools with the exception of power sheers shall be used to cut or remove ductwork.
 - .1 Immediately clean dust and debris within an arm's reach of openings inside ductwork, connectors and components to remain. Upon cleaning, seal open ends with purpose-made and properly sized sheet metal caps. Secure into place with sheet metal screws. Seal seams with duct caulking.
 - .2 Where ductwork, connections and components were removed through double drywall ceilings, install double drywall in all areas of openings to remain. See HHS Project Designate for details on replacement of drywall and seals.
- .2 Remove sections of ductwork from hangers and place directly onto polyethylene drop sheets. Shear into manageable lengths for disposal using methods that minimize dust creation.
- .3 Tape sharp edges of material prior to waste packaging for disposal.
- .4 Cut hangers to within 1" of encased asbestos-containing fireproofing, unless scheduled to be re-used. Use bolt cutters or shearing methods that do not disturb sprayed fireproofing.
 - .1 In work areas where there is no asbestos-containing sprayed fireproofing hangers may be cut as close to the deck as possible.
- .5 Waste packaging may be completed using either of the following options:
 - .1 Option #1 - Remove all overspray, dust, debris and insulation from rigid ductwork, connectors and components and remove all residual dust from surfaces by wet methods.
 - .1 Cleaned items may be removed from the site as "clean" waste and disposed of as regular waste, except drywall baffles, which cannot be cleaned and are to be double bagged in yellow asbestos labelled bags and disposed of as asbestos waste.
 - .2 Option # 2 - Dispose of rigid ductwork, connectors and components as asbestos waste after wrapping items in either two independently sealed layers of rip-proof

polyethylene sheeting sealed with glue/tape and labelling as asbestos waste or being double bagged in yellow asbestos labelled bags.

- .6 As required in order to remove waste from interstitial space work areas only, create an opening through the lay-in ceiling tile, double drywall and metal decking. A Type 2 enclosure is to be erected in the occupied area below the interstitial space. An upper seal is to be installed between the double drywall ceiling and metal decking to isolate un-encased asbestos-containing sprayed fireproofing on the bottom flanges of the beams in between the systems. As an alternative, this gap may be closed with batt insulation; insulation is to be disposed of as asbestos waste upon completion of work.

- .1 Replace metal decking, double drywall, seals and lay-in ceiling tiles upon removal of waste. See HHS Project Designate for details on replacement of building systems.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene sheeting, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene sheeting used for drops sheets, seals, enclosure construction, etc. is not to be reused and is to be rolled-up and placed into asbestos waste containers.
- .3 Remove caution tape barrier, signage, temporary lighting (i.e. where used), working platforms, etc.

2.4 Worker Clean-up

- .1 Before leaving the Work Area at the end of the work period all workers shall:
 - .1 Decontaminate protective clothing and respirator by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing personal protective equipment. If the protective clothing will not be reused, place it in an asbestos waste container.
 - .2 Clean footwear by wet wiping.
- .2 Proceed to designated washroom or sink and wash hands and face.
- .3 Maintain respirator and replace filters as necessary.

2.5 Re-activation of Equipment

- .1 Upon completion of work, complete the following:
 - .1 Remove locks and tags from electrical panel and re-energize the HVAC system.
 - .2 Conduct a general cleaning of the Work Area using wet mop methods or by using a HEPA vacuum.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.

- .2 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .3 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
 - .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .4 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .5 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .6 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.
- .7 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .8 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .9 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .10 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.

- .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
- .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
- .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
- .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
- .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

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APPENDIX J

AHU Filter Change Type 2 Varied Work Procedure

PART 1 GENERAL

1.1 General

- .1 The following Type 2 varied procedure is to be followed when changing filters in Air Handling Units (AHU) at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 The work is classified as a Type 2 operation under Section 12(3)10 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05.
- .3 The varied procedures include: specific worker training in the varied procedures and varied disposal requirements.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, by appointment.

1.3 Instruction and Training

- .1 Provide instruction and training to all workers, which should include the following:
 - .1 Hazards of asbestos.
 - .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that may be used and worn during work outlined in this varied procedure, including:
 - .1 Limitations of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Proper fitting of equipment.
 - .4 Disinfecting and cleaning of equipment.
 - .3 Personal hygiene to be worn when performing the work.
 - .4 The measures and procedures prescribed by this section.
 - .5 Instruction and training must be provided by a competent person.

1.4 Personal Protection

- .1 Provide the following respiratory protection to all workers:
 - .1 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
- .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Provide protective clothing to all workers, which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
 - .4 Is disposed of as ACM.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations and HHS policies.
- .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.
- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, pre-clean all surfaces outside of the AHU where possible without disturbing asbestos-containing materials using a HEPA vacuum or damp cloth.
- .2 Shut down the AHU to be serviced.

- .3 Upon Shut-down of the AHU, isolate the panel and disconnect the existing power supply to the Work Area. Power supply to remaining areas of the building are not to be disrupted during filter change work.
 - .1 Lock-out/tag-out power as per HHS policy.
- .4 As required, install temporary lighting in the Work Area that is consistent with the Occupational Health and Safety Act of Ontario.
- .5 Install caution tape barrier to restrict access to only personnel performing the work.
- .6 Install signage in clearly visible locations, at all entrance points to the Work Area and in sufficient numbers to adequately warn unprotected workers of an asbestos dust hazard.
- .7 Install curtained doorways at the entry door to the Work Area inside the AHU.
- .8 Establish and install a designated worker and waste decontamination area within the Work Area.
 - .1 Equip decontamination worker decontamination area with soap, water and towels.
- .9 Cover floors adjacent to and beneath filters to be removed inside AHU with polyethylene drop sheets before commencing with filter change work. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers.
- .10 Place required equipment and materials in the Work Area.
- .11 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .12 Do not use compressed air to clean or remove dust or debris.

2.2 AHU Filter Changes

- .1 Wet all AHU pre-filters and filters to be removed with amended water in order to control the spread of dust.
- .2 Remove AHU pre-filters and filters, place directly into boxes formerly containing replacement filters to be installed in the AHU.
- .3 Once the removed filters have been placed into boxes, seal the top flap of the boxes with tape.
- .4 Dispose of removed filters sealed in boxes as clean waste.
- .5 Install new filters prior to reactivating the unit.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene sheeting and drop sheets used, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene drop sheets and door flaps (i.e. where used) are not to be reused and are to be rolled-up and placed into asbestos waste containers.
- .3 Remove caution tape barrier, signage, temporary lighting (i.e. where used), etc.

2.4 Worker Clean-up

- .1 Before leaving the Work Area at the end of the work period all workers shall:
 - .1 Decontaminate protective clothing and respirator by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing personal protective equipment. If the protective clothing will not be reused, place it in an asbestos waste container.
 - .2 Clean footwear by wet wiping.
- .2 Proceed to designated washroom or sink and wash hands and face.
- .3 Maintain respirator and replace filters as necessary.

2.5 Re-activation of Equipment

- .1 Upon completion of work, complete the following:
 - .1 Remove locks and tags from electrical panel and re-energize the AHU being serviced.
 - .2 Conduct a general cleaning of the Work Area using wet mop methods or by using a HEPA vacuum.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .2 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .3 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
 - .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .4 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .5 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .6 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.

- .7 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .8 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .9 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
 - .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
 - .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
 - .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
 - .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

APPENDIX K
Conduit Installation Procedure between Double Drywall Ceiling and
Structure



1.0 PURPOSE AND BACKGROUND

The Ontario Health and Safety Regulations which apply to asbestos work on construction projects and in buildings and repair operations (O. Reg. 278/05) outlines the requirement for Type 2 procedures where asbestos-containing materials may be disturbed, as outlined in Section 12(3)11(ii) of Regulation 278/05.

2.0 SCOPE OF WORK

Before commencing, post caution tape and asbestos warning signs approximately 15 feet from where an unprotected worker could enter the asbestos work area.

Workers shall wear appropriate personal protective equipment (PPE) for the work (Tyvek suit, and full-face respirator with P100 filters). Provide washing facilities for the hands and face.

Remove metal decking and clean-up dust and debris on top of double drywall ceiling in the work area by following Type 2 asbestos procedures (i.e. damp wiping or by using a HEPA vacuum).

Run sections of conduit between space of the structural steel beam flanges and double drywall ceiling. Avoid direct contact with asbestos-containing fireproofing where possible.

Once straight runs of conduit have been placed, run wires and install couplings, fasteners, etc.

HEPA vacuum and/or wet wipe all areas affected by the work.

Repair any damage to the encasement which occurs immediately with a suitable lagging material, repair work should follow the procedures outlined in Appendix H of this AMP.

3.0 PERSONAL PROTECTION

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

Provide workers, at a minimum in all asbestos work areas in this procedure, with non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.

Respiratory protection shall be certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.

Respirators shall be:

- Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
- Assigned to a worker for their exclusive use.
- Maintained in accordance with manufacturer's specifications.



- Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
- Repaired or have damaged or deteriorated parts replaced.
- Stored in a clean and sanitary location.

Filters shall be tested and replaced as necessary according to manufacturer's specifications.

- Marked for rotation and regular replacement.

Personnel must have respirators fit tested by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.

Provide disposable coveralls, as follows, to all personnel:

- Made of a material that does not readily retain nor permit penetration of asbestos fibres.
- Consisting of head covering and full body covering that fits snugly at the ankles, wrists and neck.
- Replace or repair if torn or ripped.
- Dispose of protective clothing as ACM.

Decontaminate clothing or protective equipment by using a HEPA Vacuum, or by damp wiping prior to leaving the Asbestos Work Area:

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

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

Prohibit smoking, eating, drinking, chewing in the Work Area.

Before leaving work area, decontaminate shoes and protective clothing by using HEPA vacuum or damp wiping. When protective clothing is to be disposed of, it shall be decontaminated as above and placed in disposal bags. Workers shall vacuum all exposed skin, suit and respirator, and proceed to nearest washroom to wash hands and face.

4.0 CLEAN-UP AND DISMANTLING

Wash or HEPA vacuum equipment used in work area.

HEPA vacuum and/or wet wipe all areas affected by the work.

Seal openings in HEPA vacuums.



**Asbestos Management Program (MUMC)
Part B - Procedures**

Hamilton Health Sciences

Conduit Installation Procedure Between Double Drywall Ceiling and Structure

Pinchin File: 217420.028

Appendix K

Dispose of drop sheets by wetting the polyethylene, then folding into asbestos labelled bags to be disposed of as asbestos waste. Do not reuse drop sheets or enclosures.

Remove remaining site isolation, caution tape, signs, etc.

Before leaving work area, decontaminate shoes and protective clothing by using HEPA vacuum or damp wiping. When protective clothing is to be disposed of, it shall be decontaminated as above and placed in labelled disposal bags. Workers shall vacuum all exposed skin, suit and respirator, and proceed to nearest washroom to wash hands and face.

APPENDIX L
Guidelines for Management of Interstitial Space Hazards



As per the Hamilton Health Sciences (HHS) Asbestos Management Program (AMP), all of the interstitial space areas must have a Condition Survey completed annually. Interstitial spaces on all levels will be inspected once per year, with the exception of the active construction areas under the control of a contractor. Quality control contractor site reviews will be conducted on a weekly basis in the interstitial areas associated with a construction projects.

Weekly Inspections of the work area will be completed by the General Contractor, documenting and health and safety deficiencies within the interstitial space including, but not limited to damage to the asbestos-containing fireproofing and associated encasement. Detailed items will be marked on a map of the work area, flagged with tape and immediately remediated. The General Contractor will supply a list of the deficiencies to the project designate on a weekly basis.

Monthly inspections will take place in the interstitial space to review the work carried out by the General Contractor along with any work carried out by hospital maintenance staff with the potential to disturb asbestos-containing fireproofing, insulation, encasement or any other asbestos-containing materials. The Project Designate and the Hazardous Materials Specialist will be in attendance. Any deficiencies identified will be documented, including but not limited to damage to the asbestos-containing fireproofing and associated encasement. Detailed items will be marked on a map of the work area, flagged with tape and immediately remediated. The General Contractor will supply a list of the deficiencies to the Project Designate on a weekly basis.

1.0 INTERSTITIAL SPACE CONTROLS

All entry doors/elevators have been re-keyed to a new key way. New keys will be issued to Engineering staff and Security.

- All contractors entering the interstitial space must hold a valid green card training certification prior to entry. Contractors will also be required to log-in to the sign-in book located at the Engineering Department, or within the work area (for larger projects) stating the location and specific type of work being performed.
- All interstitial space lighting will be programmed off by the building automation. Requests for lighting to be turned on will be processed through Engineering. All lighting requests must be made via email at MUMClightingrequest@HHSC.ca. This request should be made at the earliest convenience possible.
- When a construction project is awarded and the contractor requires access to the interstitial space, the Project Designate will identify all entrance doors that the contractor can use to gain entrance to the interstitial space. On the entrance door to the work area, the contractor will post an interstitial log detailing each worker entering and leaving the space at all times.



2.0 INSPECTION PROCESS

Pre-project Inspection Process:

- The General Contractor will clearly outline/delineate the footprint of the project (or phase). At this time, the locks on the interstitial doors leading to the work area will be changed at the direction of the Project Designate.
- The Project Designate and Hazardous Materials Specialist will discuss the planned project scope of work in detail.
- The interstitial space will be inspected by the Project Designate, General Contractor and the Hazardous Materials Specialist. The purpose of the inspection is to identify health and safety and asbestos deficiencies along with noting the overall condition of the space. Identified deficiencies and hazards will be recorded on a map, pictures taken and any other methods required to clearly identify location of hazards.
- The Project Designate will work with the Hazardous Materials Specialist, Engineering, Facility Management and/or the HHS Abatement Contractor to repair, clean or remediate deficiencies identified.
- Once the deficiencies are remediated, the General Contractor, Project Designate and Hazardous Materials Specialist will collectively perform an inspection of the area and agree (or not) to hand over the area to the Contractor. It is expected that the work area will be returned in the same condition at the end of the project.

NOTE: in a multi-phase project, the above process will occur for each individual phase.

Weekly Inspection Report:

- Weekly Inspections of the work area will be completed by the General Contractor, documenting any health and safety deficiencies within the interstitial space including, but not limited to damage to the asbestos-containing fireproofing and associated encasement. Detailed items will be marked on a map of the work area, flagged with tape and immediately remediated. The General Contractor will supply a list of the deficiencies to the Project Designate at the end of each Thursday for the entire duration of the project.

Monthly Inspection Report:

- Monthly inspections will take place in the interstitial space to review the work carried out by the General Contractor along with any work orders carried out by hospital maintenance staff with the potential to disturb asbestos-containing fireproofing, insulation, encasement or other asbestos-containing materials. The Project Designate, Supervisor and the Hazardous Materials Specialist will be in attendance. Any deficiencies identified



will be documented, including, but not limited to damage to the asbestos-containing fireproofing and associated encasement. Detailed items will be marked on a map of the work area, flagged with tape and immediately remediated.

Pre & Post Inspection Report:

- The Project Designate, General Contractor and Hazardous Materials Specialist will inspect the area prior to the official post inspection.
- During this inspection, the decking is to remain unfastened in order to inspect beneath (if decking was removed).
- The inspectors will collectively look for any deficiencies within the work area, including the contractor's access route. All deficiencies will be noted on a map and with flagging tape for remediation.

Post Inspection Report:

- The Project Designate, General Contractor, the Hazardous Materials Specialist and a JHSC worker representative will be in attendance at the end of each project, or phase of a project.
- If there is mutual agreement between all parties that the area is in the same condition as it was handed over at the beginning of the project, then a project completion sign-off sheet shall be completed by the Project Designate and signed by all parties to acknowledge and record completion, refer to Appendix CC of this AMP.
- If deficiencies are identified, the General Contractor will immediately address the outstanding issues. An additional inspection will be required once completed.
- In a multi-phase project, the General Contractor will not proceed to the next phase until the previous phase is released back to HHS.

APPENDIX M
Asbestos Project Work Record



Asbestos Management Program

Hamilton Health Sciences
Asbestos Project Work Record

Pinchin File: 217420.028
Appendix M

ASBESTOS PROJECT WORK RECORD

Building: _____
(Building Address or Name)

Date: _____
(Today's Date)

Project: _____
(HHS Project Number or Purchase Order Number)

Project Type: Emergency Type 1 Type 2
 Planned Project Glove Bag Type 3

Area of Work: _____
(Room Name, Number, Floor etc.)

Description: _____
(Brief description of abatement, material, system, etc.)

Project Start Date: _____
(Mobilization date)

Project End Date: _____
(After dismantling/clean-up)

Contractor: _____
(Contracting firm or employee)

Telephone: _____
(Contractor or employee telephone)

Consultant: _____
(Name of consulting firm/contact if any)

Telephone: _____
(Consultant telephone)

Pre-Construction Survey for ACM performed, and report provided to Contractor?
 Yes No (Explain)

Air Sampling during abatement?
 Yes No



APPENDIX N
Asbestos Medical Surveillance Procedure



1.0 PURPOSE

To protect the health of workers by: ensuring fitness to perform asbestos-related work, evaluating pulmonary health and work history of workers and the possible association with performance of asbestos-related work, enabling remedial action to be taken when necessary and providing health education.

2.0 PROCEDURE

The medical surveillance for workers who have potential asbestos exposure was developed because of the potential long-term health effects associated with asbestos exposure. The medical surveillance program includes the following:

- pre-placement examinations;
- periodic medical examinations
- clinical tests;
- health education; and
- record keeping.

3.0 EMPLOYEE MEDICAL SURVEILLANCE

HHS departments, based on a review by the Health, Safety and Wellness (HSW) and the Hazardous Materials Specialist (HMS), will identify workers performing asbestos-related work, and those who may have previously been exposed to asbestos, who require medical surveillance.

The HMS will provide a copy of the annual Form 1 submitted to the Ministry of Labour to Employee Health Services (EHS).

The EHS Nurse will be advised in writing by the worker's department that the worker has performed asbestos-related work (Form 1). The EHS nurse will arrange for the appropriate initial medical examination, and will add the employee to the recall group, where testing is to be completed every 2 years (periodic medical examinations).

Worker participation in the workplace asbestos medical surveillance program is voluntary. Workers involved currently or previously in work which may result in exposure to asbestos are encouraged to participate in the medical surveillance program. Those workers choosing not to participate in the medical surveillance program are advised to discuss their potential for asbestos exposure with their own physician, and be followed on a regular basis.

EHS will send each worker identified one notice that he or she is encouraged to contact the EHS office to pick up necessary requisitions for surveillance testing. If the worker does not present to EHS, one reminder will be sent. This will occur biannually, on years indicated as medical surveillance years.



The EHS Nurse will maintain a recall list of all active employees requiring monitoring in the asbestos medical surveillance program to facilitate necessary recall for periodic medical examinations. The worker's department will notify (EHS) in writing if the worker ceases employment with HHS.

Workers who cease employment with HHS, who have participated in medical examinations conducted under the asbestos medical surveillance program, will be advised in writing that the surveillance should be continued by their personal physician. Each worker will be informed that copies of their medical record and a summary of their surveillance program can be forwarded to their physician upon written request.

4.0 PRE-PLACEMENT AND PERIODIC MEDICAL EXAMINATIONS

Medical examinations are offered to workers every 2 years, for workers identified as having current or previous potential for asbestos exposure

The clinical examination will include a medical questionnaire, clinical tests and a physical examination. Clinical tests may include a postero-anterior chest x-ray, and pulmonary function test.

Once notified that an employee must be included in the asbestos medical surveillance program, the EHS Nurse will add the employee's name to the list of those requiring bi-annual medical examinations and clinical testing.

Pursuant to the EHS Medical Directives for pulmonary function testing and PA chest radiographs, the EHS Nurse will order a pulmonary function test (spirometry) and PA chest radiograph, and request that the employee complete the Medical Evaluation Questionnaire for Respiratory Protection Users and Confined Space Entry in advance of arranging the asbestos medical surveillance program medical examination.

An assessment of fitness for work shall be based on the clinical examination in conjunction with the clinical tests.

5.0 HEALTH EDUCATION

At the time of the medical examination each employee will be offered information about the health effects of asbestos, use of PPE, and the importance of smoking cessation in preventing asbestos-related diseases.

6.0 FITNESS FOR WORK WITH ASBESTOS AND REPORTING

An assessment of fitness for work shall be based on the clinical examination in conjunction with the clinical tests. The Occupational Health Physician (OHP) shall inform the worker and HHS if the employee is fit, fit with limitations or unfit to work in an asbestos exposure. The OHP shall not give or disclose the records or results of the examination or tests, in advising HHS that the worker is fit with limitations or unfit to work in an environment with potential asbestos exposure because of a condition resulting from



exposure to asbestos.

If the OHP determines that signs of asbestos-induced disease are present, the worker shall be removed from performing asbestos-related work and be advised to complete a Safety Occurrence Report to report an occupationally acquired illness before consultation with the medical consultant of the Ministry of Labour and to the Workplace Safety and Insurance Board (WSIB). To qualify for compensation or rehabilitation further assessment by WSIB will be necessary. If asbestos induced disease is confirmed, the OHP shall then determine whether the worker is fit, fit with limitations or unfit.

Upon advising the employer and the worker that the worker, because of a condition resulting from exposure to asbestos, is fit with limitations or unfit for performance of asbestos-related work, the Safety Specialist shall advise the Joint Health and Safety Committee in writing.

In the circumstance above, where the OHP advises the employer that a worker is fit with limitations or is unfit for work in an environment with potential asbestos exposure, the Safety Specialist shall also notify the Provincial Physician, Ministry of Labour.

Where a worker is removed from exposure to asbestos because a physical examination or clinical test discloses that the worker may have or has a condition resulting from exposure to asbestos and suffers a loss of earnings occasioned thereby, the worker is entitled to compensation for the loss in the manner and to the extent provided by the Workplace Safety and Insurance Act.

7.0 RECORD KEEPING

A worker's health records, including records of exposures of the worker to airborne asbestos furnished by HHS, and results of the physical examinations and clinical tests of a worker, shall be kept in a secure place by the examining physician for the longer of:

- a period of forty years from the time such records were first made, or
- a period of twenty years from the time the last of such records were made.

Where the examining physician or his/her successor is no longer able or willing to keep the records, the records are to be forwarded to the Provincial Physician, Ministry of Labour, who will keep them in a secure place.

Copies of the exposure records and results of the physical examinations and clinical tests of a worker shall be given by the physician conducting the examinations or tests,

- to the worker or the worker's physician upon the request in writing of the worker; and
- in the case of a deceased worker, to the next of kin or personal representative of the worker, upon request in writing of such next of kin or personal representative, and any



**Asbestos Management Program (MUMC)
Part B - Procedures**

Hamilton Health Sciences
Asbestos Medical Surveillance Procedure

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Appendix N

authorization of another person by the worker or the worker's next of kin or personal representative is of no effect.

"Transfer of records." Whenever an employer ceases to do business and there is no successor employer to receive and retain records for the prescribed period or the employer intends to dispose of any records required to be preserved under this section, the employer shall consult the Medical Consultant, Occupational Health and Safety Branch, Ontario Ministry of Labour.

APPENDIX O

Letter of Notification to Tenants Regarding Asbestos in Premises



**Asbestos Management Program (MUMC)
Part B - Procedures**

Hamilton Health Sciences
Letter of Notification to Tenants Regarding Asbestos in Premises

Pinchin File: 217420.028
Appendix O

The following wording should be utilized in communicating the presence of asbestos to a tenant or lessee.

To Tenant Management Representative

This letter is being provided as notification of the presence of asbestos within the building at [address], Ontario. HHS has had an asbestos survey performed of the entire building and have established a program to manage all asbestos in a safe and prudent fashion. O. Reg. 278/05 requires notification of the building's tenants of the location of such material, as well as, notification of workers who may work in close proximity to the material and who may disturb it.

Our consultant inspected all areas of the building and made recommendations, where necessary, for removal or repair of asbestos. All such work [has been completed/will be completed shortly] with appropriate inspection and supervision. All asbestos remaining is subject to the Asbestos Management Program as required by Provincial Regulations and our own due diligence. A copy of the survey and Asbestos Management Program are available for review at the Engineer's Office.

The continuing presence of the remaining asbestos does not pose a risk of exposure to your employees as long as it remains under this management program. Staff that may disturb these materials have been given appropriate training and are aware of its presence. If you are planning maintenance or renovation work please notify the Hazardous Materials Specialist who will determine if the planned work will affect the asbestos in any way and provide information regarding necessary work practices and obligations to maintain a safe and healthy environment for your staff and contractors.

Please ensure that your staff and sub-contractors are aware of the above information. If you have any concerns please contact the facility management office at _____.

Building (Hospital & Address): _____

Tenant: _____

Name and Title: _____

Signature: _____

Date: _____

Owner Representative: _____

APPENDIX P
Contractor Notification and Acknowledgement Form



HHS has identified the presence of various friable and non-friable asbestos-containing materials in the Building. An asbestos inventory report showing the locations and amounts of these materials is available for viewing from the Project Designate.

Ontario Regulation 278/05 (Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations) applies to workers that may disturb asbestos materials. The disturbance of asbestos building materials are only to be undertaken by Asbestos Abatement Contractors that maintain the appropriate insurance coverage and meet the requirements set out in the Asbestos Management Program AMP. The following activities may disturb asbestos materials. The Project Designate must be notified prior to performing the following:

- Removal or repair of asbestos mechanical insulation or sprayed asbestos.
- Ceiling entry which may disturb sprayed fireproofing or mechanical systems insulation.
- Removal or repair of asbestos vinyl sheet flooring or vinyl floor tiles.
- Any other operation which may generate airborne asbestos from friable asbestos.
- Any removal, cutting or other disturbance of non-friable asbestos material (acoustic tiles, transite and floor tiles).
- Disturbing any material excluded from the survey.

Declaration by Contractor

The Contractor and their sub-contractors shall follow the work procedures as specified by HHS's Asbestos Management Program (AMP) and shall not disturb ACM without using proper procedures in accordance with Regulation 278/05 and this AMP.

HHS reserves the right to take any and all actions necessary to enforce safe asbestos work practices and strict adherence to the AMP and Regulation 278/05 including if necessary alerting the MOL to infractions on construction projects

We agree that our staff will not disturb asbestos-containing materials without prior notification to the Facility Manager. This firm and our staff will follow all procedures specified by the HHS Asbestos Management Program and/or O. Reg. 278/05. All asbestos waste will be packaged and disposed of in accordance with Ministry of the Environment requirements.

Notification of Asbestos Abatement

All contractors and HHS employees who perform work at facilities where ACM is present should be notified of the presence of the ACM if their work may bring them into contact or close proximity to the ACM and they may disturb it. This notification may include janitorial, security, telephone, computer



**Asbestos Management Program (MUMC)
Part B - Procedures**

Hamilton Health Sciences
Contractor Notification and Acknowledgement Form

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Appendix P

cabling suppliers, mechanical maintenance contractors, etc. This notification shall be performed by the Hazardous Materials Specialist or Project Designate.

It is the Contractor's responsibility to:

- Notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site (Notice of Project), as per Regulation 278/05, prior to commencing Type 3 abatement or Glove Bag abatement of more than one square meter of friable material.
- Notify Sanitary Landfill site as per Ontario MOE Regulation 347 as amended.
- Inform all sub trades of the presence of ACM identified in the contract documents.
- Notify the Project Designate if friable materials not identified in the contract documents are discovered during the course of the work. The contractor is to notify the MOL and the Joint Health and Safety Committee if the friable material is asbestos containing, as required by Regulation 278/05.

Building (Hospital & Address): _____

Project/Work Order: _____

Contractor: _____

Name and Title: _____

Signature: _____

Date: _____

Owner Representative: _____

APPENDIX Q
Asbestos Green Card Training



1.0 REQUIRED COMPONENTS

Hamilton Health Sciences (HHS) Asbestos Green Card Training (GCT) is intended to meet the requirements of the Ontario Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations (O.Reg.278/05, Section 8(3)(e)).

2.0 GREEN CARD TRAINING

- Overview of asbestos-containing materials at MUMC.
- Hazards of asbestos exposure.
- Overview of applicable regulations.
- Applicable safety procedures and emergency measures (ex. Reporting deficiencies within the mechanical spaces, interstitial space lighting procedure, working alone procedure, ceiling tile removal and handling, etc.).
- Detailed presentation on Type 1 and Type 2 asbestos procedures (including work both outside and inside the interstitial spaces and shafts).
- Personal hygiene and personal protective equipment to be observed when doing the work, and worker decontamination.
- Record keeping.
- Asbestos waste handling procedures and storage locations.
- Review of established HHS Varied Work Procedures.
- Review of interstitial management for contractors and workers.
- Written test.

3.0 ADDITIONAL REQUIREMENTS

- New or unusual procedures are introduced, reviewed and examined with applicable employees.
- Instruction in specific procedures provided by individual trade supervisors on an as needed basis.

4.0 GREEN CARD IDENTIFICATION

All participants in the GCT program will be issued a green card when all elements of the initial green card training have been successfully completed. Re-training of all individuals is required every two years, per current HHS requirements.



5.0 ENFORCEMENT

Contractor and other non-HHS personnel found to be in violation of O.Reg. 278/05 or HHS asbestos safety procedures will be disciplined by revoking their Green Card or escorted off the site, at the discretion of Project Designate and/or Hazardous Materials Specialist. Personnel will not be permitted back to the work site pending a full review by HHS and the contractor. The contractor will incur all costs associated with the review process. If HHS is not satisfied that a safety procedure violation will not occur again after this review, the personnel involved will not be permitted to return to the work site.

The AMP, GCT or O.Reg. 278/05 will be enforced through the HHS Progressive Discipline Policy for HHS staff.

APPENDIX R
Level 6 Inspection Reports

TITLE HHS MUMC – Level 6 Weekly Inspection Procedure	MANUAL/PROCEDURE NO.		SECTION	PAGE
	PROCEDURE EFFECTIVE (yyyy/mm/dd) 2015/11/15		REVISION DATE (yyyy/mm/dd)	1 of 3
	ISSUED BY (DEPT.) Facilities Management			REV.NO.
BUSINESS AREA/UNIT All Sites	AUTHORIZED BY			

Applies to: all *HHS/FHS Supervisors and Project Designates*

1.0 Definition & Scope

The purpose of the MUMC Level 6 weekly inspection is to ensure a safe workplace for all employees, contractors or any other occupants from exposure to asbestos within the Level 6 Penthouse and to maintain a clean and acceptable workspace. Additional to the weekly inspection, a semi-annual inspection will be conducted on the topside of all Air Handling Units (AHU) on Level 6. The semi-annual inspection on top of the AHU's will be conducted during the fall and spring seasons to avoid excessive temperatures during inspection. The semi-annual AHU topside inspection will be documented using the attachment found at the end of this document titled "Level 6 AHU Topside Inspection".

The weekly inspections will be used to identify any suspected asbestos-containing debris that could be present as a result of man-made or natural disruption to the asbestos-containing fireproofing on ceiling deck and beams, asbestos-containing pipe insulation and asbestos-containing drywall joint compound. The possible sources that create this debris includes, but is not limited to: rain leaks, storms, high wind, AHU vibrations, poor asbestos-abatement work practice, birds, uneducated workers impacting materials, and delamination due to age. This inspection will also include general housekeeping, construction debris as well as any other safety concerns.

Inspectors will follow a set rotating schedule issued by Facilities Maintenance. Only project designates (Cap. Dev. and FHS) with ongoing projects on Level 6 will be responsible for taking part in these required inspections during these noted projects.

TITLE HHS MUMC – Level 6 Weekly Inspection Procedure	MANUAL/PROCEDURE NO.		SECTION	PAGE
	PROCEDURE EFFECTIVE (yyyy/mm/dd) 2015/11/15		REVISION DATE (yyyy/mm/dd)	2 of 3
	ISSUED BY (DEPT.) Facilities Management			REV.NO.
BUSINESS AREA/UNIT All Sites	AUTHORIZED BY			

The following tools/items will be required during the weekly asbestos inspection of the level 6 penthouse:

- Level 6 Inspection Sheet
- Writing surface and pen
- Flashlight
- Camera (optional)
- Hazard Flagging Tape
- Caution Tape

2.0 Process

The Supervisor and Project Designates are responsible for the implementation of the weekly asbestos inspection on level 6. The findings will be noted and presented to the Hazardous Materials Specialist for action/direction on clean-up procedures and responsibilities.

The inspector(s) will physically walk accessible areas of level 6, marking any deficiencies found on the attached "Level 6 Inspection Sheet" found on the last page of this procedure. During the walkthrough, the inspectors will:

1. Look for and identify any suspected asbestos-containing debris present on visible surfaces, as well as general housekeeping items or safety concerns. All deficiencies will be marked using orange flagging tape.
2. If possible, look for any signs of delamination or possible causes of the source of debris and record the information on the inspection sheet. This allows measures to be taken to prevent further debris from occurring.

TITLE HHS MUMC – Level 6 Weekly Inspection Procedure	MANUAL/PROCEDURE NO.		SECTION N	PAGE 3 of 3
	PROCEDURE EFFECTIVE (yyyy/mm/dd) 2015/11/15	REVISION DATE (yyyy/mm/dd)	REV.NO.	
	ISSUED BY (DEPT.) Facilities Management			
BUSINESS AREA/UNIT All Sites	AUTHORIZED BY			

3. If large amount of debris is present, or has the possibility of being further disturbed (i.e. walked upon), the immediate area shall be blocked off with caution tape until abate has occurred and the area is deemed clean and accessible once again.
4. The area where a deficiency is observed shall be recorded on the inspection sheet, using the appropriate identifier from the legend.
5. If no deficiencies are found during an inspection, the inspection sheet must still be signed and dated, including a note that no deficiencies were found at the time of inspection.
6. Submit all completed inspection sheets and maps to the Hazardous Materials Specialist for record keeping.
7. All action items will be assigned to in house staff or abatement contractors as deemed necessary.

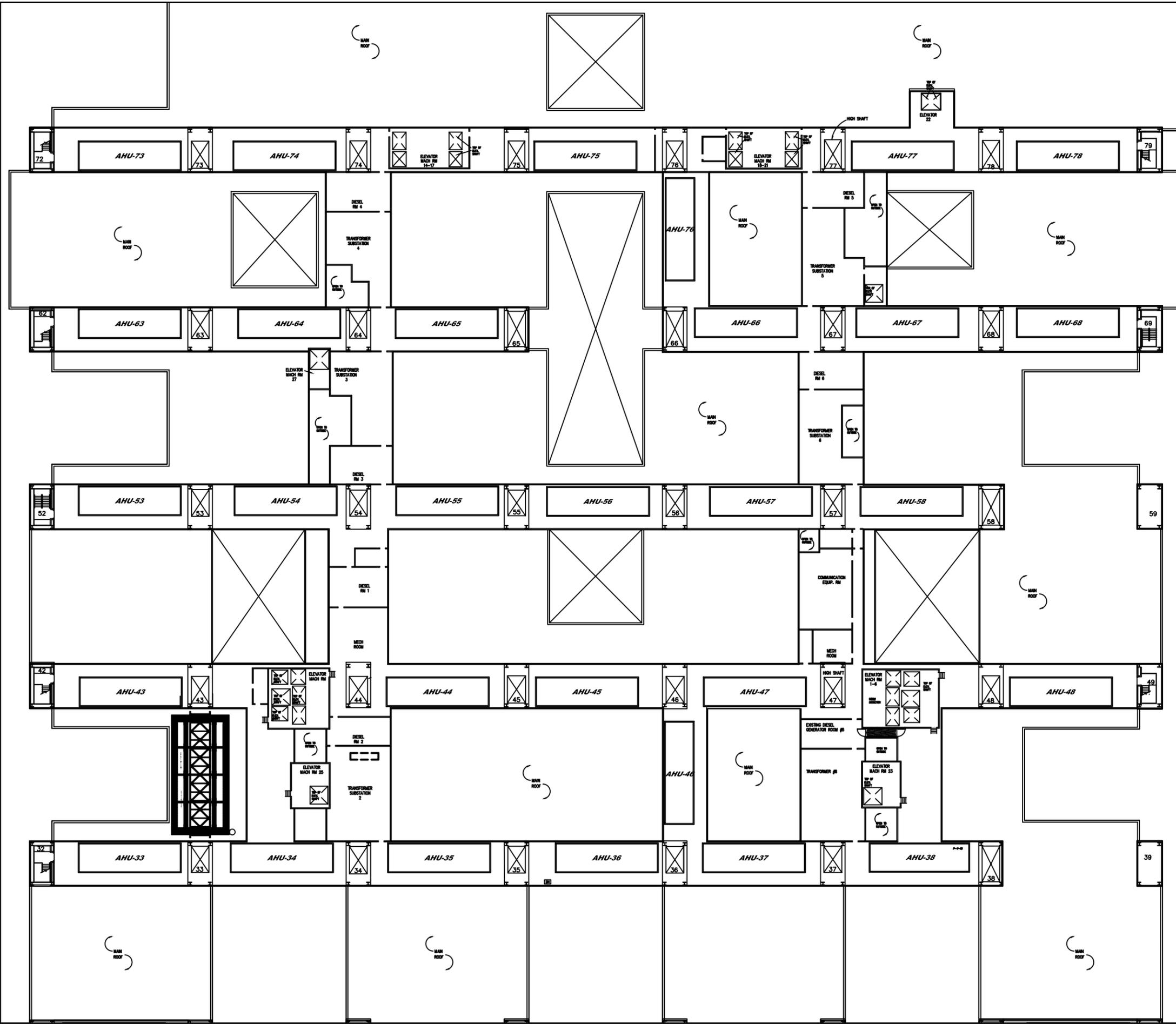
Should you have any questions or require clarifications, please contact the Hazardous Materials Specialist at ext. 75443.



Level 6 Inspection Sheet.pdf



6th Level AHU Inspection.pdf



LEGEND:

- ① BREACH ON ENCAPSULATED FIRE PROOFING
VACUUMING REQUIRED
- ② BREACH/DAMAGE ON FIRE SEPARATION
- ③ BREACH ON UPPER STEEL BEAM / CEILING DECK
- ④ CONSTRUCTION DEBRIS
- ⑤ MATERIAL LEFT OVER / GARBAGE
POOR HOUSE KEEPING
- ⑥ IMMEDIATE ACTION REQUIRED
(OTHER THAN ITEMS 1 TO 4):

NOTES:

MUMC - LEVEL 6

INSPECTION DATE: _____

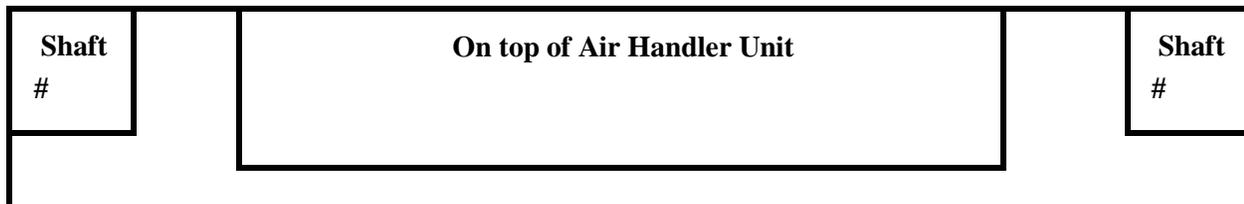
INSPECTED BY: _____

REPORT No: _____

LEVEL 6 – AHU TOPSIDE INSPECTION

Inspector:		Remedial Action		
Inspection W.O. #		HHS Clean-up W.O. #		
Inspection Date:		Remedial Action(s) taken	Sign	Date
Detailed Location*		<input type="checkbox"/> Area taped off		
Unit and Description:		<input type="checkbox"/> Signs posted		
		<input type="checkbox"/> PPE required in area		
		<input type="checkbox"/> Debris cleaned up by use of HEPA vacuum or wet wipe method		
		<input type="checkbox"/> Bag and disposed of debris		
		<input type="checkbox"/> Damage Repaired		
		<input type="checkbox"/> Other (please describe)		
Detailed Debris Description*		Corrective Action(s) taken	Sign	Date
Yes (debris present)	<input type="checkbox"/> Visual Inspection Completed			
Indicate size: <input type="checkbox"/> Small sawdust <input type="checkbox"/> Golf ball sized <input type="checkbox"/> Larger chunks <input type="checkbox"/> Other (describe)	Source of Debris based on Inspection: <input type="checkbox"/> Work in area <input type="checkbox"/> Birds/Animal Activity on 6 th level <input type="checkbox"/> Insulation Deterioration <input type="checkbox"/> Sprayed on Fireproofing	<input type="checkbox"/> Internally Repaired		
		<input type="checkbox"/> 3 rd Party Contractor Initiated		
		Type: 2 3 (circle)		
		Contractor:		
<input type="checkbox"/> No Debris	<input type="checkbox"/> Deterioration/Delamination	Work Order #		
Location History	<input type="checkbox"/> Unknown Source <input type="checkbox"/> Other (please explain)	<input type="checkbox"/> Notified supervisor of workers responsibilities regarding clean up procedures		
Indicate any recent debris noted in area, if applicable		<input type="checkbox"/> Supervisor notified workers of responsibilities regarding clean up procedures		
<input type="checkbox"/> Previous month		<input type="checkbox"/> Other (please describe)		
<input type="checkbox"/> Number of incidents in previous 3 months				
<input type="checkbox"/> Number of incidents in previous year		o Required work complete		
<input type="checkbox"/> None		Manager		
		HMS		

* Location description should include the approximate distance and direction from the debris to the closest Air Handling Unit or other identifiable structure.



Please indicate with an X where issues are on this diagram.

APPENDIX S

Type 3 Sprayed Fireproofing Abatement Procedure in the Interstitial Space

PART 1 GENERAL

1.1 General

- .1 The following Type 3 procedure is to be followed when removing and disposing of asbestos-containing sprayed fireproofing that is covered with an encasement material within the interstitial spaces at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 This procedure has been prepared solely for Hamilton Health Sciences (HHS) and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .3 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .4 All work outlined in this procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.
- .5 Submit Ministry of Labour Notice of Project Form prior to starting work.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, by appointment.

1.3 Instruction and Training

- .1 All workers and supervisory personnel performing work outlined in this procedure must submit the following prior to commencing with work:
 - .1 Proof in the form of a certificate that workers have been certified under the Ministry of Training, Colleges and Universities course 253W.
 - .2 Proof in the form of a certificate that supervisory personnel have been certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.
- .2 Provide instruction and training to all workers regarding the measures and procedures prescribed by this section; instruction and training must be provided by a competent person.

1.4 Personal Protection

- .1 Provide the following respiratory protection to all personnel:
 - .1 Full Face Powered Air Purifying Respirators with P100 high efficiency (HEPA) cartridge filters performing wet abatement of asbestos-containing sprayed fireproofing covered with an encasement material.
 - .2 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters for dismantling of Type 3 enclosures, using Type 2 Procedures.
- .2 Respirators shall be:

- .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
- .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
- .3 Assigned to a worker for their exclusive use.
- .4 Maintained in accordance with manufacturer's specifications.
- .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
- .6 Repaired or have damaged or deteriorated parts replaced.
- .7 Stored in a clean and sanitary location.
- .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .1 Replace cartridge filters for negative pressure respirator every 16 hours of wear unless tested on site.
 - .2 Replace PAPR cartridge filters every 8 hours of wear unless tested on site.
 - .3 Mark filters for rotation and regular replacement.
- .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Provide protective clothing, to all personnel which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
 - .4 Is disposed of as ACM.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations and HHS policies.
- .5 Provide site specific instruction to workers before allowing entry to Asbestos Work Area. Instruction shall include training on entry and exit from Asbestos Work Areas. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .6 Provide soap, shampoo and towels for use by all personnel when leaving the Asbestos Work Area.
- .7 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area and Decontamination Facilities.

1.5 Decontamination Facilities

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

- .1 Rooms, Occupied Areas and Asbestos Work Areas, shall be separated by curtained doorways at each door.
- .2 Contaminated Change Room: Room between Shower Room and Asbestos Work Area.
 - .1 Located on contaminated side of Shower Room.
 - .2 Install asbestos waste container for asbestos contaminated protective clothing.
 - .3 Install storage facilities for any personal protective equipment to be reused in Asbestos Work Area including boots, hard hats, etc., but excluding respirators.
 - .4 Install hooks and shelves as required for personal protective equipment.
 - .5 Minimum size of generally 2 m x 2 m. Increase size accordingly to accommodate number of workers.
- .3 Shower Room: Room between Clean Change Room and Contaminated Change Room.
 - .1 Install one walk through shower unit for every six workers.
 - .2 Install constant supply of hot and cold water, controllable at each shower. Water supply must be sufficient to provide water at a minimum temperature of 40 degrees Celsius (maximum 50 degrees) in a volume required for all workers to properly decontaminate.
 - .1 Install individual hot and cold shut-off valves on water supply located on clean side of Shower Room. Connect shower to these valves.
 - .2 Install individual controls inside the shower to regulate water flow and temperature.
 - .3 Install rigid piping or Shower Hose with watertight connections for supply and drains.
 - .4 Install a sealed drip pan under and around the showers, 150 mm deep.
 - .5 Install sump pumps, sufficient for volume of waste shower water from showers and drip pan. Direct waste shower water to sanitary drains.
 - .6 Install ground fault protected power switch on clean side of shower for sump pumps, or timed for shut off.
 - .7 Provide adequate quantity of soap, shampoo, clean towels
 - .8 Install an Asbestos Waste Container for disposal of used respirator filters, on the contaminated side of the Shower Room.
- .4 Clean Change Room: A room between the Shower Room and Occupied Areas.
 - .1 Install hooks and shelves on clean side of shower in clean Change Room for storage of respirators.
 - .2 Install lockers or hangers for workers' street clothes and personal belongings.
 - .3 Install vented wood door in wood frame at doorway to Occupied Area. Door must have locking passage set. Provide two keys to Asbestos Abatement Consultant and one to Owner.
 - .4 Install hose bib on domestic cold water pipe for connection on clean side of Asbestos Work Area.
 - .5 Install electric hot water heater/tank for showers in decontamination facility.

- .6 Provide ground fault protected power supply to hot water tanks, sump pump, battery chargers.
- .7 Install a fire extinguisher, mount to wall.
- .8 Minimum size of generally 2m x 2m. Increase size accordingly to accommodate number of workers.
- .5 Transfer Room: Room between Asbestos Work Area and Occupied Area, acting as an air lock for entry only into an Asbestos Work Area.
- .6 Designated Walkway to Decontamination Facilities: A designated path from Asbestos Work Area to decontamination facilities when the facilities are located remotely and not directly connected to the Asbestos Work Area.

1.6 Construction of Decontamination Facilities

- .1 Install floor protection as follows:
 - .1 Install one layer of rip-proof polyethylene sheeting over one layer of 6 mil polyethylene sheeting beneath entire decontamination facility.
 - .2 Turn 600 mm of polyethylene up the sides of the decontamination facility and overlap with the polyethylene sheeting covering the walls.
- .2 Install walls as follows:
 - .1 Around all rooms, between all rooms, at entrance to Asbestos Work Area and at entrance to Occupied Area.
 - .2 Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates.
 - .3 Install one layer rip-proof polyethylene sheeting on interior walls of Decontamination Facility.
 - .4 Install one layer rip-proof polyethylene sheeting both sides on interior dividing walls of Decontamination Facility.
 - .5 Install one layer rip-proof polyethylene sheeting on walls.
- .3 Install roof as follows:
 - .1 Install joists. Size of joists is to be determined by clear span. Consult Ontario building Code (Table A-1). For clear spans up to 2850 mm use SPF Select 38 x 140 mm wood joist at 400 mm o/c with continuous 38 x 140 mm wood headers, and install strapping beneath joists.
 - .2 Where roof is not exposed to the Asbestos Work Area, install one layer rip-proof polyethylene sheeting over joists.
 - .3 Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls.
 - .4 At underside of joists in all rooms, install one layer of polyethylene sheeting.
 - .5 Minimum interior clear height 2000 mm to underside of joist.
- .4 Curtained Doorways
 - .1 Construct as follows:
 - .1 Install two flap doors, full width and height of door opening at all doors between chambers, facilities and Asbestos Work Area.

- .2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head and alternate jambs.
- .3 Install weights attached to bottom edge of each door flap.
- .4 Provide direction arrows on flaps to indicate opening.
- .5 **Transfer Room**
 - .1 Construct as follows:
 - .1 Transfer Room to be generally 2000 mm x 2000 mm x 2200 mm high. Increase size accordingly to accommodate number of workers.
 - .2 Install walls as follows:
 - .3 Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates.
 - .4 Install one layer rip-proof polyethylene sheeting on interior walls of Transfer Room.
 - .5 Install one layer of rip-proof polyethylene sheeting over one layer of 6 mil polyethylene sheeting beneath entire Transfer Room.
 - .6 Install one layer rip-proof polyethylene sheeting over roof.
 - .7 Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls.
 - .8 Install a fire extinguisher, mount to wall.
 - .2 The transfer room is to be attached to the Work Area.
- .6 **Designated Walkway to Decontamination Facilities**
 - .1 Construct as follows:
 - .1 Install caution tape and asbestos warning signs to clearly identify the designated walkway.
 - .2 Install one layer of rip-proof polyethylene sheeting on floors and other finishes, equipment, etc. that cannot be readily cleaned within the designated walkway.

1.7 Signage

- .1 **Work Area Signs:** Post signs in both official languages at access points to the Asbestos Work Area and on hoarding walls as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
- .2 **Vehicles, Bins and Asbestos Waste Containers:** Post signs on both sides of every vehicle used for the transportation of asbestos waste and on every asbestos waste container. Signs must display thereon in large, easily legible letters that contrast in colour with the background the word "CAUTION" in letters not less than ten centimetres in height and the words:

- .1 CONTAINS ASBESTOS FIBRES
 - .2 Avoid Creating Dust and Spillage
 - .3 Asbestos May be Harmful to Your Health
 - .4 Wear Approved Protective Equipment.
- .3 Place placards in accordance with Transportation of Dangerous Goods Act.

1.8 Asbestos Abatement Work Area Entry and Exit Procedures

- .1 Entry Procedures:
 - .1 Use the following procedure to enter contaminated Asbestos Work Area:
 - .1 Remove street clothes in Clean Change Room.
 - .2 Store all street clothes, uncontaminated footwear, towels, etc. in the Clean Change Room.
 - .3 Put on respirator with new or tested filters, and protective clothing in Clean Change Room or clean side of Shower Room.
 - .4 Enter through the decontamination facility (i.e. shower and dirty room) and via designated walkway to the transfer room into the Asbestos Work Area.
 - .2 Exit Procedures:
 - .1 Use the following procedure to exit contaminated Asbestos Work Area:
 - .1 Inside the Asbestos Work Area, remove gross contamination from protective clothing using HEPA vacuum or by wet wiping.
 - .2 Proceed to transfer room and put on clean disposable coveralls and booties overtop contaminated protective clothing.
 - .3 Exit transfer room and proceed through the designated walkway to the decontamination facilities.
 - .4 Enter the Equipment and Access Room at the decontamination facility and remove all contaminated disposable clothing and equipment except respirator.
 - .5 Store contaminated footwear, hard hats, etc. in Equipment and Access Room.
 - .6 Proceed naked to shower while still wearing respirator.
 - .7 Shower, cleaning outside of respirator with soap and water. Thoroughly wet body, head and hair, remove respirator and wash body, head and hair. Wet clean inside of respirator face piece.
 - .8 Remove filters for testing or dispose of in container provided for this purpose. Remove after leaving the Shower but prior to entering the Clean Change Room.
 - .9 Proceed to the Clean Change Room, dry off and dress in street clothing.
 - .10 Maintain and disinfect respirator.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping using Type 2 Procedures as required by O. Reg. 278/05.
- .2 Install Worker Decontamination facilities, designated walkway and transfer room to the Asbestos Work Area.
 - .1 Designated walkway is to be inspected for cleanliness at the end of each work shift. If debris from asbestos-containing sprayed fireproofing is found on the floor or other horizontal surfaces then it is to be cleaned-up using a HEPA vacuum or wet wipe methods prior to leaving site.
- .3 Install signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.
- .4 Post Ministry of Labour Notice of Project.
- .5 Install one layer of rip-proof polyethylene sheeting to protect all equipment and finishes in the Asbestos Work Area that may be damaged. Items to remain include but are not limited to:
 - .1 Plumbing fixtures.
 - .2 Electrical Equipment.
 - .3 Mechanical Equipment.
- .6 Establish negative pressure in Asbestos Work Areas as follows:
 - .1 Install HEPA Filtered Negative Pressure Machines sufficient to maintain pressure differential of -0.02 inches of water between contaminated Asbestos Work Area and Areas outside of the Work Area.
 - .2 Arrange HEPA Filtered Negative Pressure Machines to maximize differential pressure in Asbestos Work Area.
 - .3 Operate HEPA Filtered Negative Pressure Machines continuously from first disturbance of ACM until completion of dismantling.
 - .4 Replace pre-filters frequently to maintain specified flow rate.
 - .5 Replace HEPA filters as required to maintain flow rate and integrity of unit.
 - .6 Discharge HEPA filtered negative pressure machines through existing exhaust ducting to the exterior of the building.
 - .1 Use polyethylene discharge ducting. Install and make airtight all negative air discharge ducting.
 - .2 Discharge ducting is not to be longer than required, and to be straight, so that the length of the ducting does not reduce the flow from negative pressure machines.
 - .7 DOP test all HEPA Filtered Negative Pressure Machines.
- .7 Provide one Ground Fault Panel for each 5,000 square feet (500 square metres) of Asbestos Work Area.

- .1 Ground Fault Interrupter Panel to use CSA approved equipment and be inspected by the Electrical Safety Authority.
- .2 Ensure safe installation by licensed electricians.
- .3 Connect to building power at electrical panel outside Asbestos Work Area.
- .4 Cable to be completely jacketed with no defects. Tag/mark cable as Live.
- .5 All electrical equipment used during work shall be supplied power from a Ground Fault Panel.
- .8 Install temporary lighting in all work areas at levels that will provide for a safe and efficient use of the work area.
- .9 Isolate, at panel, and disconnect existing power supply to Asbestos Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.
 - .1 Lock-out/tag-out power at electrical panels.
 - .2 Mark/tag any items within or passing through the Asbestos Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.
- .10 Install hoses with watertight connections and airless sprayers to wet asbestos-containing materials.
- .11 For HVAC systems to remain active within the Asbestos Work Area, perform the following:
 - .1 Seal ducts or equipment with two layers of rip-proof polyethylene sheeting over so as to make air tight.
 - .2 Smoke test seals regularly and maintain.
- .12 Install one layer of rip-proof polyethylene sheeting over one layer of 6 mil polyethylene sheeting on floor surfaces in Asbestos Work Area.
 - .1 Extend floor protection a minimum of 300 mm up all vertical surfaces in the Asbestos Work Area.
- .13 On walls within and forming the perimeter of the Asbestos Work Area install one layer of rip-proof polyethylene sheeting.
 - .1 At junction of floor and wall surface overlap floor polyethylene with wall polyethylene by a minimum of 300 mm at each layer. One layer of wall polyethylene must always overlap the top layer of floor polyethylene.

2.2 Wet Removal

- .1 Do not use compressed air to clean or remove dust or debris.
- .2 Spray encased asbestos-containing sprayed fireproofing with Amended Water using airless spray equipment prior to removal. Saturate ACM to prevent release of airborne fibres during removal.
- .3 Remove encased asbestos-containing sprayed fireproofing specified to be removed, clean substrate.

- .1 Fully saturated ACM may be scraped directly into waste containers or may be allowed to fall to floor.
- .4 All dislodged ACM shall be maintained in wet state until placed in asbestos waste containers for disposal.
- .5 As work progresses, and at regular intervals, place waste in asbestos waste containers and remove from the Asbestos Work Area.
- .6 After completion of gross asbestos removal work, perform the following:
 - .1 Wet clean surfaces from which encased asbestos-containing sprayed fireproofing has been removed with stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue asbestos-containing sprayed fireproofing.
 - .2 Wet clean surfaces which asbestos-containing sprayed fireproofing has fallen on using stiff bristle brushes, vacuums, wet-sponges etc. to remove all visible residue asbestos-containing sprayed fireproofing.
 - .3 Wet clean other surfaces in the Asbestos Work Area, including the decontamination facilities, equipment, polyethylene sheeting on floor and walls surfaces, ducts, pipes, etc.
 - .4 Remove wash water as contaminated waste.
 - .5 Remove waste.
 - .6 Remove and dispose of the pre-filters from all negative air units as asbestos-contaminated waste.

2.3 Maintenance of Contaminated Asbestos Work Area

- .1 Inspect Asbestos Work Area perimeter Hoarding Walls and Upper Perimeter Seals at the beginning and end of each working period and once on each day work does not take place. Inspection must be performed by competent person.
- .2 Inspect HEPA filtered negative pressure machines including discharge ducting at the beginning and end of each working period. Inspection must be performed by competent person.
- .3 Perform Differential Pressure Monitoring on a frequent basis and record pressure at start and end of shift at a minimum.
- .4 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.
- .5 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Asbestos Work Area.
- .6 Maintain Asbestos Work Area in tidy condition.
- .7 Remove waste and debris frequently.
- .8 Remove standing water on polyethylene/floor at the end of every shift.
- .9 Turn off water supply to hoses and reduce pressure in hose, prior to leaving the Asbestos Work Area at end of shift.
- .10 Turn off water supply to showers, at the end of every shift.

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

2.4 Waste and Material Handling

- .1 Waste bins must be placed on grade or in receiving.
- .2 All bins must be covered and locked when waste transfer is not being performed.
- .3 Clean and wash equipment prior to removal from Asbestos Work Area if removed prior to completion.
- .4 Place all equipment, tools and unused materials that cannot be cleaned in Asbestos Waste Containers.
- .5 As work progresses, and at regular intervals, transport the sealed and labelled asbestos waste containers from the Asbestos Work Area to waste bin.
- .6 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .7 Bin loading area and waste routes shall be kept clean at all times.
- .8 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owners operations.
- .9 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.
- .10 Co-operate with Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

2.5 Application of Post Removal Sealant

- .1 Wet Removal
 - .1 Obtain Asbestos Abatement Consultant's written permission to proceed.
 - .2 Apply one coat of Post Removal Sealant with an airless sprayer, in accordance with Manufacturer's Instructions, to cover all surfaces on all items in the Asbestos Work Area, including but not limited to polyethylene, ACM substrate, structural steel, and surfaces scheduled for demolition.
 - .1 Do not apply post removal sealant to materials that will be damaged by its application.
 - .3 Notify Asbestos Abatement Consultant at least 24 hours prior to the need for Milestone Inspection E (Air Monitoring Clearance). Obtain written approval of this Milestone Inspection before proceeding.

2.6 Air Clearance Monitoring

- .1 Site must be dry prior to Air Clearance Monitoring.
- .2 The number of Air Clearance Monitoring samples will be as follows:
 - .1 2 samples for less than 10 square metres.
 - .2 3 samples for 10 to 500 square metres.

- .3 5 samples for more than 500 square metres.
- .3 Prior to air clearance monitoring, install clean 20-inch fans for air circulation during Air Clearance Monitoring.
 - .1 At least one fan per 10,000 cubic feet of space in Asbestos Work Area.
 - .2 Install in centre of Asbestos Work Area and space evenly.
 - .3 The fan exhaust shall be directed upwards or toward the ceiling.
 - .4 The fans shall be operated on the lowest speed setting.
- .4 Restrict access to Asbestos Work Area and operate negative air units for a 12 hour period prior to Milestone Inspection E.
- .5 The HEPA filtered negative pressure machines shall be in operation during clearance air monitoring.
- .6 In the presence of the Asbestos Abatement Consultant, immediately prior to air clearance monitoring, use a leaf blower to dislodge loose fibre.
 - .1 Direct leaf blower against walls, ceilings, floors, and other surfaces.
 - .2 Perform this for at least five minutes per 1,000 sq. ft. of Asbestos Work Area.
- .7 PCM samples will be collected as per Air Monitoring Section.

2.7 **Asbestos Work Area Dismantling**

- .1 Use Type 2 worker precautions during dismantling.
- .2 Operate negative air units during dismantling.
- .3 Polyethylene, tape, cleaning material, etc. to be treated as asbestos waste.
- .4 Wash remaining equipment and tools used in contaminated Asbestos Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Asbestos Work Area.
- .5 Remove top layer of polyethylene sheeting from surfaces protected by two layers of polyethylene sheeting. The bottom layer of polyethylene will remain until all re-fireproofing is complete. Remove outer layer as follows:
 - .1 Remove asbestos contaminated Polyethylene by carefully rolling away from walls to centre of Asbestos Work Area.
 - .2 Remove visible fibres or residue found during removal of polyethylene using a HEPA vacuum.
- .6 Remove remaining polyethylene sheeting.
- .7 Remove water hoses and shut off at source.
- .8 Remove signage, decontamination facilities, transfer rooms, designated walkway, etc.
- .9 Seal vacuum hoses and fittings, flexible ductwork and all tools used in contaminated work site in 6 mil polyethylene bags prior to removal from Work Area.
- .10 Remove temporary lights.
- .11 Remove negative air unit pre-filters and dispose of as asbestos contaminated waste.

- .12 Remove HEPA filtered negative pressure machines and discharge ducting.
- .13 Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.
- .14 Repair encasement that may have been damaged from the work, repairs should be completed following the encasement repair procedures in Appendix H of Part B of this AMP.

2.8 Re-Establishment of Items

- .1 Upon completion of work:
 - .1 Remove and disconnect Ground fault Panel
 - .2 Clean, mop and vacuum Asbestos Work Area, Decontamination Facilities and Designated Walkway.

END OF PROCEDURE

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APPENDIX T

AHU Cleaning Type 3 Varied Work Procedure

PART 1 GENERAL

1.1 General

- .1 The following Type 3 varied procedure is to be followed when cleaning the interior of Air Handling Units (AHU) at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 The work is classified as a Type 3 operation under Section 12(4) 3 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05.
- .3 The varied procedures include: specific worker training in the varied procedures, varied personal protection equipment, varied worker decontamination procedures, varied site isolation procedures and varied air monitoring requirements.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.
- .7 Air monitoring during this varied procedure is to be conducted in accordance with the air monitoring requirements outlined in the HHS AMP.
- .8 Before commencing with this varied procedure notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, by appointment.

1.3 Varied Sections of O.Reg. 278/05

- .1 The following Sections of O.Reg. 278/05 are being varied as allowed under Section 23 of the Regulation:
 - .1 Section 18(4) 2 and 3 - Requirement for a polyethylene enclosure and decontamination facility with three separate rooms, constructed in sequence, and a shower for workers leaving the work area. Section 2 is being varied to only include caution tape surrounding the entrances to the AHU at a minimum of a 15 foot distance from any entrance to the AHU and work area, along with posting asbestos warning signs. This is equivalent as previous studies at MUMC have shown airborne fibre levels to be consistently below the Occupational Exposure Limit (OEL) for asbestos in the immediate vicinity of AHU cleaning, and the ability to close the doors to the AHU effectively isolates majority of the work

area. Section 3 shower requirements are being varied to only include a designated decontamination facility with no shower due to the low concentrations of asbestos present in airborne and surface dust during the work. Wash materials will be provided inside the work area to wash hands, face, tyvek suits and footwear. Workers will then proceed to the washroom located on the 40 line to fully wash their hands and face prior to exiting the 6th level.

- .2 Section 18(4) 4 – Requirement for the ventilation system servicing the work area to be disabled and all openings or voids to be sealed. Section 4 is being varied to only shut-down the AHU so that the interior of the unit can be cleaned. The fresh air and return air dampers must remain open so that they can be cleaned. The main supply dampers at the end of the unit will be sealed with polyethylene sheeting. As the unit will be shut-down and locked/tagged out no air movement will be going through the work area. In addition, as the unit is being cleaned so any fibres on surfaces will be removed by a surfactant and a rinsing and removed from the unit via the drains in the unit.
- .3 Section 18(4) 5 and 6 - Requirement for a HEPA filtered exhaust ventilation system maintained by a competent worker, taking replacement air from outside the work area, and monitoring the negative pressure differential. Sections 5 and 6 will be varied to only include HEPA filtered vacuums which will be in use at all times in the immediate vicinity of the work. The negative pressure precaution is not considered necessary due to the low concentrations of asbestos present in airborne and surface dust during the work as shown during previous studies at MUMC. Also, without an enclosure negative pressure within the work area is not feasible due to the fresh air intakes being open during the cleaning.
- .4 Section 18(4) 7 – Provides detailed requirements for the shower. Not required as per the reasons in item 1.3.1.1 above.
- .5 Section 18(4) 8 – Provides detailed requirements for worker decontamination. This will be modified to provide a designated worker decontamination area for removal of Personal Protective Equipment (PPE) and washing area.
- .6 Section 18(4) 15.1 – Negative air maintained during completion of the work. Not required as per Section 1.3.1.3.
- .7 Section 18(4) 16 – Air clearance sampling to occur once the work area is dry will be modified to accommodate the timing of the AHU shut-down. As the AHUs can only be shut-down for a 4 hour period the air clearance sampling will commence at the start of the work. The number of samples and minimum volume will still be followed for the air clearance sampling. In addition, one worker monitor sample will also be collected. The AHU will remain off until verbal confirmation that the air clearance samples are below the 0.01 f/cc limit. Air sampling will only occur periodically (bi-annually or once for every 8 units cleaned which-ever is greater) to ensure that these varied procedures provide equal protection to the workers. Air clearance sampling during AHU cleaning for construction projects will occur per project.

1.4 Instruction and Training

- .1 All workers and supervisory personnel performing work outlined in this varied procedure must submit the following prior to commencing with work:

- .1 Proof in the form of a certificate that workers have been certified under the Ministry of Training, Colleges and Universities course 253W.
- .2 Proof in the form of a certificate that supervisory personnel have been certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.
- .2 Provide instruction and training to all workers regarding the measures and procedures prescribed by this section; instruction and training must be provided by a competent person.

1.5 Personal Protection

- .1 Provide the following respiratory protection to all workers:
 - .1 Non-powered full-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
 - .3 Provide protective clothing to all workers, which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
 - .4 Is disposed of as ACM.
 - .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations and HHS policies.
 - .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.

- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, pre-clean all surfaces outside of the AHU where possible without disturbing asbestos-containing materials using a HEPA vacuum or damp cloth.
- .2 Shut down the AHU to be serviced.
- .3 Upon Shut-down of the AHU, isolate the panel and disconnect the existing power supply to the Work Area. Power supply to remaining areas of the building are not to be disrupted during filter change work.
 - .1 Lock-out/tag-out power as per HHS policy.
 - .2 Mark/tag any items within or passing through the Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.
- .4 Provide power from GFI equipped circuits in accordance with Occupational Health and Safety Act of Ontario and Regulations for Construction Projects to be used by equipment within the Asbestos Work Area.
- .5 As required, install temporary lighting in the Work Area that is consistent with the Occupational Health and Safety Act of Ontario.
- .6 Install caution tape barrier to restrict access to only personnel performing the work; caution tape is to be at least 15 feet from all points of work.
- .7 Install signage in clearly visible locations, at all entrance points to the Work Area and in sufficient numbers to adequately warn unprotected workers of an asbestos dust hazard.
- .8 Install curtained Doorways at the entry door to the Work Area inside the AHU.
- .9 Establish a designated worker decontamination area. Indicate area with signs, and provide a designated route for workers to walk from the Work Area to decontamination area.
 - .1 Equip decontamination worker decontamination area with soap, water and towels.
- .10 Seal openings in walls, floor, ceiling, floor drains, filter banks, dampers (i.e. only if filters are not being changed), etc. of the AHU using polyethylene and tape. Type 2 procedures are to be followed when installing seals within the AHU.
 - .1 Floor drains inside the AHU are to be protected with drain socks; dispose of drain socks as asbestos waste upon completion of work.
- .11 If moisture eliminator filters are being removed, then cover floors adjacent to and beneath moisture eliminator filters with polyethylene drop sheets before commencing removal of filters. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers. Support polyethylene in place.

- .12 Install one layer of 6 mil polyethylene sheeting so as to protect all equipment in the Work Area that may be damaged or difficult to clean. Items to remain include but are not limited to:
 - .1 Electrical Equipment.
 - .2 Mechanical Equipment.
- .13 Post Ministry of Labour Notice of Project at the designated entrance to the work area.
- .14 Place required equipment and materials in the Work Area.
- .15 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .16 Do not use compressed air to clean or remove dust or debris.

2.2 **Cleaning of AHU**

- .1 If moisture eliminate filters are being removed, then cleaning inside the AHU should only commence after filters have been removed.
 - .1 If moisture eliminator filters are being removed, then complete the following:
 - .1 Remove filters using non-powered hand held tools only by undoing fasteners, clean filters upon removal and place directly into 6 mil polyethylene bags; filters are to be double bagged prior to removal from the work area.
 - .2 Upon removal of the cleaned and bagged filters from the AHU, transport them to a designated storage location.
 - .2 Spray or mist surfaces to be cleaned with amended water using an airless sprayer or garden mister.
 - .3 Once the areas have been wetted, apply a degreasing agent with an airless sprayer.
 - .4 Upon application of a degreasing agent, surfaces may be scrubbed using hand held brushes and/or cloths; surfaces are to remain during the cleaning work.
 - .1 Apply additional amended water or degreasing agent may be applied to keep surfaces wet.
 - .5 Upon completion of degreasing and cleaning work and once all surfaces have been adequately cleaned, rinse all surfaces within the AHU with water using a garden hose that is not equipped with a nozzle that increases pressure. Pressure washing methods are not to be used.
 - .6 Following the rinsing of all surfaces, clean the work area using HEPA vacuums, mops, cloths, squeegees, etc. free of contaminated water.
 - .7 Upon cleaning of AHU, transport cleaned and bagged moisture eliminator filters, if removed, back to the inside of the AHU and re-install.
 - .8 Dispose of any used wipes, cloths, brushes, drain socks, etc. as asbestos waste.
 - .9 Ensure all items have been removed from within the AHU and the work area is clean and all materials have been cleaned or disposed of properly prior dismantling the site isolation.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene sheeting, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene sheeting used for drops sheets, seals, etc. is not to be reused and is to be rolled-up and placed into asbestos waste containers.
- .3 Remove caution tape barrier, signage, temporary lighting (i.e. where used), etc.

2.4 Worker Clean-up

- .1 Before leaving the Work Area at the end of the work period all workers shall:
 - .1 Decontaminate protective clothing and respirator by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing personal protective equipment. If the protective clothing will not be reused, place it in an asbestos waste container.
 - .2 Clean footwear by wet wiping.
- .2 Proceed to designated washroom or sink and wash hands and face.
- .3 Maintain respirator and replace filters as necessary.

2.5 Re-activation of Equipment

- .1 Upon completion of work, complete the following:
 - .1 Remove locks and tags from electrical panel and re-energize the AHU being serviced.
 - .2 Conduct a general cleaning of the Work Area using wet mop methods or by using a HEPA vacuum.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .2 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .3 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
 - .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.

- .4 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .5 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .6 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.
- .7 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .8 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .9 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .10 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
 - .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
- .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
- .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
- .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

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APPENDIX U

Diffuser Cleaning Type 3 Varied Work Procedure

PART 1 GENERAL

1.1 General

- .1 The following Type 3 varied procedure is to be followed when cleaning diffusers at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario. Cleaning dust from surfaces such as: ceilings, walls, furniture, equipment, etc., around diffusers can be completed without asbestos procedures.
- .2 The work is classified as a Type 3 operation under Section 12(4) 3 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05.
- .3 The varied procedures include: specific worker training in the varied procedures, varied personal protection equipment, varied worker decontamination procedures, varied site isolation procedures and varied air monitoring requirements.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.
- .7 Air monitoring during this varied procedure is to be conducted in accordance with the air monitoring requirements outlined in the HHS AMP.
- .8 Before commencing with this varied procedure notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, by appointment.

1.3 Varied Sections of O.Reg. 278/05

- .1 The following Sections of O.Reg. 278/05 are being varied as allowed under Section 23 of the Regulation:
 - .1 Section 18(4) 2 and 3 - Requirement for a polyethylene enclosure and decontamination facility with three separate rooms, constructed in sequence, and a shower for workers leaving the work area. Section 2 is being varied to only include closing a door to the work area and posting asbestos warning signs as long as it restricts access to the work area. Alternatively, a portable enclosure may be used for public areas or areas which cannot be contained by closing doors. This is equivalent as previous studies have shown airborne fibre levels to be consistently below the Occupational Exposure Limit (OEL) for asbestos in the

immediate vicinity of diffuser cleaning, and the ability to close the doors to a room or using a portable enclosure effectively isolates the work area. Section 3 shower requirements are being varied to only include washing a workers hands and faces with no shower due to the low concentrations of asbestos present in airborne and surface dust during the work. Wash materials will be provided inside the work area to wash hands, face, tyvek suits and footwear.

- .2 Section 18(4) 4 – Requirement for ventilation system servicing the work area to be disabled and all openings or voids to be sealed. Section 4 is being varied to only shut-down air to the work area by cutting off the supply or return air to an area at the VAV box. The air handling unit will not be shut down. As the VAV box will be shut down and locked and tagged out no air movement will be going through the work area.
- .3 Section 18(4) 5 and 6- Requirement for a HEPA filtered exhaust ventilation system maintained by a competent worker, taking replacement air from outside the work area, and monitoring the negative pressure differential. Sections 5 and 6 will be varied to only include HEPA filtered vacuums which will be in use at all times in the immediate vicinity of the work. The negative pressure precaution is not considered necessary due to the low concentrations of asbestos present in airborne and surface dust during the work as shown during previous studies.
- .4 Section 18(4) 7 – Provides detailed requirements for the shower. Not required as per the reasons in item 1.3.1.1 above.
- .5 Section 18(4) 8 – Provides detailed requirements for worker decontamination. This will be modified to provide a designated worker decontamination area for removal of Personal Protective Equipment (PPE) and washing area.
- .6 Section 18(4) 15.1 – Negative air maintained during completion of the work. Not required as per item 1.3.1.3 above.
- .7 Section 18(6) 2 – Use of forced air during clearance air monitoring. Not used due to the methods being used to clean diffusers (i.e. within closed rooms or mobile enclosures).
- .8 Section 18(4) 16 – Air clearance sampling is being modified to only conduct random air sampling. Studies at MUMC have shown very low to undetectable levels of asbestos fibres within the work area, worker monitors and outside the work area during diffuser cleaning. Previous sampling of dust on diffusers at MUMC reported non-detect levels of asbestos. The number of samples and minimum volume will still be followed for the air clearance sampling when conducted. The VAV box will remain off until verbal confirmation that the air clearance samples were below the 0.01 f/cc limit, where sampling is conducted. Air sampling during diffuser cleaning for maintenance work will only occur periodically (bi-annually or once for every 500 diffusers cleaned which-ever is greater) to ensure that these varied procedures equal or better protection to the workers. Air sampling during diffuser cleaning for construction projects will occur per project.

1.4 Instruction and Training

- .1 All workers and supervisory personnel performing work outlined in this varied procedure must submit the following prior to commencing with work:

- .1 Proof in the form of a certificate that workers have been certified under the Ministry of Training, Colleges and Universities course 253W.
- .2 Proof in the form of a certificate that supervisory personnel have been certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.
- .2 Provide instruction and training to all workers regarding the measures and procedures prescribed by this section; instruction and training must be provided by a competent person.

1.5 Personal Protection

- .1 Provide the following respiratory protection to all workers:
 - .1 Non-powered full-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
 - .3 Provide protective clothing to all workers, which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
 - .4 Is disposed of as ACM.
 - .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations and HHS policies.
 - .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.

- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, pre-clean all surfaces within the work area where possible without disturbing asbestos-containing materials using a HEPA vacuum or damp cloth.
- .2 Shut down the HVAC system or isolate the work area through VAV boxes.
 - .1 Lock-out/tag-out the HVAC system as per HHS policy.
 - .2 HVAC to remaining areas of building must not be disrupted during work of this section.
 - .3 System shall remain inoperative until completion of work.
- .3 As required, install temporary lighting in the work area that is consistent with the Occupational Health and Safety Act of Ontario.
- .4 Set-up room entire room as work area. Install signage at each door to the work area and ensure all occupants have been notified of the room being closed and to adequately warn of an asbestos dust hazard.
- .5 Post Ministry of Labour Notice of Project at the designated entrance to the work area.
- .6 In order to accommodate various work area site conditions, site protection is to be erected using either of the following options:
 - .1 Option #1 - cover floors adjacent to and beneath diffusers to be cleaned with polyethylene drop sheets before commencing with diffuser cleaning. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers; support polyethylene drop sheets in place.
 - .1 All furniture and equipment in the work area is to be covered and protected with rip-proof polyethylene sheeting.
 - .2 Option #2 – erect a mobile enclosure directly beneath the diffuser to be cleaned. Erection of the mobile enclosure is to be completed in such a way that there is a continuous seal between the finished clearing and mobile enclosure.
- .7 Establish and install a designated worker and waste decontamination area within the Work Area.
 - .1 Equip decontamination worker decontamination area with soap, water and towels.
- .8 Place required equipment and materials in the Work Area.
- .9 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .10 Do not use compressed air to clean or remove dust or debris.

2.2 Cleaning of Diffusers

- .1 Spray or mist diffusers to be cleaned with amended water using an airless sprayer or garden mister. Once the diffuser has been wetted attempt to clean the diffuser with a HEPA vacuum.
- .2 If a HEPA vacuum is ineffective at cleaning the diffuser then proceed with cleaning the diffuser using damp wipe methods.
- .3 If damp wiping is ineffective at cleaning the diffuser then apply a degreasing agent with an airless sprayer or garden mister and damp wipe.
 - .1 Where a degreasing agent is used to clean the diffuser then ensure that the diffuser is sprayed with amended water and wiped down at the completion of work in order clean off any residual degreasing agent from the diffuser.
- .4 Amended water or degreasing agent is to be applied to the diffuser, as necessary, throughout the process in order to keep surfaces wet.
- .5 If diffuser cleaning is being completed due to a construction project, then upon cleaning, seal all diffusers with polyethylene sheeting until the end of the project.
- .6 Rags, cloths, towels, etc. used to clean the diffusers are to be disposed of as asbestos waste.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene sheeting, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene sheeting used for drops sheets, covering furniture and equipment, etc. is not to be reused and is to be rolled-up and placed into asbestos waste containers.
- .3 Where a mobile enclosure is used as site protection, clean all surfaces within the mobile enclosure prior to dismantling.
 - .1 Mobile enclosures designed for reuse are not required to be disposed of as asbestos waste and may be reused for future diffuser cleaning.
- .4 Remove signage, temporary lighting (where used), etc.

2.4 Worker Clean-up

- .1 Before leaving the Work Area at the end of the work period all workers shall:
 - .1 Decontaminate protective clothing and respirator by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing personal protective equipment. If the protective clothing will not be reused, place it in an asbestos waste container.
 - .2 Clean footwear by wet wiping.
- .2 Proceed to designated washroom or sink and wash hands and face.
- .3 Maintain respirator and replace filters as necessary.

2.5 Re-activation of Equipment

- .1 Upon completion of work, complete the following:

- .1 Remove locks and tags from electrical panel and re-energize the HVAC system or VAV box.
- .2 Conduct a general cleaning of the Work Area using wet mop methods or by using a HEPA vacuum.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .2 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .3 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
 - .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .4 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .5 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .6 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.
- .7 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .8 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .9 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.

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

3.2 Signage

- .1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
 - .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
 - .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
 - .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
 - .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

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APPENDIX V
HEPA-filtered Drilling Type 2 Varied Work Procedure

PART 1 GENERAL

1.1 General

- .1 The following Type 2 varied procedure is to be followed when drilling into or installing and removing screws in drywall walls and ceilings finished with asbestos-containing joint compound using a powered drill equipped a D1905 4" BitBuddie dust shroud that is attached to a HEPA vacuum at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 The work is classified as a Type 2 operation under Section 12(3)8 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05. Testing included; personal, area and reference air sampling during drilling work and bulk sampling of drywall joint compound on walls within the test location.
- .3 The varied procedures include: specific worker training in the varied procedures, varied personal protection equipment, varied worker decontamination procedures and varied site isolation procedures.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, by appointment.
- .2 Drywall joint compound, containing chrysotile asbestos, is present on finished original drywall walls and ceilings throughout the building.
 - .1 Unfinished double drywall ceilings (i.e. no joint compound present) are present above the asbestos-containing and non-asbestos lay-in ceiling tiles throughout the building.

1.3 Instruction and Training

- .1 Provide instruction and training to all workers, which should include the following:
 - .1 Hazards of asbestos.
 - .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that may be used and worn during work outlined in this varied procedure, including:
 - .1 Limitations of equipment.

- .2 Inspection and maintenance of equipment.
- .3 Proper fitting of equipment.
- .4 Disinfecting and cleaning of equipment.
- .3 Personal hygiene to be observed when performing the work.
- .4 The measures and procedures prescribed by this section.
- .5 Instruction and training must be provided by a competent person.

1.4 Personal Hygiene

- .1 Asbestos Personal Protection Equipment (PPE) is not required, unless it is requested by the worker, where asbestos PPE is requested by the worker then the following should be provided:
 - .1 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Disposable protective clothing.
- .2 Where respiratory protection is requested by the worker, respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit tested by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Where protective clothing is requested by the worker, provide protective clothing which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable safety regulations and HHS policies.
- .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.

- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Cover floors which cannot be readily cleaned (i.e. carpet) at the completion of the work in the Work Area with polyethylene or rip-proof polyethylene drop sheets to permit cleaning of the Work Area.
- .2 Install caution tape barrier to restrict access to only personnel performing the work. Post HHS varied work procedure warning signs at caution tape barrier.
- .3 Place required equipment and materials in the Work Area.
- .4 HVAC system servicing the Work Area may remain operational.
- .5 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .6 Do not use compressed air to clean or remove dust or debris.

2.2 HEPA Filtered Drilling into Drywall Walls and Ceilings Finished Asbestos-containing Joint Compound

- .1 Wet all areas of the drywall wall or ceiling to be affected by the work with amended water in order to control the spread of dust.
- .2 Connect D1905 4" BitBuddie dust shroud to HEPA vacuum.
- .3 Turn-on HEPA vacuum and allow air flow to secure the dust shroud to the drilling location on the drywall wall or ceiling.
- .4 Proceed with drilling to either drill a hole or install and remove screws in the drywall wall or ceiling, allowing the dust shroud to capture dust from the work being performed.
- .5 Upon completion of drilling work, remove dust shroud and clean drilling location on the drywall wall or ceiling using a HEPA vacuum or wet wipe methods.
- .6 Complete any remaining work to completed, such as installing plastic wall anchors, hanging wall mounted items, installing conduit, etc.

2.3 Clean-up and Dismantling

- .1 Clean dust shroud using a HEPA vacuum or wet wipe methods.
- .2 Clean Work Area, polyethylene drop sheets, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .3 Polyethylene drop sheets, where used, are not to be reused and are to be rolled-up, placed into asbestos waste containers.
- .4 Remove caution tape barrier and HHS varied work procedure warning signs.

2.4 Worker Clean-up

- .1 Proceed to designated washroom or sink and wash hands and face.
- .2 If protective clothing and respirator were worn, then the following shall apply:

- .1 Protective clothing should not be reused and be placed in an asbestos waste container.
- .2 Maintain respirator and replace filters as necessary, only where worn by the worker.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .2 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
 - .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .3 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .4 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .5 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .6 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .7 Sprayer: portable manual sprayer.
- .8 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 HHS Varied Work Procedure Warning Signs: Post signs in both official languages at access points to the Work Areas. Refer to attached signage at the end of this document for reference.

3.3 Waste and Material Handling

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

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
 - .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
 - .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
 - .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

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APPENDIX W

Type 2 Variance for Entering or Working on AHU's



1.0 OBJECTIVES

This document is intended for use during the maintenance of air handling equipment at McMaster University Medical Centre (MUMC). This procedure has been developed to protect the worker conducting maintenance activities and the building occupants and visitors.

Under Ontario Regulation 278/05 Section 12(4) Item 3 defines “cleaning or removing air handling equipment, including rigid ducting but not including filters, in a building that has sprayed fireproofing that is an asbestos-containing material” as a Type 3 operation. Entering or performing maintenance activities such as conducting inspections, changing belts, greasing or replacing bearing and shafts, removing guards from equipment and opening access hatches on air handling equipment do not fall under the definition of Type 3 work. These types of work should be classified as a Type 2 operation under Section 12(3) Item 11 of the regulation as “any other work that may expose a worker to asbestos”.

The basis for removing some of the precautions is due to the extensive air sampling conducted. Pinchin prepared a summary report of air sampling conducted from 1979 to December of 2012 (Interstitial Space Risk Assessment Report, dated December 13, 2013, Pinchin File No 79177). The report outlines hundreds of air samples conducted with only 4 confirmed to exceed the Time Weighted Average Exposure Value (TWAEV) of 0.1 fibres/cc and all of these were collected during active Type 3 disturbances of asbestos-containing material. Between 2013 and 2014 HHS conducted extensive personal and area air sampling (over 35 air samples) during removal of ductwork and cleaning of air handling equipment, with no samples which exceeded the TWAEV. As the air sampling conducted was during extensive physical disturbance of ductwork and air handling equipment and did not show elevated fibre levels there is little likelihood of airborne asbestos exposure during maintenance activities. In 2013, HHS also conducted bulk sampling of the air filters located in the air handling units on the 6th level and all samples were non-detect for asbestos.

Based on the air sampling performed and the lack of asbestos found in air and bulk sampling, workers performing maintenance activities or entering air handling equipment for the purpose of inspection will only be required to wear a half face HEPA filtered (P100) respirator.

2.0 SUBSTITUTED MEASURES AND PROCEDURES

Section / Item in Ontario Regulation 278/05 for which variance will be applied	Varied Procedures
15(1)1 and 2 – Signs	The varied procedure will allow maintenance staff to work without placing asbestos hazard signage. As very little work and disturbance to potential



	asbestos dust will occur signs warning of an asbestos hazard will not be necessary, however standard caution tape is to be installed at either end of the AHU while work is taking place
15(12) – Protective Clothing	As very little work and disturbance will occur protective clothing will optional for the worker.
16(4) – Drop Sheets	As these types of maintenance activities produce virtually no dust a drop sheet will not be used. The installer will wet wipe the wall and floor directly below the work area as a precautionary measure if any dust is generated.
16(6) – PPE Removal	If protective clothing is not used, PPE removal/cleaning will not be required. If protective clothing is requested, coveralls should be worn with the hood in place at all times. Suit and head cover shall remain in place until worker leaves the work area. Boot covers are required if wet wiping or HEPA vacuuming cannot effectively clean footwear.

Workers will be required to wear half-face HEPA filtered (P100) respirators. Workers will be required to wash their hands in a public washroom prior to taking a break.

The following is the procedure:

- The doors to the AHU shall remain open always, while working inside the AHU;
- The air handling equipment will be shut down with proper lock-out tag-out procedures;
- The worker will don the half-face HEPA filtered respirator prior to entering the AHU;
- The worker will enter the air handling unit and/or conduct any maintenance activities which may be required;
- The worker will wet wipe the wall and floor surfaces (if dust is generated) and dispose of the wipes as non-asbestos waste;
- The worker shall remove the respirator after exiting the AHU;



Asbestos Management Program (MUMC)
Part B - Procedures

Hamilton Health Sciences
Type 2 Variance for Entering or Working on Air Handling Equipment

Pinchin File: 217420.028
Appendix W

- The unit can then be turned back on;
- The worker will either wipe their hands with a damp cloth or wash their hands prior to taking a break.

Any cleaning or removal activities will be conducted as a Varied Type 3 as outlined in Appendix T or Y.
Any HVAC filter adjustments/replacements will be carried out in accordance with Appendix J.

APPENDIX X
HHS Asbestos Work Area Signage

DANGER ASBESTOS DUST HAZARD

Access Restricted to Workers Wearing PPE as
Detailed Below

Scope of Work			
Companies Involved		Contact and Phone	
Classification of Work		PPE Required	
Project Name			
Start Date		Est. End Date	
Posted by: (Name/contact No.)		Date, time posted:	

*Post Varied Type 3 procedures at the entrance of the asbestos work area if the Varied Procedures differ from what is written in the HHS AMP. Ensure Varied Procedures have been submitted to the JHSC, as necessary.

APPENDIX Y

Stand-alone HVAC Unit Cleaning Type 3 Varied Work Procedure

PART 1 GENERAL

1.1 General

- .1 The following Type 3 varied procedure is to be followed when cleaning the interior of stand-alone Heating Ventilation and Air Conditioning (HVAC) units at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario. This procedure is limited to the following types of stand-alone HVAC Units: Modines, Air Curtains, HV Units and A/C Split Units. This procedure does not apply when cleaning interior of the Air Handling Units (AHU's) located on Level 6.
- .2 The work is classified as a Type 3 operation under Section 12(4) 3 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures testing; has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05.
- .3 The varied procedures include: specific worker training in the varied procedures, varied personal protection equipment, varied worker decontamination procedures, varied site isolation procedures and varied air monitoring requirements.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.
- .7 Air monitoring during this varied procedure is to be conducted in accordance with the air monitoring requirements outlined in the HHS AMP.
- .8 Before commencing with this varied procedure notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, by appointment.

1.3 Varied Sections of O.Reg. 278/05

- .1 The following Sections of O.Reg. 278/05 are being varied as allowed under Section 23 of the Regulation:
 - .1 Section 18(4) 2 and 3 - Requirement for a polyethylene enclosure and decontamination facility with three separate rooms, constructed in sequence, and a shower for workers leaving the work area. Section 2 is being varied to only include caution tape surrounding the work area at a distance of 15 feet and posting asbestos warning signs. This is equivalent as previous studies at MUMC have shown airborne fibre levels to be consistently below the Occupational Exposure Limit (OEL) for asbestos in the immediate vicinity of stand-alone

HVAC unit cleaning, and the difficulty of constructing an enclosure for this work in certain areas of the hospital without damaging the existing asbestos-containing sprayed fireproofing and further risking occupant and worker exposure to asbestos present in the work area. Section 3 shower requirements are being varied to only include a designated decontamination facility with no shower due to the low concentrations of asbestos present in airborne and surface dust during the work, and the difficulty of safely constructing and draining a shower in certain areas of the hospital.

- .2 Section 18(4) 5 and 6 - Requirement for a HEPA filtered exhaust ventilation system maintained by a competent worker, taking replacement air from outside the work area, and monitoring the negative pressure differential. Sections 5 and 6 will be varied to only include HEPA filtered vacuums which will be in use at all times in the immediate vicinity of the work. The negative pressure precaution is not considered necessary due to the low concentrations of asbestos present in airborne and surface dust during the work as shown during previous studies at MUMC. As indicated in the above variance, without an enclosure negative pressure within the work area is not feasible.
- .3 Section 18(4) 7 – Provides detailed requirements for the shower. Not required as per the reasons in item 1.3.1.1 above.
- .4 Section 18(4) 8 – Provides detailed requirements for worker decontamination. This will be modified to provide a designated worker decontamination area for removal of Personal Protective Equipment (PPE) and washing area.
- .5 Section 18(4) 15.1 – Negative air maintained during completion of the work. Not required as per Section 1.3.1.2.
- .6 Section 18(4) 16 – Air clearance sampling to occur once the work area is dry will be modified to accommodate the timing of the stand-alone HVAC unit shut-down. As the stand-alone HVAC units can only be shut-down for a 4 hour period the air clearance sampling will commence at the start of the work. The number of samples and minimum volume will still be followed for the air clearance sampling. In addition, one worker monitor sample will also be collected. The stand-alone HVAC units will remain off until verbal confirmation that the air clearance samples are below the 0.01 f/cc limit. Air sampling will only occur periodically (bi-annually or once for every 50 units cleaned whichever is greater) to ensure that these varied procedures provide equal protection to the workers. Air clearance sampling during stand-alone HVAC unit cleaning for construction projects will occur per project.

1.4 Instruction and Training

- .1 All workers and supervisory personnel performing work outlined in this varied procedure must submit the following prior to commencing with work:
 - .1 Proof in the form of a certificate that workers have been certified under the Ministry of Training, Colleges and Universities course 253W.
 - .2 Proof in the form of a certificate that supervisory personnel have been certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.

- .2 Provide instruction and training to all workers regarding the measures and procedures prescribed by this section; instruction and training must be provided by a competent person.

1.5 Personal Protection

- .1 Provide the following respiratory protection to all workers:
 - .1 Non-powered full-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
 - .3 Provide protective clothing to all workers, which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
 - .4 Is disposed of as ACM.
 - .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations and HHS policies.
 - .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.
 - .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, pre-clean all surfaces outside of the stand-alone HVAC Unit where possible without disturbing asbestos-containing materials using a HEPA vacuum or damp cloth.
- .2 Shut down the stand-alone HVAC unit to be serviced.
- .3 Upon Shut-down of the stand-alone HVAC unit, isolate the panel and disconnect the existing power supply to the Work Area. Power supply to remaining areas of the building are not to be disrupted during filter change work.
 - .1 Lock-out/tag-out power as per HHS policy.
- .4 Provide power from GFI equipped circuits in accordance with Occupational Health and Safety Act of Ontario and Regulations for Construction Projects to be used by equipment within the Asbestos Work Area.
- .5 As required, install temporary lighting in the Work Area that is consistent with the Occupational Health and Safety Act of Ontario.
- .6 Provide safe access to the work area by installing scaffold planks and plywood as necessary.
- .7 Install caution tape barrier to restrict access to only personnel performing the work; caution tape is to be at least 15 feet from all points of work.
- .8 Install signage in clearly visible locations, at all entrance points to the Work Area and in sufficient numbers to adequately warn unprotected workers of an asbestos dust hazard.
- .9 Establish a designated worker decontamination area. Indicate area with signs, and provide a designated route for workers to walk from the Work Area to decontamination area.
 - .1 Equip decontamination worker decontamination area with soap, water and towels.
- .10 Cover floors adjacent to and beneath the stand-alone HVAC unit to be serviced with polyethylene drop sheets before commencing with work. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers.
- .11 Install one layer of 6 mil polyethylene sheeting so as to protect all equipment in the Work Area that may be damaged or difficult to clean. Items to remain include but are not limited to:
 - .1 Electrical Equipment.
 - .2 Mechanical Equipment.
- .12 Post Ministry of Labour Notice of Project at the designated entrance to the work area.
- .13 Place required equipment and materials in the Work Area.
- .14 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .15 Do not use compressed air to clean or remove dust or debris.

2.2 Cleaning of Stand-alone HVAC Unit

- .1 If filters are being removed, then cleaning inside the stand-alone HVAC unit should only commence after filters have been removed. Where filters are to be removed, complete the following:
 - .1 Wet all stand-alone HVAC unit filters to be removed with amended water in order to control the spread of dust.
 - .2 Remove stand-alone HVAC unit filters, place directly into boxes formerly containing replacement filters to be installed in the stand-alone HVAC unit.
 - .3 Once the removed filters have been placed into boxes, seal the top flap of the boxes with tape.
 - .4 Dispose of removed filters sealed in boxes as clean waste.
- .2 Spray or mist surfaces to be cleaned with amended water using an airless sprayer or garden mister.
- .3 Once the areas have been wetted, apply a degreasing agent with an airless sprayer.
- .4 Upon application of a degreasing agent, surfaces may be scrubbed using hand held brushes and/or cloths; surfaces are to remain during the cleaning work.
 - .1 Apply additional amended water or degreasing agent may be applied to keep surfaces wet.
- .5 Upon completion of degreasing and cleaning work and once all surfaces have been adequately cleaned, rinse all surfaces within the stand-alone HVAC unit with water using either an airless sprayer, wet wiping or garden hose that is not equipped with a nozzle that increases pressure. Pressure washing methods are not to be used.
- .6 Following the rinsing of all surfaces, clean the inside of the stand-alone HVAC unit using a HEPA vacuum, cloths, etc.
- .7 Upon cleaning of stand-alone HVAC unit, install new filters prior to reactivating the unit.
- .8 Dispose of any used wipes, cloths, brushes, etc. as asbestos waste.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene sheeting, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene sheeting used for drops sheets, seals, etc. is not to be reused and is to be rolled-up and placed into asbestos waste containers.
- .3 Remove caution tape barrier, signage, scaffolding, plywood, temporary lighting (i.e. where used), etc.

2.4 Worker Clean-up

- .1 Before leaving the Work Area at the end of the work period all workers shall:
 - .1 Decontaminate protective clothing and respirator by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing personal protective equipment. If the protective clothing will not be reused, place it in an asbestos waste container.

- .2 Clean footwear by wet wiping.
- .2 Proceed to designated washroom or sink and wash hands and face.
- .3 Maintain respirator and replace filters as necessary.

2.5 Re-activation of Equipment

- .1 Upon completion of work, complete the following:
 - .1 Remove locks and tags from electrical panel and re-energize the stand-alone HVAC unit being serviced.
 - .2 Conduct a general cleaning of the Work Area using wet mop methods or by using a HEPA vacuum.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .2 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .3 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
 - .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .4 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .5 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .6 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.
- .7 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.

- .8 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .9 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .10 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
 - .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
 - .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
 - .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
 - .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

APPENDIX Z

Stand-alone HVAC Unit Filter Change Type 2 Varied Work Procedure

PART 1 GENERAL

1.1 General

- .1 The following Type 2 varied procedure is to be followed when changing filters in stand-alone Heating Ventilation and Air Condition (HVAC) Units at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario. This procedure is limited to the following types of stand-alone HVAC Units: Modines, Air Curtains, HV Units, HC Units and A/C Split Units. This procedure does not apply when changing filters inside the Air Handling Units (AHU's) located on Level 6.
- .2 The work is classified as a Type 2 operation under Section 12(3)10 of the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05). However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05.
- .3 The varied procedures include: specific worker training in the varied procedures, varied personal protection equipment, varied worker decontamination procedures, varied site isolation procedures and varied disposal requirements.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, by appointment.

1.3 Instruction and Training

- .1 Provide instruction and training to all workers, which should include the following:
 - .1 Hazards of asbestos.
 - .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that may be used and worn during work outlined in this varied procedure, including:
 - .1 Limitations of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Proper fitting of equipment.
 - .4 Disinfecting and cleaning of equipment.
 - .3 Personal hygiene to be worn when performing the work.

- .4 The measures and procedures prescribed by this section.
- .5 Instruction and training must be provided by a competent person.

1.4 Personal Protection

- .1 Asbestos Personal Protection Equipment (PPE) is not required, unless it is requested by the worker, where asbestos PPE is requested by the worker then the following should be provided:
 - .1 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Disposable protective clothing.
- .2 Where respiratory protection is requested by the worker, respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit tested by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Where protective clothing is requested by the worker, provide protective clothing which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable safety regulations and HHS policies.
- .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.
- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Prior to installing site protection, pre-clean all surfaces outside of the HVAC Unit where possible without disturbing asbestos-containing materials using a HEPA vacuum or damp cloth.
- .2 Shut down the stand-alone HVAC unit to be serviced.
- .3 Upon Shut-down of the stand-alone HVAC unit, isolate the panel and disconnect the existing power supply to the Work Area. Power supply to remaining areas of the building are not to be disrupted during filter change work.
 - .1 Lock-out/tag-out power as per HHS policy.
- .4 As required, install temporary lighting in the Work Area that is consistent with the Occupational Health and Safety Act of Ontario.
- .5 Provide safe access to the work area by installing scaffold planks and plywood as necessary.
- .6 Install caution tape barrier to restrict access to only personnel performing the work; caution tape is to be at least 15 feet from all points of work.
- .7 Install signage in clearly visible locations, at all entrance points to the Work Area and in sufficient numbers to adequately warn unprotected workers of an asbestos dust hazard.
- .8 Establish and install a designated worker and waste decontamination area within the Work Area.
 - .1 Equip decontamination worker decontamination area with soap, water and towels.
- .9 Cover floors adjacent to and beneath the stand-alone HVAC unit to be serviced with polyethylene drop sheets before commencing with filter change work. Drop sheets are to be installed in such a manner that they do not pose as a tripping hazard to the workers.
- .10 Place required equipment and materials in the Work Area.
- .11 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .12 Do not use compressed air to clean or remove dust or debris.

2.2 Stand-alone HVAC Unit Filter Changes

- .1 Wet all stand-alone HVAC filters to be removed with amended water in order to control the spread of dust.
- .2 Remove stand-alone HVAC filters, place directly into boxes formerly containing replacement filters to be installed in the stand-alone HVAC Unit.
- .3 Once the removed filters have been placed into boxes, seal the top flap of the boxes with tape.
- .4 Dispose of removed filters sealed in boxes as clean waste.

- .5 Install new filters prior to reactivating the unit.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, polyethylene sheeting and drop sheets used, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Polyethylene drop sheets and door flaps (i.e. where used) are not to be reused and are to be rolled-up and placed into asbestos waste containers.
- .3 Remove caution tape barrier, signage, scaffolding, plywood, temporary lighting (i.e. where used), etc.

2.4 Worker Clean-up

- .1 Proceed to designated washroom or sink and wash hands and face.
- .2 If protective clothing and respirator were worn, then the following shall apply:
 - .1 Protective clothing should not be reused and be placed in an asbestos waste container.
 - .2 Maintain respirator and replace filters as necessary, only where worn by the worker.

2.5 Re-activation of Equipment

- .1 Upon completion of work, complete the following:
 - .1 Remove locks and tags from electrical panel and re-energize the stand-alone HVAC unit being serviced.
 - .2 Conduct a general cleaning of the Work Area using wet mop methods or by using a HEPA vacuum.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.
- .2 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .3 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a clear 6 mil (0.15 mm) sealed polyethylene bag.
 - .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
 - .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.

- .4 HEPA Vacuum: High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .5 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified in sheet size to minimize joints. New materials only.
- .6 Protective Clothing: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .7 Rip-Proof Polyethylene Sheeting: Minimum requirements 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and 2 layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps. New materials only.
- .8 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .9 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 Work Area Signs: Post signs in both official languages at access points to the Asbestos Work Area as follows:
 - .1 CAUTION.
 - .2 Asbestos Dust Hazard Area.
 - .3 Unauthorized Entry Prohibited.
 - .4 Wear Assigned Protective Equipment.
 - .5 Breathing Asbestos Dust May Cause Serious Bodily Harm.
 - .6 Supplement with HHS approved signage.

3.3 Waste and Material Handling

- .1 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.
- .2 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of the Environment.

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:

- .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
- .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
- .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended.

END OF VARIED PROCEDURE

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HAMILTONHEALT,MUMC,AMPUdate,ASB,CONS\Deliverables\DRAFT\MUMC\2\Part B Appendices\217420.028 Appendix AA Type 2 HVAC Unit Filter
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APPENDIX AA

Powder Actuated Nail Fastener Type 2 Varied Work Procedure

PART 1 GENERAL

1.1 General

- .1 The following Type 2 varied procedure is to be followed when using a powder actuated nail fastener to install metal wall bases to concrete slabs where asbestos-containing mastic has been scraped to a thin stain-like film at McMaster University Medical Centre (MUMC) located at 1200 Main Street West, Hamilton, Ontario.
- .2 It is Pinchin's opinion that this type of work is classified as a Type 2 operation in the Ontario Asbestos Regulation 278/05 (O.Reg. 278/05), an operation that may expose a worker to asbestos and is not classified as a Type 1, 2 or 3 operation, as per Section 12(3)11 of O.Reg. 278/05. However, in order to determine appropriate procedures; testing has been performed by Hamilton Health Sciences (HHS), which indicates that the varied measures and procedures provide equivalent protection for the workers, as required by Section 23 of O.Reg. 278/05. Testing included; personal, area and reference air sampling during the fastening work of bases to the concrete slab where asbestos-containing mastic is present within the test location.
- .3 The varied procedures include: specific worker training in the varied procedures, varied personal protection equipment, varied worker decontamination procedures and varied site isolation procedures.
- .4 This varied procedure has been prepared solely for HHS and may be distributed to contractors properly trained and qualified to perform asbestos work that they retain to perform the work outlined in this Section.
- .5 Provide a copy of this procedure to the Joint Health and Safety Committee for the workplace prior to implementing the procedures.
- .6 All work outlined in this varied procedure is to be completed in accordance with the requirements outlined in the HHS Infection Prevention Control Guidelines.

1.2 Site Conditions

- .1 Refer to the most recent Asbestos-containing Materials Reassessment Report for the facility. This document can be reviewed with the HHS Hazardous Materials Specialist, Project Designate or Facilities Management, by appointment.
- .2 Black mastic, containing chrysotile asbestos, is present throughout the building.

1.3 Instruction and Training

- .1 Provide instruction and training to all workers, which should include the following:
 - .1 Hazards of asbestos.
 - .2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that may be used and worn during work outlined in this varied procedure, including:
 - .1 Limitations of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Proper fitting of equipment.

- .4 Disinfecting and cleaning of equipment.
- .3 Personal hygiene to be observed when performing the work.
- .4 The measures and procedures prescribed by this section.
- .5 Instruction and training must be provided by a competent person.

1.4 Personal Protection

- .1 Asbestos Personal Protection Equipment (PPE) is not required, unless it is requested by the worker, where asbestos PPE is requested by the worker then the following should be provided:
 - .1 Non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters.
 - .2 Disposable protective clothing.
- .2 Where respiratory protection is requested by the worker, respirators shall be:
 - .1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Asbestos Work Area has facial hair which affects the seal between respirator and face.
 - .3 Assigned to a worker for their exclusive use.
 - .4 Maintained in accordance with manufacturer's specifications.
 - .5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
 - .6 Repaired or have damaged or deteriorated parts replaced.
 - .7 Stored in a clean and sanitary location.
 - .8 Provided with new filters as necessary, according to manufacturer's instructions.
 - .9 Worn by personnel who have been fit tested by qualitative or quantitative fit-testing. Instruction must be provided by a competent person as defined by the Occupational Health and Safety Act.
- .3 Where protective clothing is requested by the worker, provide protective clothing which:
 - .1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres.
 - .2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
 - .3 Is replaced or repaired if torn or ripped.
- .4 Wear hard hats, safety shoes and other personal protective equipment required by applicable safety regulations and HHS policies.
- .5 Provide soap, towels and facilities for washing of hands and face following the completion of work.
- .6 Prohibit smoking, eating, drinking, chewing in the Asbestos Work Area.

PART 2 EXECUTION

2.1 Site Preparation and General Procedures

- .1 Install caution tape barrier to restrict access to only personnel performing the work. Post HHS varied work procedure warning signs at caution tape barrier.
- .2 Place required equipment and materials in the Work Area.
- .3 HVAC system servicing the Work Area may remain operational.
- .4 Maintain Work Area in tidy condition. Do not track dirt or dust to adjacent areas outside of the Work Area.
- .5 Do not use compressed air to clean or remove dust or debris.

2.2 Procedure

- .1 Ensure that asbestos-containing vinyl floor tiles within the work area have been removed and disposed of and black mastic has been scraped to a thin stain-like film following Type 1 procedures prior to completing any of the work outlined below.
- .2 Wet all areas of the floor to be affected by the work with amended water in order to control the spread of dust.
- .3 Proceed with using a powder actuated nail fastener to install metal wall bases to the concrete slab where the asbestos-containing vinyl floor tiles were removed and the black mastic has been scraped to a stain-like film.
- .4 Upon completion of work, clean the top of the metal wall bases that were installed using a HEPA vacuum or wet wipe methods.

2.3 Clean-up and Dismantling

- .1 Clean Work Area, equipment, tools, etc. using a HEPA vacuum or wet wiping methods.
- .2 Remove caution tape barrier and HHS varied work procedure warning signs.

2.4 Worker Clean-up

- .1 Proceed to designated washroom or sink and wash hands and face.
- .2 If protective clothing and respirator were worn, then the following shall apply:
 - .1 Protective clothing should not be reused and be placed in an asbestos waste container.
 - .2 Maintain respirator and replace filters as necessary, only where worn by the worker.

PART 3 PRODUCTS AND FACILITIES

3.1 Materials and Equipment

- .1 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
- .2 Asbestos Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment comprised of one of the following:
 - .1 A 6 mil (0.15 mm) labelled yellow sealed polyethylene bag, inside a second clear 6 mil (0.15 mm) sealed polyethylene bag.

- .2 A 6 mil (0.15 mm) sealed polyethylene bag, positioned inside or outside a rigid sealed container of sufficient strength to prevent perforation of the container during filling, transportation and disposal.
- .3 Labelled containers as required by the Ontario Ministry of the Environment Reg. 347 as amended and Regulation 278/05.
- .3 **HEPA Vacuum:** High Efficiency Particulate Arresting (HEPA) filtered vacuum equipment with a filter system capable of collecting and retaining spherical particles greater than 0.3 microns at 99.97% efficiency.
- .4 **Protective Clothing:** Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres. Coveralls to fit snugly at ankles, wrists and neck. Acceptable materials: Dupont Tyvek or Kimberly Clark Kleenguard.
- .5 **Sprayer:** Garden type portable manual sprayer or water hose with spray attachment if suitable.
- .6 **Tape:** Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

3.2 Signage

- .1 HHS Varied Work Procedure Warning Signs: Post signs in both official languages at access points to the Work Areas. Refer to attached signage at the end of this document for reference.

3.3 Waste and Material Handling

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

PART 4 APPLICABLE REGULATIONS

4.1 Regulations

- .1 Comply with Federal, provincial, and local requirements, provided that in any case of conflict among those requirements or with this varied procedure the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed. Regulations include but are not limited to the following:
 - .2 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.
 - .3 Ministry of Transportation Regulations for the transport of asbestos waste, including the Transportation of Dangerous Goods Act.
 - .4 Ministry of the Environment Regulations for the disposal of asbestos waste, including R.R.O. 1990, Reg. 347 as amended

END OF VARIED PROCEDURE

APPENDIX BB
Interstitial Space Pre & Post Inspection Sign-off Form



Interstitial Space Pre & Post-inspection Sign-Off Form

Project: _____

Location: Floor _____ Area _____

Contractor: Company Name: _____ Representative: _____

Phone # _____ Emergency # _____

Description of activity: (Specify activity and shafts to be used for entry): _____

PRE-INSPECTION REVIEW

Inspection Date: _____

Report Attached: YES / NO

Participating Reps.	Name	Signature
Hazardous Materials Specialist		
Capital Project Designate		
General Contractor Designate		

Deficiency remediation by: _____

Deficiencies Completed: Date: _____ **Checked:** Date: _____

Contractor Inspection completed by: _____ Date: _____

Further deficiencies corrected (if required): Date: _____

POST-INSPECTION REVIEW

Inspection Date: _____

Report Attached: YES / NO

Participating Reps.	Name	Signature
Hazardous Materials Specialist		
Capital Project Designate		
General Contractor Designate		
JHSC Representative		

NOTE: Unless work is to be completed below the decking in this area, NO decking need to be lifted.

Deficiency remediation by: _____

Deficiencies Completed: Date: _____ **Checked:** Date: _____

Contractor Inspection completed by: _____ Date: _____

Further deficiencies corrected (if required): Date: _____

APPENDIX CC
Asbestos Abatement Inspection Form



LOCATION OF ASBESTOS ABATEMENT

Hospital: _____ Location: _____
 Project : _____ Abatement Company: _____
 Project Manager: _____ Contact Information: _____

ASBESTOS ABATEMENT DETAILS: (List materials, quantity and other details): _____

Action: Cleaning Repair Encapsulation Removal → Type 1 Type 2 Type 2 glove bag Type 3
 Type of Asbestos: Chrysotile Other than Chrysotile : _____
 Contractor PPE: None 1/2 Face APR Full Face APR PAPR Supplied Air Coveralls Other
 Was asbestos material replaced? Yes No → If Yes with what: _____
 Has MOL notice of project been posted at Site? Yes No Notice of Project No. _____
 Is the Project a Varied Type 3? Yes No Was a copy of the variance submitted to JHSC Yes No

WORK SITE ENCLOSURE INSPECTION GENERAL CHECKLIST

Pre-Removal	DATE (d/m/y):	Time: a.m. <input type="checkbox"/> p.m. <input type="checkbox"/>	Type 1	Type 2	Type 3
Have washing facilities for hands and face been provided?					
Have appropriate drop sheet(s) and/or enclosure(s) been used/constructed?					
Has visible dust been cleaned from work area before start or work?					
Have all items been removed from work area or been covered with sheeting?					
Has signage been posted warning of asbestos hazard and restricting access?			/		
Have windows been constructed in the enclosure? (opaque enclosures only)			/		
Has mechanical ventilation been disabled and sealed?			/		
Has worker decon been constructed (clean & dirty change rooms, shower)?			/	/	
Has negative pressure been applied to enclosure & exhausted through HEPA?			/	/	
Has a device for monitoring pressure differential been installed & monitored?			/	/	
Has a min of 0.02 In W.C. (5 Pascals) been achieved in the enclosure?			/	/	
Pressure Differential (In W.C. <input type="checkbox"/> Pa <input type="checkbox"/>)					
Active/Post Removal	DATE (d/m/y):	Time: a.m. <input type="checkbox"/> p.m. <input type="checkbox"/>	Type 1	Type 2	Type 3
Are appropriate drop sheet(s) and/or enclosure(s) being used/constructed?					
Has ACM been wetted using water and a wetting agent?					
Have appropriate waste containers been used (dust tight, proper labelling)?					
Has work area been thoroughly cleaned of all asbestos waste, debris and dust?					
Is waste and equipment leaving work area being cleaned (HEPA, damp wipe)?			/		
Was "Lock Down" or sealant applied after final clean-up?			/		
Has a min of 0.02 In W.C. (5 Pascals) been maintained in the enclosure?			/	/	
Pressure Differential (In W.C. <input type="checkbox"/> Pa <input type="checkbox"/>)					

Was Air Monitoring/Clearance Air Testing performed? Yes No
 Was Forced Air used and Negative Air Pressure maintained during Air Clearance sampling? Yes No
 Did the Air Clearance Testing Pass? Yes No
 Was a member of the JHSC present during Sampling? Name: _____

Notes: _____

Inspector(s): _____