

MSB 5318- Lab Refresh

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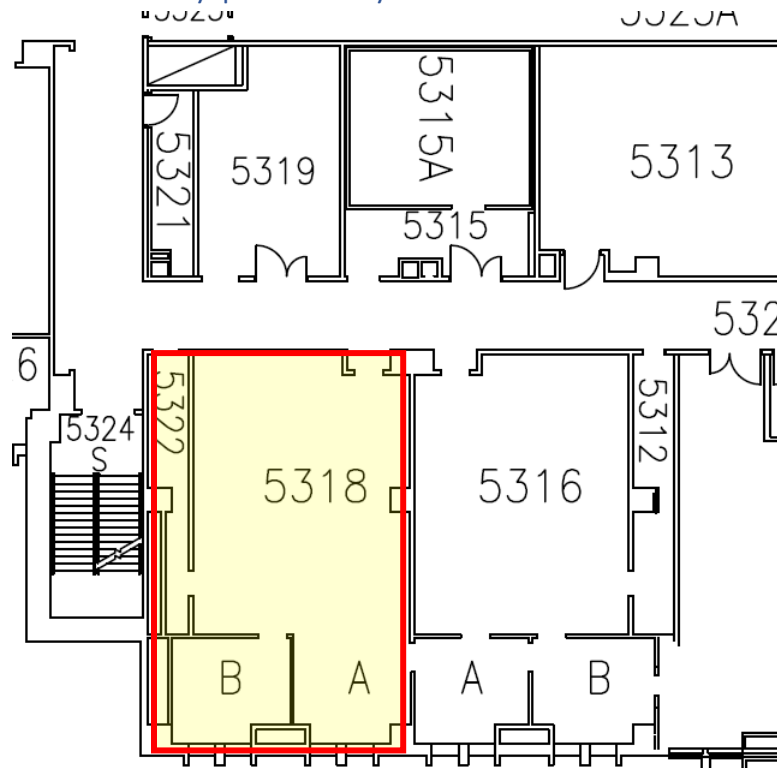
1. PROJECT

1.1. Introduction

This document provides details about contractor's scope for renovations to MSB Lab 5318 to meet CL2 standards.

Existing millwork, millwork benches, sinks, cabinets, raceways and flooring to be removed. New handwash sink and eyewash to be supplied and installed. A new knee wall with access panel to be constructed for the water and drainage lines for sinks. Connections for the lab benches including a gas shutoff will be installed. New coved rubber flooring to be installed. Space to be painted. New lab benches pegboards, shelves, cabinets and sinks will be procured by the owner, GC to receive the delivery and install.

1.2. Key plan & layout



2. MILESTONE SCHEDULE

This RFP and subsequent work will proceed according to the following milestone schedule. The University reserves the right to modify any or all dates at its sole discretion and at any time.

| Milestone | Tentative end date |
|---|----------------------------------|
| | |
| | |
| | |
| Construction | 2026-02-27 |
| Commissioning & Handover (Substantial completion) | 2026-03-13 |
| Closeout | After completion of deficiencies |

2.1 Payment Milestones

One payment with holdback upon substantial completion. Holdback until project closeout. No progress draws.

3. GENERAL NOTES

1. Review all existing site conditions before starting work and advise Facilities Planner of any discrepancies.
2. Carry out all demolition work in a manner as necessary to accommodate construction of new work as shown in construction documents.
3. Ensure that dust is minimized on-site and is contained within the demolition area.
4. General contractor is responsible for safe and legal disposal of all demolished and unwanted material from the project area. All fees levied relating to waste disposal to be paid by the Contractor.
5. Remove and dispose of all construction waste. General Contractor is responsible for the safe and legal disposal of all waste materials. All fees levied relating to waste disposal to be paid by the Contractor.
6. If the Contractor finds any potential biohazard waste left behind on site, notify the University's Environmental Protection Service (416-946-3473) immediately for safe removal of items.
7. Where removing floor / walls / ceiling finishes, ensure that adjoining finishes and systems to remain are not damaged.
8. Provide transition strip as specified at all locations where new flooring meets existing flooring. Ensure the proper functioning of the doors after the transition strip install.
9. Noisy work to commence after or before building operating hours (weekdays 8:00am – 6:00pm) only. General Contractor to inform/verify with Facilities Planner time of work. Noisy work includes use of pneumatic tools, demolition and similar.
10. At end of each workday, leave site in a safe and tidy condition. Do not make unstable any part of the structure.
11. Check and verify floor level prior to constructing any partitions, millwork or new floor finishes. Provide skim coat.
12. Comply with the latest requirements of CSA, ULC, the applicable federal, provincial and municipal codes and the current electrical safety code.
13. "Paint rooms" indicates – "Patch, prep and paint walls of all rooms, including interior side of doors and door frames. Remove all wall protrusions (i.e. hooks, nails, brackets, shelving, etc.) and fill voids as part of preparation work.
14. Paint all wire molds. Refer to section 5.2 for paint type and colour.
15. All paints, primers, sealants, adhesives used for the Work must be low-VOC as per University standards.
16. All new eyewashes installed as part of the Work shall be tested and commissioned as part of the Contractor's scope to ensure proper working condition. Sign tag on unit to note date of testing. Provide written confirmation to Facilities Planner and Property Manager that all units have been tested and installed as per AINSI standards.
17. Test all existing emergency showers post-construction to ensure they are in proper working condition with required water pressure. Sign tag on unit to note date of testing. Provide written confirmation to Facilities Planner and Property Manager that all units have been tested.
18. Laboratory Service Fittings to be identified with colour coded plastic removable index buttons with engraved lettering filled with enamel corresponding to the following standards:

| Service | Lettering | Colour |
|----------------|-----------|--------|
| Hot Water | HW | Red |
| Cold Water | CW | Green |
| RO Water | RO | White |
| Compressed Air | AIR | Blue |
| Natural Gas | GAS | Orange |

19. When working in a space connected to an adjacent room not part of the Project Scope, tightly seal wall opening with heavy-duty plastic drop sheet or tarp to prevent any dust and/or odour from escaping and entering adjacent rooms.
20. If access is required through an occupied space to get to the Work, contact the Facilities Planner immediately and arrange for access. Contractor to schedule work in spaces connected to adjacent occupied rooms for after hours (weekdays 6pm to 8am) and/or weekends.
21. Notify the Property Manager of any shutdowns required prior to start of work. Follow all University shut down procedures and protocols.
22. Notify the Property Manager prior to accessing/modifying BAS components. Follow the document downloadable here:
https://www.fs.utoronto.ca/wpcontent/uploads/forms/12_BAS_and_EMRS_Access_Process.pdf
 Please contact Property Manager or Facilities Planner in case the document is not accessible.
23. Where obsolete plumbing/gas/air services are indicated for removal, cut and cap in shaft, at floor or at wall, where applicable. Where cutting and capping at wall or floor, make sure work it is flush with wall/floor surface. Seal any openings generated by the cut/cap with appropriate sealant, as specified in section 5.
24. Requirements mentioned in appendices shall be a part of this scope. However, if any discrepancies exist between the requirements in the document, the order of precedence shall be as follows:
 - Minutes of meeting (post award)
 - Addenda
 - Scope
 - Architectural drawings
 Contractor shall highlight and seek resolution to any discrepancies observed between the scope and appendices before procurement and execution.
- 25. In addition to the scope of work, the architectural, electrical and mechanical drawings, where applicable, refer to and follow:**
***Scope of Work – Designated Substances Abatement/Procedures (Appendix-2)**
26. Note about permits: Contractor is responsible for any documentation and permits necessary to carry out related work, where applicable. Contractor to facilitate all communication with Building inspector.
27. Contractor to submit construction schedule within 2 weeks of award of contract.

4. SEALANT REQUIREMENTS

The following applies to all spaces within the Project Scope. Sealant required to meet CL2 standards:

1. Silicone seal at top of floor base cap where it meets the wall.
2. Silicone seal around all door frames where floor & wall meet frame.
3. Seal gaps behind any wall mounted conduits.
4. Seal gaps around any integral wall mounted artifacts.
5. Fill any holes in walls, around pipe and conduit penetrations in walls and/or ceilings with clear, paintable silicone. Any holes shall be plugged and/or patched to accept new paint finish.
6. Silicone seal around all static elements of door handles.
7. Silicone seal around bench legs of fixed furniture, where they meet the floor, where applicable.
8. Silicone seal around all existing drop-in sinks and adjacent faucets and fixtures (i.e. eyewash units).
9. Seal edges of all wooden shelves, where applicable.
10. Line any wall pass through openings with a non-porous sheet material and seal accordingly at edges, where the liner meets the wall.
11. All junctions between benches, fume hoods, sinks and walls to be sealed.
12. Junction of the wall and the benchtop backsplash needs to be sealed.

5. GENERAL SPECIFICATIONS

5.1 Floor Finishes

Seamless flooring to be Noraplan Envirocare 3.0 mm sheet resilient floor covering, or approved equivalent,

Colour: 7038 (Hide-n-seek), unless otherwise specified.

Flooring to be installed with integral cove base. Details to be as per manufacturer's specifications.

Transition strip (if required) by ROPPE or equivalent in black colour to be used.

Resilient Rubber Sheet flooring will include the following work:

- i. Removal of existing epoxy paint on the flooring if encountered.
- ii. Preparation of substrate (Skim Coat) and installing leveling compound.
- iii. Moisture reducing barrier coating.
- iv. Resilient rubber sheet flooring.
- v. Integral resilient (cove) base. Use manufacture approved edge profile.
- vi. Metal reducing strips and thresholds at junction with adjacent architectural finishes.

5.2 Paint, Sealant and Wall finishes

A. Paint

Door and frame paint to be Benjamin Moore Ecospec, or approved equivalent,

Colour: 2119-20, "Black Berry"

Finish: Semi-Gloss

Wall & ceiling paint to be Benjamin Moore Ecospec, or approved equivalent,

Colour: OC-130, "Cloud White", unless otherwise specified.

Finish: Semi-Gloss

Note:

- Fill any holes in floors and walls, with clear, paintable silicone where not exceeding 1" in diameter.
- Fill any holes in floors and walls with a cement-based repair product, where exceeding 1" in diameter.

B. Sealant

Sealant colour to be chosen by Facilities planner from full range of colours. Sealants to be applied as indicated in drawings and project scope. Ensure appropriate sealant type is used for application and that joint sizes are appropriate for sealant.

| Application | Sealant Description | Acceptable Products |
|---|---|--|
| Perimeter of hollow metal door frames Interior of hollow metal screens frames Cove base adjacent wall surface | Single-component neutral-curing silicone sealant or single/multi component polyurethane sealant | <ul style="list-style-type: none"> • Dow Corning 791 or 795 or Dow Corning CWS • Spectrem 2 or Spectrem 3 or Tremsil 600 or Dymonic or Dymonic FC or Dymonic 100 by Tremco Canada • Sanitary SCS1700 by Momentive Materials • SikaSil –GP by Sika Canada |
| Lab sinks & countertop Splashguards and countertops/ shelves Countertops & wall Wiremold & wall | Mildew resistant, single-component non-sag, acid curing silicone joint sealant | <ul style="list-style-type: none"> • Dow Corning 786 or or DC Tube Tile Ceramic by Dow Corning • Tremsil 200 by Tremco Canada • Silpruf SCS2900 by Momentive Materials • SikaSil WS-295 by Sika Canada |

5.3 Ceiling finishes

Match existing tiles wherever applicable.

5.4 Plumbing fixtures

Contractor to highlight any compatibility conflicts between sink, faucets and eyewash. Contractor to provide all other unspecified services and fittings for proper functioning of fixtures as a part of base bid. This shall include repairing existing plumbing infrastructure.

- Utility sink

One 8" deck mount mixing laboratory faucet with gooseneck and blade handles. With built-in back flow preventer. Contractor to check the base-mount /splash-mount compatibility prior to ordering. Please contact the facilities planner in case of any discrepancy.

One faucet for DI water.

Pedal operators for all faucets.

- Hand-wash sink

Hand wash sink to be American Standard Lucerne Wall-hung Lavatory Vitreous China sink. Nominal dimensions: 20.5" x 18.25", Bowl size 15"W 10"FB 6.5"D, Colour: White, Single faucet-hole or approved equivalent. Please contact the facilities planner in case of any discrepancy.

Zurn Z6922-XL faucet with 8" gooseneck, p6900-MV-ZL mixing valve, 1.0gpm laminar flow aerator, Zurn p6000-HW6 hardwired power converter or equivalent. Contractor to check the base-mount /splash-mount compatibility prior to ordering. Please contact the facilities planner in case of any discrepancy.

- Eyewash

Wall mounted eyewash with drench hose & mixing valve to be Guardian, Model G5026 with mixing valve TMV G3600LF to deliver tepid water

- Backflow preventors

Appropriate backflow preventers to be supplied and installed on all faucets including any fume hood faucets.

5.5 Accessories

Wall mounted coat hooks (CH) to be Bobrick B-542, or approved equivalent
Colour: White

Soap Dispenser (SD) to be Vertical Surface Mounted Soap Dispenser 40 Oz. Must accept bulk liquid soap.
Finish: Plastic

Paper Towel Dispenser (PTD) to be Bobrick B-4262 Contura Series Surface Mounted Towel Dispenser, or approved equivalent
Finish: Stainless Steel

Blinds: ProWeave S

Finish: Colour – Platinum, Openness – 3%. Material to be wipeable, cleanable, chemical resistant and bleachable. GC to provide a sample for approval before procurement. GC to take site measurements to ensure correct size.

5.6 Electrical

Ceiling light (L2)

2'W X 2'W, Recessed light fixture suitable for T-bar mounting with 2600 lumen output, 25V 3500K white finish and c/w 120V (0-10V) dimming driver. Compatible with T8 type B tubes. GC to provide shop drawings for approval.

Dimmer Switch

wall mounted (0-10V) 1 button dimming switch. Finish colour shall be white. Compatible with installed lights

Occupancy sensors

To be compatible with installed lights. Numbers and locations to be decided as per site layout. Sensors to be installed manual bypass option.

5.7 Doors

This section is left blank intentionally.

6. WARRANTIES

General Contractor to submit all warranty information and documents for all products and materials to Owner.

- 1) All elements under Flooring
 - Provide manufacturer's warranty on product and installation integrity
 - Provide manufacturer's warranty on product (sheet vinyl and weldrods) and installation integrity
 - Warrant work/materials for a period of 2 years against defects and/or deficiencies. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Facilities Planner and Property Manager, at no expense to Owner.
 - General Contractor to provide 5-year installation warranty on weldrod seams and transition strip seams to warrant installers' workmanship.
- 2) All elements Mechanical
 - Warrant work/materials for a period of 1 year against defects and/or deficiencies. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Facilities Planner and Property Manager, at no expense to Owner.

7. SUBMITTALS

6.1 Samples & Product Data Sheets

1. Circle or note on data or catalogue sheets which list optional dimensions, model number and accessories, the specific options to be supplied.
2. Submit for review samples in duplicate as requested per the list below.
3. Label samples as to origin and intended use in the work and deliver prepaid to the Facilities Planner.
4. Adjustments made on samples by the Facilities Planner are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Facilities Planner prior to proceeding with the Work.
5. Submit with samples of site and shop applied coatings, the type, thickness and classification, generic material, manufacturer's trade name and code number and code number for colour for each layer. Submit total coating thickness.
6. Submit test reports with samples, prepared by an independent testing authority acceptable to the Facilities Planner as specified or requested by the Facilities Planner.

Submit samples and product data sheets for the following:

- Seamless flooring
- Weldrod for seamless flooring
- Transition strip for seamless flooring
- Replacement Vinyl Tile Flooring
- Wall, ceiling, door paints – submit MSDS and two 300 x 150mm draw downs for each colour; identify each sample with Contract number and title, colour reference, sheen, date, and name of applicator
- Silicone sealant – submit MSDS

6.2 Shop Drawings

1. Prepare shop drawings using visible scales and dimensions.
2. Show on shop drawings complete details of items to be provided and their interface with other components of the Work. Clearly note dimensions and methods of fastening.
3. Include Product data, manufacturers' specifications, certification of compliance to standards and installation instructions as specified in respective specification sections
 4. Do not construct, fabricate or deliver parts of the Work requiring shop drawings prior to receiving shop drawings stamped "REVIEWED" or "REVIEWED AS NOTED" by the Facilities Planner
5. Noted comments made on shop drawings by the Facilities Planner are not authorization for changes to the Contract Price. If comments affect the value of Work, state such in writing to the Facilities Planner prior to proceeding with the Work.
6. Indicate Products, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the Specification section

under which the adjacent items will be supplied and installed. Indicate cross references to the Drawings and Specifications.

7. Make changes in shop drawings as the Facilities Planner may require, consistent with Contract Documents. When resubmitting, notify the Facilities Planner in writing of any revisions other than those requested.

Submit shop drawings for the following:

- Eyewash/drench hose unit
- Mixing valve
- Sink
- Faucets
- Lights, switches and occupancy sensors.
- Ceiling
- Blinds
- Signage
- Doors (Clearly indicate all dimensions of door and vision glazing, where applicable)

6.3 As built / record drawings

1. Prepare as built drawings using visible, standard scales and dimensions.
2. Show on as built drawings complete details of items to be provided and their interface with other components of the Work. Clearly note exact dimensions and methods of fastening.
3. Prepare all work as-built drawings on sheets measuring 11 inches by 17 inches, unless otherwise indicated.
4. Provide each drawing with a title block and label accordingly.
5. Submit all shop drawings with the close out documents, to formalize close out process. Failure to provide these documents will result in project being deemed incomplete.

6.4 Certificates & reports

1. Provide written confirmation to Facilities Planner and Property Manager that all eyewash units have been installed as per ANSI standards and tested accordingly.
2. Arrange for ESA permit and inspection of the work. On completion of the work, present to the Property Manager and Facilities Planner the final certificates of approval.

8. BASE WORK ITEMS

This section is to be read in conjunction with Appendix-1 and Appendix-2 (DSSR).

A. Architectural.

Demolition

All rooms

- 8.1 Remove & dispose off millwork benches, existing uppers, counter, cabinets and all related mechanical infrastructure (plumbing & electrical) in its entirety, where indicated in Appendix-1 . Cut, cap and make good all wall and floor penetrations flush with the floor/wall. All existing life safety devices to be retained.
- 8.2 Remove ALL existing floor coverings (including any other layer of flooring if found below existing flooring). Remove & dispose of ALL existing base boards. Floor mastic removal to be done by machine grinding complete to concrete floor.
- 8.3 Necessary demolition for relocating electrical/data outlets.

Construction

All rooms

- 8.4 Supply and install new resilient rubber sheet flooring with integral cove base as specified in section 5 as per manufacturer's guidelines.
- 8.5 Patch and paint all room walls as specified in 5.2, A Paint and Wall Finishes. Ensure all holes are sealed prior to painting.
- 8.6 Fill large wall openings from old lab bench plumbing with masonry. Remove any installed metal plate for utility openings.
- 8.7 Patch and paint all ceilings and Wall Finishes. Replace up to 15 damaged ceiling tiles.
- 8.8 Replace all light lenses.
- 8.9 Construct knee wall using 5/8" type x gypsum wall board to reroute plumbing, drainage and electrical for utility and handwash sink with SS splash guards and access panels. Mud and paint along with the rest of the lab,
- 8.10 Repaint fume hood, match existing finish.
- 8.11 Supply and install new ½" thick, 2' tall Plexiglas splash guard on bench near handwash sink with rounded exposed corners.
- 8.12 Supply and install new paper towel dispensers at every sink.
- 8.13 Supply and install a soap dispenser at every sink in every room.
- 8.14 Supply and install coat hooks; numbers and location shown in Appendix-1

B. Mechanical

Demolition

Any damages to the retained existing plumbing infrastructure to be rectified at no additional cost to owner.

All rooms

- 8.15 Remove and dispose of existing sinks and all related mechanical infrastructure (plumbing & electrical) in its entirety. Cut, cap and make good all wall and floor penetrations flush with the floor/wall. Reroute where necessary.

Construction

All rooms

- 8.16 Reroute / install plumbing and drainage for installation of new utility sink, handwash sink and eyewash.
- 8.17 Install new utility sink (owner provided) with supply and install of with faucets and accessories.
- 8.18 Supply and install new hand-wash sink complete with faucets and accessories. Refer to section 5.4 for specifications.
- 8.19 Supply and install new eyewash station with mixing valve near existing hand wash sink. Refer to section 5.4 for specifications.
- 8.20 Provide utility connection outlets on the shaft wall by rerouting lines in the shaft.
- 8.21 Supply and install shut off valves for air and gas main line to the lab.

C. Electrical

All rooms

- 8.22 Remove electrical outlets in the existing benches as a part of demolition of benches so that new benches can be installed, and outlets can be connected to them.
- 8.23 Remove old raceways as shown in Appendix-1
- 8.24 Remove and dispose old Bell communication outlets, cap and close with blank plate at wall.

Construction

All rooms

- 8.25 Test all retained electrical and ethernet outlets and ensure that they are operational.
- 8.26 Reinstall any non-functioning / damaged electrical outlets.
- 8.27 Repair/ replace any damaged wire mold and raceways.
- 8.28 Hardwire power converter for hands free faucet.
- 8.29 Install new power and data outlets including wire mold or raceways.
- 8.30 Make connections to outlets on new owner supplied benches. Sourcing additional power (if required) to accommodate new connections to be a part of the base bid.
- 8.31 Install new data lines as shown in Appendix-1

D. Miscellaneous

All rooms

- 8.32 Receive delivery and move to Install benches, utility sink, shelves, and cabinets supplied by owner. Coordinate with Facilities Planner
- 8.33 Attend site visits with EHS to review and complete any deficiencies. Refer to section 4 for sealant requirements.

9. SEPARATE PRICE ITEMS

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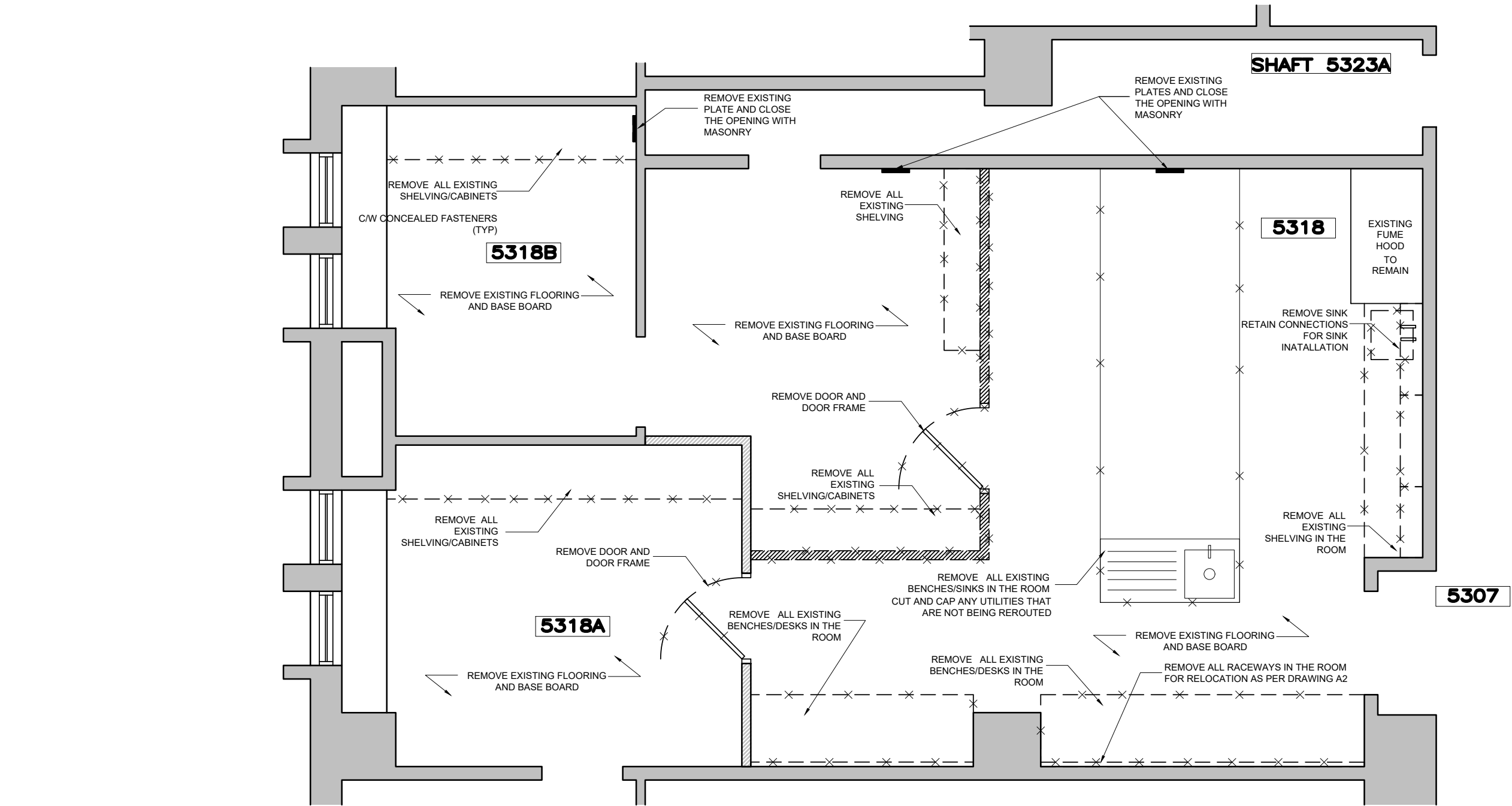
10. ALTERNATE PRICE ITEMS

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LIST OF APPENDICES

| | |
|------------|--|
| Appendix-1 | Scope drawings |
| Appendix-2 | Designated Substances Abatement/Procedures |

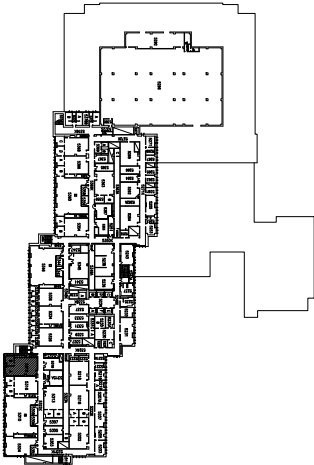
APPENDIX - 1



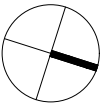
- * NOTES:
- RETAIN ELECTRICAL INFRASTRUCTURE FOR RECONNECTION DURING CONSTRUCTION.
 - RELOCATE ANY EMERGENCY POWER OUTLET IF ENCOUNTERED.
 - RETAIN ALL EXISTING ELECTRICAL AND DATA/ETHERNET OUTLETS UNLESS NOTED OTHERWISE.
 - READ THIS DRAWING IN CONJUNCTION WITH THE SCOPE DOCUMENT AND DSSR
 - FOLLOW F&S GUIDELINES
 - CONTACT FACILITIES PLANNER IN CASE THERE ARE ANY QUERIES ABOUT SCOPE.
 - THIS DOCUMENT COVERS ELEMENTS OF ARCHITECTURAL, ELECTRICAL AND MECHANICAL SCOPE
 - TEST ALL RETAINED ETHERNET AND ELECTRICAL OUTLETS AND ENSURE THAT THEY ARE OPERATIONAL.
 - REPAIR ANY DAMAGED WIREMOLD.

NOTES

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27-AUG 2025 ISSUED FOR CONSTRUCTION



Drawing Title.
DEMOLITION FLOOR PLAN

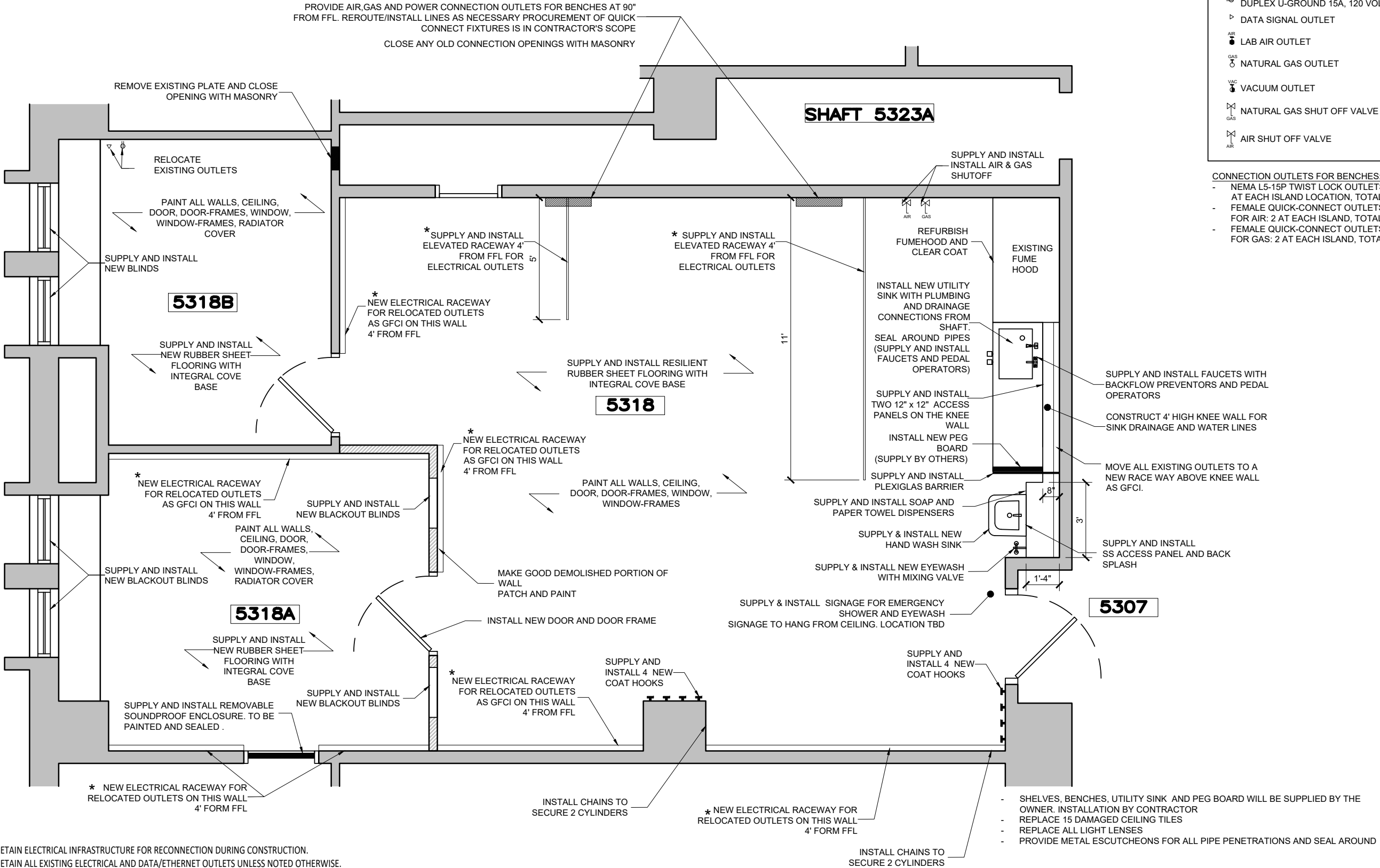
Sheet no.
A1

University of Toronto

Office of Facilities Management &
Space Planning

Project
MSB 5318 : LAB REFRESH

TEMERTY FACULTY OF MEDICINE
Building 1 KING'S COLLEGE CIRCLE
Scale NTS
Date 31-JUL-2025
Print Format 11X17

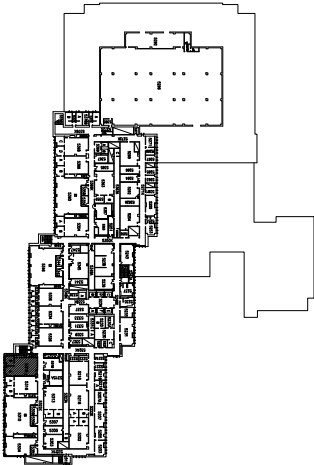


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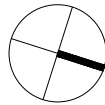
- RETAIN ELECTRICAL INFRASTRUCTURE FOR RECONNECTION DURING CONSTRUCTION.
- RETAIN ALL EXISTING ELECTRICAL AND DATA/ETHERNET OUTLETS UNLESS NOTED OTHERWISE.
- READ THIS DRAWING IN CONJUNCTION WITH THE SCOPE DOCUMENT AND DSSR
- FOLLOW F&S GUIDELINES
- CONTACT FACILITIES PLANNER IN CASE THERE ARE ANY QUERIES ABOUT SCOPE.
- THIS DOCUMENT COVERS ELEMENTS OF ARCHITECTURAL, ELECTRICAL AND MECHANICAL SCOPE
- ALL EXISTING EMERGENCY POWER CONNECTIONS TO BE RETAINED OR RELOCATED.
- TEST ALL RETAINED ETHERNET AND ELECTRICAL OUTLETS AND ENSURE THAT THEY ARE OPERATIONAL.
- REPAIR ANY DAMAGED WIREMOLD.
- THIS DOCUMENT COVERS ELEMENTS OF ARCHITECTURAL, ELECTRICAL AND MECHANICAL SCOPE
- *- RELOCATE EXISTING OUTLETS TO SUPPORT POWER REQUIREMENTS PROVIDED IN DRAWING A3

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27-AUG-2025 ISSUED FOR CONSTRUCTION



Drawing Title.

PROPOSED FLOOR PLAN

Sheet no.

A2

University of Toronto



Office of Facilities Management & Space Planning

Project

MSB 5318 : LAB REFRESH

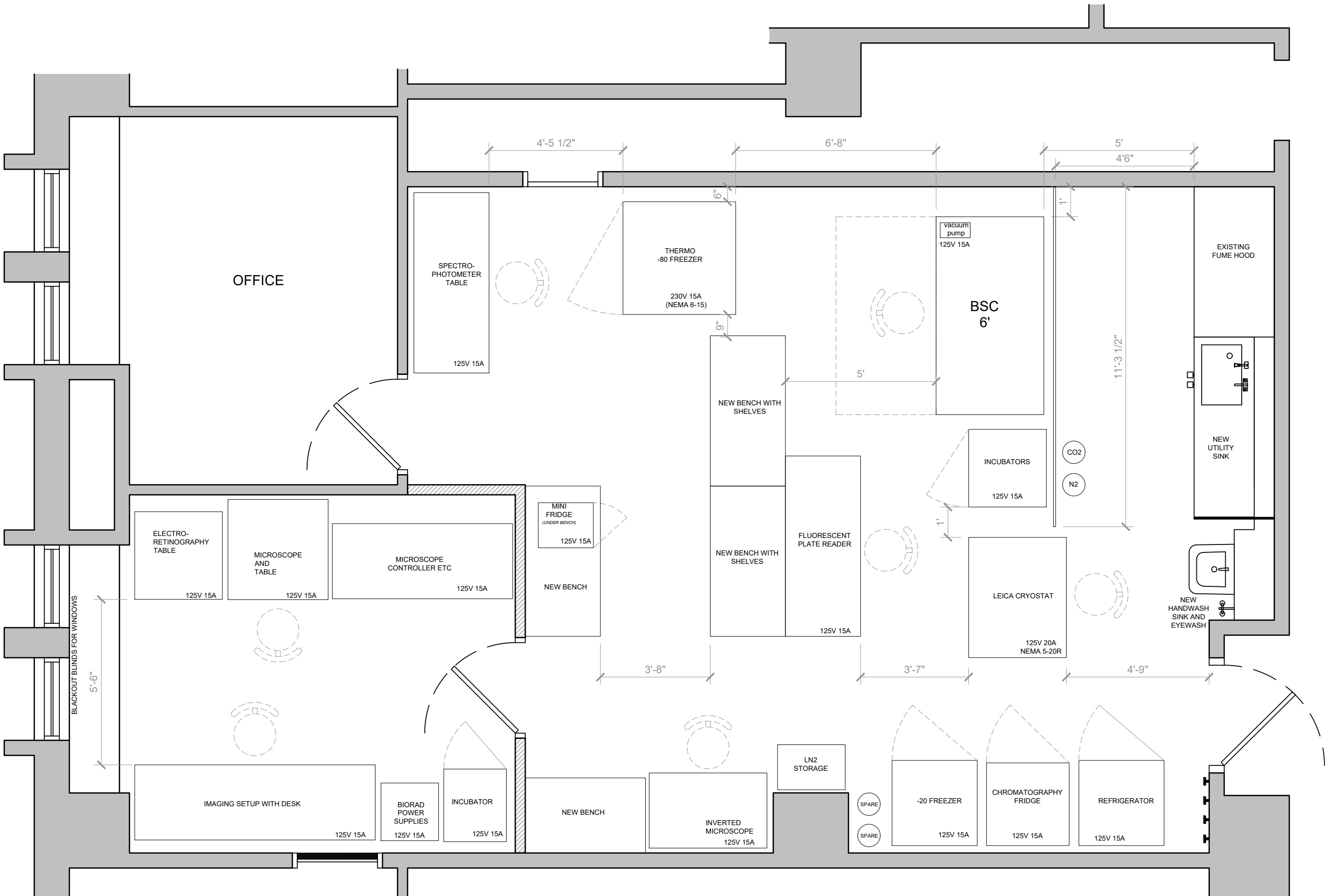
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Building 1 KING'S COLLEGE CIRCLE

Scale NTS

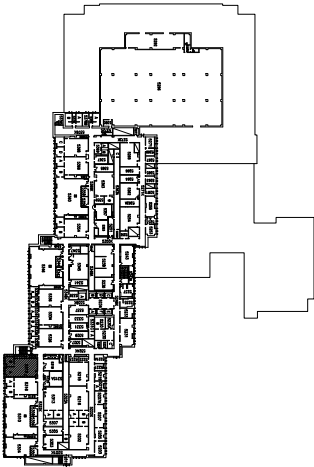
Date 31-JUL-2025

Print Format 11X17

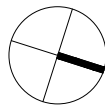


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12-AUG-2025 ISSUED FOR APPROVAL



EQUIPMENT LAYOUT PLAN

Sheet no. **A3**

University of Toronto

Office of Facilities Management & Space Planning

Project **LAB RENOVATION - MSB (LOCATION TBD)**

| | |
|-----------------------------|-------------------------|
| TEMERTY FACULTY OF MEDICINE | |
| Building | 1 KING'S COLLEGE CIRCLE |
| Scale | NTS |
| Date | 12-AUG-2025 |
| Print Format | 11X17 |

APPENDIX - 2

Separate PDF file)



Scope of Work – Designated Substances Abatement/Procedures

MSB 5318 Lab Refresh

Medical Sciences Building (MSB) 1 King's College Circle Toronto M5S 1A8

The intent of this scope is to remove asbestos-containing materials and other designated substances required for the above-mentioned project. Please follow the project drawings for locations of materials to be removed. This document also includes procedures to be followed while working, disturbing or working around the designated substances. Designated substances are defined in O. Reg. 490/09 under Occupational Health and Safety Act, R.S.O. 1990).

In addition to this scope of work, the project shall be governed in its entirety by Ontario Occupational Health and Safety Act and any Regulations made under this Act.

For information on designated substances for the current project refer to *Designated Substances in Building Materials Survey Report* issued for this project

All ventilation shutdowns for the purpose of isolating and capping the ventilation system will be schedule after regular hours 5:00pm to 11:00pm weekdays and weekends [NO CHANGE EXPECTED].

All asbestos work is scheduled to be carried out after hours from 6:00pm to 6:00am all days [NO CHANGE EXPECTED]. Enclosure set-up in vacant areas can be done during regular work hours.

For demolition of non-asbestos building materials, please follow demolition key notes and demolition plans along with any details included in project documents.

Any demolition that may disturb existing or discovered asbestos-containing materials shall be performed by qualified asbestos workers following appropriate asbestos procedures.

All adjacent spaces and offices shall remain operational during the project. It is important that noise level and worker movement remains at an absolute minimum within the work areas and in the adjacent corridors.

It is the contractor's responsibility to verify the extent of work, quantities and other site conditions.

Where required, in order to achieve the architectural, electrical and mechanical requirements of this project, the abatement work and procedures provided in the sub-sections below shall be completed by the contractor.

The University of Toronto asbestos waste bin located on the south of central steam plant (17 Ursula Franklin Street, Toronto, ON M5S 2S2) can be used for disposing asbestos waste only.

TRAINING

Any worker who may inadvertently come into contact with any asbestos-containing materials in the course of their work for the current project must have at a minimum Asbestos Awareness Training as outlined in the University of Toronto, Asbestos Management Program, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>.

Workers performing any asbestos work will require appropriate training, including respirator fit testing, as identified in Ontario Regulation 278/05 and the University of Toronto Asbestos Management Program, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>. In case of conflict the more stringent procedures shall apply.

Workers performing removal or disturbance of surfaces applied with lead based paint and lead-containing materials shall have appropriate training, including respirator fit testing, as identified in



Ontario Ministry of Labour, Immigration, Training and Skills Development Guidelines for Lead on Construction Projects, available at <https://www.labour.gov.on.ca/english/hs/pubs/lead/> and the University of Toronto Lead Management Program/Standard Operating Procedures for the Control of Lead During Building Maintenance and Construction Activities, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>. In case of conflict the more stringent procedures shall apply.

Workers performing removal or disturbance of silica-containing materials shall have appropriate training, including respirator fit testing, as identified in Ontario Ministry of Labour Guideline “Silica on Construction Projects” available at <https://www.labour.gov.on.ca/english/hs/pubs/silica/> and The University of Toronto “Crystalline Silica Procedures” available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>. In case of conflict the more stringent procedures shall apply.

Workers performing removal or disturbance of other hazardous materials shall require appropriate trainings as specified in the relevant regulations/guidelines.

Work will only be allowed once the training certificates of workers working inside asbestos enclosures are verified by the consultants and/or the University of Toronto designated staff.

SCOPE OF WORK DETAILS

The project scope includes Rooms 5318 and 5318A and 5318B [current project locations] and corridors (type 2 enclosure for duct isolations and above ceiling work by electrical/mechanical or other trades).

All tools or other equipment shall be decontaminated by using a vacuum equipped with a HEPA filter and by damp wiping/washing when leaving the asbestos containment area.

For all general demolition areas, negative air machines shall be installed that are able to maintain a negative pressure relative to the area outside the work area.

In order to achieve the architectural, electrical and mechanical requirements of this project, the asbestos abatement scope includes, but is not limited to, removal and disposal of asbestos-containing vinyl floor tiles, including mastic, sinks with asbestos coating, carpets that may have asbestos mastic or floor tiles adhered, asbestos paper on pipe hangers, asbestos insulation, as required under the current project drawings/scope.

The asbestos Type 2 asbestos scope of work also includes installation of any new work in the current project locations due to presence of asbestos-containing fireproofing above ceiling. The abatement work and procedures provided in the sections below shall be completed by the contractor.

The General Contractor shall include the applicable work description in sub-sections below in the Base Bid Price.

1. SECTION 1: Type 2 Asbestos Floor Tile Removal and other Abatement Work

- 1.1 Setup Type 2 enclosure/s including full enclosure including walls and ceiling covering with negative air pressure.
- 1.2 Allow the University of Toronto Trades to cut and cap the ventilation system.
- 1.3 Remove and dispose of required sinks with asbestos coatings present.
- 1.4 Remove and dispose of asbestos paper present on glass pipe hangers and joints.



- 1.5 Remove and dispose of carpets, carpet can be disposed of as non-asbestos if no floor tiles or asbestos mastic is present.
- 1.6 Remove and dispose of diffusers and grilles from the ceilings, cover the openings created with poly and tape.
- 1.7 Remove and dispose asbestos-containing vinyl flooring and adhesive mastic including under fixed cabinetry as required by the project scope of work. Follow asbestos type 2 procedures. Grind adhesive mastic/glue, present under existing flooring down to the concrete floor finish, by using grinders (Diamatic 780PRO or equivalent) equipped with an individual HEPA filtered dust collecting assembly. Adhesive mastic/leveling compound removal from congested spots or edges shall be performed by smaller hand grinders equipped with HEPA filtered attachments.
- 1.8 Clean, decontaminate enclosure and dispose of the enclosure as asbestos waste upon approval of visual inspection by others.

2. **SECTION 2: Type 2 Asbestos Work above ceilings in areas with Asbestos Sprayed Fireproofing**

NOTE: Multiple mobilizations and demobilizations are anticipated for this section, please price accordingly.

- 2.1 The General Contractor shall determine exact locations, sizes, duration and all other schedule details for such enclosures.
- 2.2 Please follow the project architectural, electrical and mechanical drawings for specific locations and extent of all items described herein and should be referred to for any specialized notes or details. Any demolition work that may disturb asbestos-containing materials shall be performed by a qualified abatement contractor. Work under this section includes any above ceiling inspections, plumbing work, piping work, installing conduits, electrical work, diffuser and grill installation or other work required in ceiling spaces by any trade on any level of the building in areas that contain asbestos fireproofing spray above.
- 2.3 Set-up type 2 asbestos enclosure/s (with full enclosure and negative air pressure) at locations where work above ceiling level is required for the current project, in areas which contain asbestos sprayed fireproofing. Remove, clean and save the ceiling tiles/grid. The General contractor to determine exact locations, sizes, duration and all other schedule details for such enclosures.
- 2.4 **For the purpose of pricing, please consider gross area not to exceed 20 square meter of all Type 2 enclosure/s to be constructed in single/multiple locations or floors and one time/multiple times. Each enclosure construction shall be considered individually for area measurement. Each enclosure shall be scheduled for a minimum of 8 hours work shift.**
- 2.5 A 3rd party consultant or other designated staff to inspect and confirm area of all enclosure constructed under this section. No enclosure will be accepted for billing purposes unless inspected and measured before work begins.
- 2.6 HEPA vacuum debris from the ceiling and other surfaces within the enclosure/s (where applicable). **No power tools shall be used to remove fireproofing material.**
- 2.7 The abatement contractor shall maintain enclosure integrity while work by other trades is in progress inside the enclosure.
- 2.8 In the event of work not being completed in one shift:



2.8.1 Re-instate all ceiling tiles, grid etc. to original at the end of each work shift.

3. SECTION 3: Other Items Involving Asbestos Procedures

- 3.1 For locations where drilling of holes and removing bolts/screws in masonry wall applied with asbestos-containing sealant underneath is required, as specified on architectural demolition scope of work and drawings issued for the project, the University of Toronto Standard Operating Procedure ID R2.13 (attached) shall be followed.
- 3.2 The University of Toronto Standard Operating Procedure ID R1.70 (attached), shall be used for disturbance or removal of block masonry wall applied with asbestos-containing sealant underneath the paint, using non-powered hand tools. If working in a public corridor or outside hoarded construction areas, the work must take place inside an asbestos Type 2 enclosure [with negative air pressure] to prevent the spread of construction dust. Bag and dispose all removed cinder blocks as asbestos waste.
- 3.3 The University of Toronto Standard Operating Procedure ID R2.14 (attached), shall be used for disturbance or removal of block masonry wall applied with asbestos-containing sealant underneath the paint, using HEPA filtered power tools. If working in a public corridor or outside hoarded construction areas, the work must take place inside an asbestos Type 2 enclosure [with negative air pressure] to prevent the spread of construction dust. Follow Type 2 asbestos procedures with full enclosure and negative air pressure relative to the areas outside the enclosure if using powered tools with no HEPA filter. Bag and dispose all removed cinder blocks as asbestos waste.
- 3.4 Type 1 asbestos procedures shall be followed for work on asbestos transite counters/other transite surfaces including breaking, cutting, abrading, grinding, sanding or vibrating, provided the material is wetted and the work is done only by means of non-powered hand-held tools.
- 3.5 Type 2 asbestos procedures shall be followed for work on asbestos transite counters/other transite surfaces including breaking, cutting, abrading, grinding, sanding or vibrating, if the material is not wetted and the work is done only by means of non-powered hand-held tools or the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
- 3.6 For locations where drilling of holes and removing bolts/screws from asbestos transite counters/other transite surfaces is required, as specified on architectural demolition scope of work and drawings issued for the project, the University of Toronto Standard Operating Procedure ID R2.04 (attached) shall be followed.
- 3.7 For entry and any work inside mechanical shafts and risers, follow the University of Toronto Standard Operating Procedures ID 0.10 and ID R2.10 (attached).

4. SECTION 4: Type 2 Glove bag Asbestos Abatement [Asbestos-containing thermal mechanical insulation]

For locations where removal of thermal mechanical insulation is required, as specified on project scope of work and drawings. Asbestos Type 2 glovebag removal procedures shall be used. Type 2 procedures (with full enclosure) may be used at locations where glovebag removal is not possible provided the quantity of material to be removed is one square meter or less. Remove and dispose asbestos-containing insulation present on piping systems (including elbows, tees, bends, pipe tapers, pipe straights etc.) required for the project including inside mechanical risers and at any other level of the building. General contractor to determine exact locations. **For the purpose of Base Bid consider a total of 2 linear meter of pipe straight**



section and 6 elbows, tees, bends, hangers, pipe tapers etc. with asbestos-containing insulation (located in different project areas) on less than 150mm diameter piping system.

5. SECTION 5: Lead Abatement/Procedures

All paint finishes on walls, structural components, windows, doors, bulkheads, baseboards, floors, ceilings, piping systems, ductwork, mechanical equipment and all other surfaces within the current project locations and other areas of the building should be assumed to contain lead (any concentration) unless proven otherwise through confirmatory sampling or a review of previous sampling/abatement records.

Work of removal and disposal of all loose, bubbling and peeling paint finishes, including discovered behind fixed cabinetry and wall fixtures (any lead-containing concentration), within the current project locations is included in this scope of work.

Work involving sanding, grinding or any other disturbance or removal of lead-based materials or surfaces applied with lead paint (any concentration) is included in this scope of work.

The classification, general measures and procedures (or Type of operations) required for removal or disturbance of lead paint, lead painted materials and lead based materials depend on the type of work to be conducted for the current project, the procedures adopted and the limit of lead in paint accepted by the General Contractor and their sub-contractors.

For removal or disturbance of lead paint, lead painted materials and lead based materials, the General Contractor and their sub-contractors work procedures and training requirements as identified in Ontario Ministry of Labour, Immigration, Training and Skills Development Guidelines for Lead on Construction Projects, available at <https://www.labour.gov.on.ca/english/hs/pubs/lead/> and the University of Toronto Standard Operating Procedures for the Control of Lead During Building Maintenance and Construction Activities, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>. In case of conflict the more stringent procedures shall apply.

Lead-containing wastes should be recycled if practicable or handled and disposed of according to Ontario Regulation 347.

6. SECTION 6: Silica Abatement/Procedures

Crystalline silica is the primary component of concrete, concrete block, cement, mortar, drywall etc. where scheduled for disturbance or demolition for the current renovation project.

For any work involving disturbance or removal of silica containing materials, the Contractor shall follow work procedures and training requirements as identified in:

The Ontario Ministry of Labour Guideline “Silica on Construction Projects” available at <https://www.labour.gov.on.ca/english/hs/pubs/silica/> and The University of Toronto “Crystalline Silica Procedures” available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>. In case of conflict the more stringent procedures shall apply.

The classification, general measures and procedures (or Type of operations) required shall depend on the type of work to be conducted and the procedures adopted by the contractor. The following section outlines the classification of silica containing materials disturbance based on the guideline and procedures referred above.

Type 1 Operations



- Drilling of holes in concrete or rock that is not part of a tunneling operation or road construction.
- Any other operation at a project that requires the handling of silica-containing material in a way that may result in a worker being exposed to airborne silica.
- Entry into a dry mortar removal or abrasive blasting area while airborne dust is visible for less than 15 minutes for inspection and/or sampling.

Type 2 Operations

- Removal of silica containing refractory materials with a jackhammer.
- The drilling of holes in concrete or rock that is part of a tunneling or road construction.
- The use of a power tool to cut, grind, or polish concrete, masonry, terrazzo or refractory materials.
- The use of a power tool to remove silica containing materials.
- Tuckpoint and surface grinding.
- Dry mortar removal with an electric or pneumatic cutting device.
- Dry method dust cleanup from abrasive blasting operations.
- Entry into area where abrasive blasting is being carried out for more than 15 minutes.

Type 3 Operations

- Abrasive blasting with an abrasive that contains ≥ 1 per cent silica.
- Abrasive blasting of a material that contains ≥ 1 per cent silica.

7. SECTION 8: General

- 7.1 In addition to this Scope of Work, the project shall be governed by the following. In the event of any conflict, most stringent shall apply.
- 7.1.1 Ontario Regulation 278/05, Occupational Health and Safety Act.
- 7.1.2 University of Toronto Asbestos Management Program, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>
- 7.1.3 Ontario Ministry of Labour Guidelines for Lead on Construction Projects, available at <https://www.labour.gov.on.ca/english/hs/pubs/lead/>
- 7.1.4 University of Toronto Lead Management Program for Building Maintenance and Construction Projects Standard/Standard Operating Procedures for the Control of Lead, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>
- 7.1.5 Ontario Ministry of Labour Guideline “Silica on Construction Projects” available at <https://www.labour.gov.on.ca/english/hs/pubs/silica/>
- 7.1.6 University of Toronto “Crystalline Silica Procedures” available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>
- 7.2 All scaffold and/or other equipment assemblies in order to access work locations shall be in accordance with the standards required under applicable Acts and Regulations.
- 7.3 Rip-proof (orange) polyethylene sheet (6 mills thickness) shall be used for all enclosures and drop sheets.
- 7.4 All asbestos waste shall be placed into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing



asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags shall be rip-proof Polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.

- 7.5 Ventilation to and from the work area will remain shutdown during the work. However, the contractor will be required to temporarily seal (polyethylene sheet seals) all ventilation inlets and outlets.
- 7.6 Quality Control inspections will be performed by a consultant throughout the project. Any contamination of surround areas indicated by visual inspection will require the complete enclosure and clean-up of the affected areas without any extra cost to the University of Toronto.
- 7.7 The contractor to protect against any damage to all electrical/mechanical systems, sprinklers, cables, conduits etc. during the execution of work.
- 7.8 All bagged and other normal construction waste disposal shall be done on dates and time coordinated with the Project Manager.

8. SECTION 8: Isolation/Installation Responsibilities (Asbestos Abatement Work)

| <u>Item</u> | <u>Responsibility</u> |
|--|------------------------------|
| Ventilation shutdowns and ductwork capping | Arranged by Project Manager |

END OF DOUMENT



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Non-Asbestos Work in Chases (Shafts)

ID 0.10

**ENTRY INTO MECHANICAL CHASES (SHAFTS)
IN BUILDINGS WITH ASBESTOS-CONTAINING SPRAYED FIREPROOFING**

This section addresses entry and non-asbestos work performed in mechanical chases where asbestos-containing sprayed fireproofing is exposed and present, and where overspray may be present on horizontal and vertical surfaces. If there is damaged asbestos material, report to your supervisor and contact Facilities and Services, Hazardous Construction Materials Group (HCMG) for repair/clean-up. Do not proceed with work until repair/clean-up has been completed.

1.0 APPLICATION

1.1 Certain work activities can be performed by entering into these chases without the requirement for asbestos precautions as long as no asbestos material is being disturbed or damaged. These activities are:

- Entry into and moving through the chase.
- Turning valves, switches, work on electrical panels/equipment etc. if not contaminated with asbestos.
- Inspection, checking metres, reading instruments etc.
- Work on shaft doors and associated locks where no asbestos contamination or materials are present*.

When performing the above, do not disturb any asbestos material, including sprayed fireproofing or overspray on structure and cross bracing. It should be noted that storing items in these spaces is discouraged.

1.2 General reminders:

- Prior to walking in the area and before beginning work, conduct a quick visual inspection. Report any fallen debris/potential sprayed asbestos fireproofing to your supervisor and arrange for clean up following asbestos procedures prior to continuing work.
- Before starting work, inspect the equipment you will be working on (e.g. electrical panel, conduit, cable, valve, switch, etc.) and whether there is any potential for disturbing asbestos. Be aware of working close to the ceiling where asbestos sprayed fireproofing may be present and be accidentally disturbed during the work. Follow appropriate Type 2 procedures if there is potential for disturbance. Speak to your supervisor if you have any concerns.

1.3 Any "work" in a mechanical chase, not described above, is considered asbestos disturbance and Type 2 or 3 procedures, as outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act, must be followed.

1.4 Removal or disturbance of less than 1 square metre of friable material is a Type 2 Procedure. Please refer to U of T SOP ID R2.10 for detailed instructions on the appropriate procedure to follow. The requirements of SOP ID R2.10 apply except for the requirement for an enclosure.

1.5 Removal or disturbance of more than 1 square metre of friable material is a Type 3 Procedure. Type 3 asbestos work requires additional training and is conducted by external asbestos contractors only. Contact HCMG if Type 3 work is required.

1.6 *For fire-rated doors with friable asbestos-containing core materials, the door itself contains asbestos; refer to SOP R1.50 or SOP 2.50 where applicable and appropriate.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 1 Operations

ID R1.70

DEMOLISHING CINDERBLOCK WALL WITH ASBESTOS-CONTAINING COATING USING HAND TOOL

1.0 APPLICATION

- 1.1 This procedure applies to demolishing cinderblock walls with asbestos-containing coating using hand tools such as sledge hammers. This work is classified as a Type 1 operation (Section 12(3)8 of 278/05).
- 1.2 Disturbance of this material using power tools is a Type 2 procedure – refer to R2.13 (drilling only) or R2.14 (breaking, cutting, abrading, grinding, sanding or vibrating).

2.0 DEFINITIONS

- 2.1 *Damp-Wiping:* A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.
- 2.2 *Work Areas:* Where actual work activity involving asbestos takes place.

3.0 MATERIALS AND EQUIPMENT

- 3.1 *HEPA Vacuum:* Vacuum cleaner equipped with a High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 *Dropsheet:* Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.3 *Amended Water:* A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.
- 3.4 *Sprayer:* Sprayer with mist nozzle for application of amended water or sealant.
- 3.5 *Asbestos Waste Receptacles:* Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.
- 3.6 *Small Tools:* Sponge(s), bucket(s), ladder, etc.
- 3.7 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene bags.
- 3.8 *Respirator:* Respirators are optional. See section 4.2.
- 3.9 *Coveralls:* Full body disposable clothing of an appropriate size with attached hood. It should be elasticized at the cuffs and hood, and be made of material which does not readily retain or permit penetration of asbestos fibres.

- 3.10 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.

4.0 PERSONAL PROTECTION

- 4.1 While not mandatory, workers are strongly advised to wear respirators.
- 4.2 If a worker requests a respirator; the following shall apply:
- 4.2.1 All respiratory equipment shall be individually assigned and identified.
- 4.2.2 Each worker must attend respiratory protection training and be fit tested prior to beginning work.
- 4.2.3 Workers shall wear at least a half facepiece respirator fitted with purple HEPA (P100) filters.
- 4.2.4 Disposable single-use type respirators are not permitted.
- 4.2.5 All respirators shall be approved and labelled for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
- 4.2.6 Replace filter cartridges as appropriate (36 hours of use or more frequently).
- 4.3 Due to general construction dust, workers must wear disposable coveralls:
- 4.4 A worker who is provided with protective clothing shall, before leaving the work area:
- 4.4.1 Decontaminate his or her protective clothing and footwear by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
- 4.4.2 If the protective clothing will not be reused, place it in an asbestos waste receptacle.
- 4.5 Eye protection and safety shoes must be worn for this task.
- 4.6 Facilities for washing hands and face must be provided and shall be used by every worker when leaving asbestos work areas.
- 4.7 Smoking, eating, drinking or chewing in asbestos work areas is prohibited.

5.0 PREPARATION - WORK AREAS

- 5.1 While it is not necessary to post signs for a Type 1 operation, it is a good practice to prevent others from entering the immediate vicinity of the work area.
- 5.2 When people are still in the area where work is to be done the Type I "Minor Asbestos Work Description" (last page of this SOP) should be filled out and distributed to anyone likely to be near the work being carried out.
- 5.3 Before beginning work, remove any visible dust from the work area by HEPA vacuuming or damp wiping.
- 5.4 Before beginning work, wherever practicable, cover floor below the work with polyethylene drop-sheets to catch debris.
- 5.5 Type 1 asbestos work does NOT require the use of enclosures. If working in a public corridor or outside a hoarded construction areas, the work must take place inside an asbestos Type 2 enclosure [with negative air pressure] to prevent the spread of construction dust.

6.0 EXECUTION

- 6.1 Use only hand-held non-powered tools. Do not use compressed air.

- 6.2 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material.
- 6.3 No power tools are allowed.
- 6.4 Outline the area to be demolished with a coloured pencil or marker.
- 6.5 Before using hammer or other large hand tools, check nearby surrounding. Other nearby workers or objects may be struck by the swing of the hammer or hand tool. Swing and move the tool only if there is sufficient space to prevent injury to others and/or unwanted damage.
- 6.6 Strike or hit the desired area with the hammer. Repeat as required.
- 6.7 On completion of work, clean all surfaces, tools, equipment, and work shoes by HEPA vacuuming or by damp wiping. Drop-sheets and used cleaning cloths must be wetted and disposed of as asbestos waste. Double bag all waste and dispose of as described in section 7.1.

7.0 WASTE TRANSPORT AND DISPOSAL

- 7.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 7.2 *For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.
- 7.3 Cinderblock waste with asbestos-containing coating must be disposed of as asbestos waste.

APPENDIX A: MINOR ASBESTOS WORK DESCRIPTION (TYPE 1)

Date: _____ Start time: _____ Stop time (approx.): _____

Building: _____

Brief Work Description: _____

Supervisor of work party: _____

Name of Contractor or Trade: _____

Property or Project Manager: _____

Please note that workers that work on a daily basis with asbestos may be wearing respiratory protection and protective coveralls when working in an area where U of T employees, students or Faculty are present in their normal work clothes. This personal protective equipment (PPE) is optional for this kind of work under the asbestos regulations, but may be requested by the asbestos worker if desired. Asbestos workers wear this PPE because they are closer to the work being carried out, and are thus exposed at a much higher level than bystanders. In addition they are exposed to asbestos on a daily basis, and may wish to ensure that their total exposure is as low as possible. U of T employees in the area are not exposed on a daily basis, and thus are not subjected to the same level of risk. Please see the section on non-occupational exposure for more details.

ASBESTOS WORK

University employees as well as contractors are sometimes required to conduct work that involves the disturbance of asbestos-containing materials. Such work activities are strictly regulated. They are first categorized into three types of work operations - **Type 1 (low risk – the type covered by this form)**, Type 2 (moderate risk) or Type 3 (high risk). For each of these, the Asbestos Management Program designates corresponding standard operating procedures to prevent the exposure to airborne asbestos. These procedures include strict requirements for preparation of the work area, use of personal protective equipment, use of proper work practices to reduce the spread of asbestos fibres, personal hygiene practices, and asbestos waste handling.

NON-OCCUPATIONAL EXPOSURE

Asbestos-specific diseases are almost always a result of occupational exposure to asbestos. Non-occupational exposures resulting in disease have only been seen in spouses or other family members living with an asbestos worker, or those who have lived in the neighbourhood of asbestos plants.

Asbestos fibres are naturally occurring and result in a natural background present in our environment. This combined with the widespread use of asbestos in products such as truck brake linings, means that we are all exposed to very small amounts of asbestos in our daily lives. It is not this very low level of exposure that results in asbestos disease but the higher levels of occupational exposure that are of concern to most authorities. Studies have not shown any evidence of asbestos-specific diseases in individuals who breathe asbestos in the outdoor air or who inhale asbestos as occupants of asbestos-containing buildings. Regardless, proper measures for preventing or minimizing exposure to asbestos must always be in place.

If you have any questions about the work being conducted, then please contact the Property Manager or Project Manager listed above.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.04

**DRILLING ASBESTOS CONTAINING MATERIALS (E.g. plaster, mastics, textured boards, stucco, etc.) WITH A
HEPA FILTERED POWER TOOL**

The exposure of workers and the corresponding measures and procedures for the drilling of holes in friable asbestos-containing material are classified as Type 2.

When authorized workers conduct Type 2 activities involving the clean-up of friable asbestos-containing material, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the methods in Ontario Ministry of Labour, Regulations Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Reg. 278/05) and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

- 1.1 These procedures apply to the drilling of holes (each less than ½ inch in diameter) in the asbestos-containing plaster application for the sole purpose of attaching fasteners for wall hangings and the like. This activity may generate enough airborne asbestos to require protective equipment, but is of short duration.

2.0 DEFINITIONS

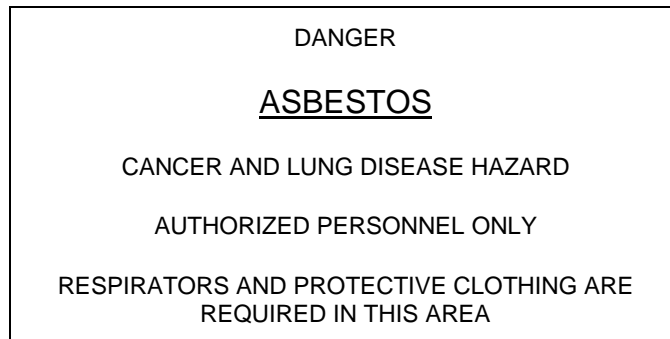
- 2.1 *Work Areas:* Where actual work activity involving friable asbestos takes place.
- 2.2 *Damp Wiping:* A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 MATERIALS AND EQUIPMENT

- 3.1 *HEPA Vacuum:* Vacuum cleaner equipped with High Efficiency Particulate Arresting HEPA Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 *HEPA Filtered Tool:* A tool that has been manufactured specifically for the intended purpose and equipped with a filtering system that meets the same definition for filter efficiency as in Item 3.1.
- 3.3 *Dropsheet:* Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.4 *Amended Water:* A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.
- 3.5 *Sprayer:* Sprayer with mist nozzle for application of amended water or sealant.
- 3.6 *Asbestos Waste Receptacles:* Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area.

Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.

- 3.7 *Small Tools:* Sponge(s), metal bristle brush(es), bucket(s), ladder(s), heavy duty scraper(s), etc.
- 3.8 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene to all surfaces to be covered.
- 3.9 *Respirator:* See section 5 Personal Protective Equipment.
- 3.10 *Coveralls:* Full body disposable clothing of appropriate with attached hood and elasticized at cuffs and hood, made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.11 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.12 *Signage:* Warning of asbestos hazard in the work area:



4.0 NOTICE OF ASBESTOS WORK

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities involving friable asbestos. The following methods of communication apply:

- 4.1 The notification is to include a description of the planned Type 2 activity, its proposed duration, and in general terms the precautionary measures required to maintain a safe work environment. This information is to be provided to the following parties.
 - 4.1.1 All appropriate Directors (St. George, UTM, UTSC, Capital Projects)
 - 4.1.2 Manager, Environmental Hazards and Safety (St. George only)
 - 4.1.3 Director, Environmental Health and Safety
 - 4.1.4 Co-chairs of both the Trades and the Utilities Joint Health and Safety Committees
 - 4.1.5 Co-chairs, Local Joint Health and Safety Committee
 - 4.1.6 Local Area Occupants
- 4.2 Signage at Work Location
 - 4.2.1 This sign informs building users of the asbestos-related work being conducted at that work location and that entry into the area is restricted to authorized personnel only. Signs are to be posted in the work area in sufficient numbers to warn of the hazard.

5.0 PERSONAL PROTECTION

- 5.1 *Respirators:* Workers are required to don respirators when performing Type 2 work. The following shall apply:
 - 5.1.1 All respiratory equipment shall be individually assigned and identified.
 - 5.1.2 Each worker must be instructed and tested with his/her respirator.

- 5.1.3 Workers shall wear at least a half-face piece air-purifying respirator fitted with HEPA (P100) filters (material wetted). If the material cannot be wetted, a full face air-purifying respirator is required. All respirators shall be approved and labelled for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
- 5.1.4 Replace filter cartridges as appropriate (36 hours of use or more frequently). Dispose of used cartridges as asbestos waste.
- 5.1.5 No supervisor or worker shall have facial hair which affects respirator-to-face seal.
- 5.2 *Protective Clothing:* All workers must be provided with full body disposable coverall and shoe covers as described in Section 3.
- 5.3 *Facilities:* Provide facilities for washing hands and face which shall be used by every worker when leaving asbestos work areas.
- 5.4 *Practice:* Workers shall not eat, drink, smoke or chew while in contaminated work areas.
- 5.5 *Work Area Entry:* All persons shall don respirators with HEPA (P100) filters and clean coveralls before entering work area.
- 5.6 *Work Area Exit:* Before leaving the Work Area and still wearing a respirator, a worker shall:-
 - 5.6.1 Thoroughly HEPA vacuum protective clothing, respirator and footwear.
 - 5.6.2 Remove decontaminated coveralls and wash hands and face with water (in Work Area).
 - 5.6.3 Leave the Work Area in street clothes and proceed to the nearest washroom to wash hands and face.
 - 5.6.4 Coveralls may be reused throughout a day provided they are disposed of after each shift, or left inside the Work Area after each use.

6.0 PREPARATION - WORK AREAS

- 6.1 Do not use compressed air.
- 6.2 Clear immediate work areas of all moveable furnishings or equipment.
- 6.3 Erect tape barriers to keep all non-protected personnel at least 30 feet away. Post signs warning of asbestos hazard at tape barrier (see Appendix).
- 6.4 An enclosure is not necessary for this activity. As appropriate, a drop-sheet below the work is required; extend the drop-sheet at least 3 feet beyond line of work. Use rip-proof polyethylene if work is above rough concrete or other surface that could tear polyethylene.
- 6.5 When drilling friable asbestos materials (e.g. plaster), shut down all ventilation to and from the work area. As appropriate, seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting.
- 6.6 When drilling non-friable asbestos materials (e.g. mastic, textured boards, etc.), a ventilation shut down is not required. However, as appropriate, seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting.
- 6.7 Post signs warning of asbestos hazard at the entrances to the work area
- 6.8 Don respiratory equipment and coveralls as described above.

7.0 EXECUTION

- 7.1 Do not use compressed air.
- 7.2 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.3 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material

- 7.4 Drill using a power tool attached to HEPA dust collection following manufacturer's instructions.
- 7.5 Repeat steps above for each additional proposed drilling location.
- 7.6 At completion of work, HEPA vacuum or wet wipe the drop-sheet, tools and equipment.
- 7.7 Any polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste..

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually rip-proof polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 *For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.10

MINOR FRIABLE ASBESTOS REMOVAL

The exposure of workers and the corresponding measures and procedures for the minor disturbance of friable asbestos are classified as Type 2.

When authorized workers conduct Type 2 activities involving the minor disturbance of friable asbestos, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the requirements outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

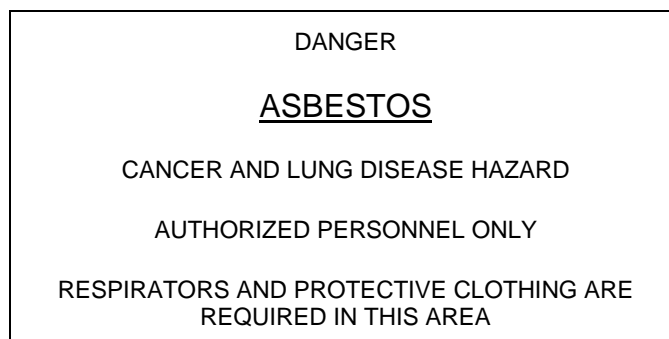
- 1.1 These procedures apply to all work involving the minor removal of friable asbestos-containing material; this activity may generate enough airborne asbestos to require protective equipment, but is of short duration..
- 1.2 Minor removal of material containing asbestos means the removal of **one square meter or less of wet friable material**, including mechanical insulation, sprayed fireproofing and texture plaster. The length of insulated pipe corresponding to the maximum allowable one square metre (10.76 square feet) of insulation may be determined by the following equation:
 - 1.2.1 $\text{Area (outer surface of insulated pipe in sq. ft.)} = \text{Length (of insulated pipe in ft.)} \times 2\pi R$ (or $2 \times 3.14 \times R$ where R = Radius of pipe and insulation).
- 1.3 Work on friable asbestos-containing material is classified according to the total area on which work is done consecutively in a room or enclosed area, even if the work is divided into smaller jobs. O. Reg. 278/05, s. 12 (5). Therefore a project that would be a Type 3 project (removal of more than 1 square metre in a room or area) cannot be broken into smaller amounts in order to be done as a series of Type 2 projects.

2.0 DEFINITIONS

- 2.1 *Work Areas:* Where actual work activity involving asbestos takes place.
- 2.2 *Enclosure:* An impermeable barrier made of rip-proof polyethylene plastic or similar material, inside which the asbestos activity takes place.
- 2.3 *Damp Wiping:* A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 **MATERIALS AND EQUIPMENT**

- 3.1 *HEPA Vacuum:* Vacuum cleaner equipped with a High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 *Dropsheet:* Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.3 *Encapsulant (Sealer):* Bonding agent or sealant which can be applied as a liquid and controls the release of fibres or dust from the surface.
- 3.4 *Amended Water:* A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.
- 3.5 *Sprayer:* Sprayer with mist nozzle for application of amended water or sealant.
- 3.6 *Asbestos Waste Receptacles:* Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.
- 3.7 *Small Tools:* Sponge(s), bucket(s), ladder, etc.
- 3.8 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene bags.
- 3.9 *Respirator:* See section 5 Personal Protective Equipment.
- 3.10 *Coveralls:* Full body disposable clothing of an appropriate size with attached hood. It should be elasticized at the cuffs and hood, and be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.11 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.12 *Signage:* Warning of asbestos hazard in the work area. An example is shown below.



4.0 **NOTICE OF ASBESTOS WORK**

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities involving friable asbestos. The following methods of communication apply:

- 4.1 The notification is to include a description of the planned Type 2 activity, its proposed duration, and in general terms the precautionary measures required to maintain a safe work environment. This information is to be provided to the following parties.

- 4.1.1 All appropriate Directors (St. George, UTM, UTSC, Capital Projects)
- 4.1.2 Manager, Environmental Hazards and Safety (St. George only)
- 4.1.3 Director, Environmental Health and Safety
- 4.1.4 Co-chairs of both the Trades and the Utilities Joint Health and Safety Committees
- 4.1.5 Co-chairs, Local Joint Health and Safety Committee
- 4.1.6 Local Area Occupants
- 4.2 Signage at Work Location
- 4.2.1 This sign informs building users of the asbestos-related work being conducted at that work location and that entry into the area is restricted to authorized personnel only. Signs are to be posted in the work area in sufficient numbers to warn of the hazard.

5.0 PERSONAL PROTECTION

- 5.1 *Respirators:* Workers are required to don respirators when performing Type 2 work. The following shall apply:
 - 5.1.1 All respiratory equipment shall be individually assigned and identified.
 - 5.1.2 Each worker must attend respiratory protection training and be fit tested prior to beginning work.
 - 5.1.3 Workers shall wear at least a half facepiece respirator fitted with purple HEPA (P100) filters.
 - 5.1.4 Disposable single-use type respirators are not permitted.
 - 5.1.5 All respirators shall be approved and labelled for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
 - 5.1.6 Replace filter cartridges as appropriate (36 hours of use or more frequently). Dispose of used cartridges as asbestos waste.
 - 5.1.7 No supervisor or worker shall have facial hair which affects respirator-to-face seal.
- 5.2 *Protective Clothing:* All workers must be provided with full body disposable coverall and shoe covers as described in Section 3.
- 5.3 *Facilities:* Provide facilities for washing hands and face which shall be used by every worker when leaving asbestos work areas.
- 5.4 *Practice:* Workers shall not eat, drink, smoke or chew while in work areas.
- 5.5 *Work Area Entry:* All persons shall wear respirators with HEPA (P100) filters and clean coveralls before entering work area.
- 5.6 *Work Area Exit:* Before leaving the Work Area and still wearing a respirator, a worker shall:
 - 5.6.1 Thoroughly HEPA vacuum protective clothing, respirator and footwear.
 - 5.6.2 Remove decontaminated coveralls and wash hands and face with water (in Work Area).
 - 5.6.3 Leave the Work Area in street clothes and proceed to the nearest washroom to wash hands and face.
 - 5.6.4 Coveralls may be reused throughout a day provided they are disposed of after each shift, and left inside the Work Area after each use.
 - 5.6.5 Thoroughly clean respirator.

6.0 PREPARATION – WORK AREAS

- 6.1 Clear immediate work areas of all moveable furnishings or equipment. Any furnishings or equipment not removed shall be adequately covered and sealed using polyethylene and duct tape.
- 6.2 Remove any friable material containing asbestos and any visible dust that is likely to be disturbed and that is lying on any surface in the vicinity of the work area by HEPA vacuuming or damp wiping.

- 6.3 Provide a temporary enclosure to prevent the spread of airborne dust from the work area. The enclosure shall be as airtight as conditions permit including the provision of a double overlapping flap at the entrance.
- 6.4 Post signs warning of asbestos hazard at the entrances to the work area.
- 6.5 Shut down all ventilation to and from the work area. Seal and tape all ventilation openings within the work area with polyethylene sheeting.
- 6.6 Locate HEPA vacuum body outside enclosure. Locate vacuum hose within enclosure to provide negative pressure effect in enclosure.
- 6.7 Don respiratory equipment, coveralls and shoe covers as describe in Section 5.

7.0 EXECUTION

- 7.1 Use only hand-held non-powered tools. Do not use compressed air.
- 7.2 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.3 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material.
- 7.4 Remove asbestos-containing thermal insulations in layers, maintaining all exposed surfaces of insulation in a wet condition.
 - 7.4.1 Seal exposed ends of asbestos-containing pipe insulation with 6 oz. canvas and lagging.
- 7.5 Remove asbestos-containing sprayed materials by scraping wetted ACM directly into waste containers. Do not allow ACM to fall to the floor of the enclosure.
- 7.6 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.
- 7.7 Carefully remove the asbestos material and place in an asbestos waste receptacle; double bag all waste as described in the Waste Transport and Disposal Section below and HEPA vacuum or damp-wipe the second container immediately prior to passing it out of the work area.
- 7.8 Seal the surfaces from which asbestos-containing material has been removed with a coat of encapsulant (sealer).
- 7.9 Frequently and at regular intervals during the work and immediately upon completion of the work, remove dust and waste from the workplace by HEPA vacuuming or damp-wiping, mopping or wet sweeping.
- 7.10 On completion of work, HEPA vacuum and wet clean all surfaces inside enclosure. Clean all reusable tools and pass out of enclosure. Clean framing for enclosure, plywood, etc. that will be reused and spray with encapsulant (sealer).
- 7.11 When removing enclosure, all polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste.

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 *For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-

container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.13

**DRILLING INTO A WALL THAT CONTAINS A NON-FRIABLE ASBESTOS-CONTAINING COATING USING
A HEPA VACUUM FOR DUST COLLECTION**

The exposure of workers and the corresponding measures and procedures for the minor disturbance of non-friable asbestos are classified as Type 2.

When authorized workers conduct Type 2 activities involving the minor disturbance of non-friable asbestos, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the requirements outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

- 1.1 This procedure applies to drilling holes in a wall that contains a non-friable asbestos-containing coating (e.g. sealant, paint) by means of power tools. For other disturbances (abrading, grinding, sanding or vibrating), refer to Procedure R2.14.
- 1.2 The procedure describes a modified method in Ontario Ministry of Labour, Regulations Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Reg. 278/05) as allowed by Section 23 of the Regulation and is for St. George Campus only. This procedure follows the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

2.0 DEFINITIONS

- 2.1 **Work Areas:** Where actual work activity involving non-friable asbestos takes place.
- 2.2 **Damp Wiping:** A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 MATERIALS AND EQUIPMENT

- 3.1 **HEPA Vacuum:** Vacuum cleaner equipped with a High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 **Dropsheet:** Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.3 **Amended Water:** A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.
- 3.4 **Sprayer:** Sprayer with mist nozzle for application of amended water or sealant.
- 3.5 **Asbestos Waste Receptacles:** Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.
- 3.6 **Small Tools:** Sponge(s), metal bristle brush(es), bucket(s), ladder(s), heavy duty scraper(s), etc.
- 3.7 **Tape:** Reinforced duct tape or double-sided tape suitable for sealing polyethylene to all surfaces to be covered.

- 3.8 *Respirator:* See section 5 Personal Protective Equipment.
- 3.9 *Coveralls:* Full body disposable clothing of an appropriate size with attached hood. It should be elasticized at the cuffs and hood, and be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.10 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.

4.0 NOTICE OF ASBESTOS WORK

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities. The following methods of communication apply:

- 4.1 Small scale activities where only a few holes are required, such as installing shelves, frames, wires, etc.: Notify local occupants of the work to be done per local site procedures.
- 4.2 Larger-scale activities, for example, as part of an overall abatement or construction project, should follow the same "Notice of Asbestos Work" procedures used for other Type 2 and 3 activities.

5.0 PERSONAL PROTECTION

- 5.1 Based on air sampling survey, respiratory protection is not required for coatings that contain 0.5-5% asbestos. However, workers performing the drilling are strongly advised to wear respirators. If the asbestos is >5%, respiratory protection is required.
- 5.2 When wearing a respirator, the following shall apply:
 - 5.2.1 All respiratory equipment shall be individually assigned and identified.
 - 5.2.2 Each worker must attend respiratory protection training and be fit tested prior to beginning work.
 - 5.2.3 Workers shall wear at least a half facepiece respirator fitted with purple HEPA (P100) filters.
 - 5.2.4 Disposable single-use type respirators are not permitted.
 - 5.2.5 All respirators shall be approved for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
 - 5.2.6 Replace filter cartridges as appropriate (36 hours of use or more frequently).
- 5.3 While not mandatory, workers are strongly advised to wear disposable coveralls.
- 5.4 A worker who is provided with protective clothing shall, before leaving the work area:
 - 5.4.1 Decontaminate his or her protective clothing and footwear by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing. Thoroughly clean respirator if applicable.
 - 5.4.2 If the protective clothing will not be reused, place it in an asbestos waste receptacle.
- 5.5 *Facilities:* Provide access to facilities for washing hands and face which shall be used by every worker when/after leaving asbestos work areas.
- 5.6 Smoking, eating, drinking or chewing in asbestos work areas is prohibited.

6.0 PREPARATION - WORK AREAS

- 6.1 Do not use compressed air.
- 6.2 Clear immediate work areas of all moveable furnishings or equipment.
- 6.3 In common areas, erect tape barriers to keep occupants at least 20 feet away. Other works not associated with the asbestos work shall stay away at least 20 feet from the work area. No signage is required.
- 6.4 An enclosure is not necessary for this activity. As appropriate, a drop-sheet below the work is required; extend the drop-sheet at least 3 feet beyond line of work. Use rip-proof polyethylene if work is above rough concrete or other surface that could tear polyethylene.
- 6.5 No ventilation shutdown is required. Seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting.
- 6.6 Don respiratory equipment and coveralls if applicable.

7.0 EXECUTION

- 7.1 Do not use compressed air.
- 7.2 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.3 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material.
- 7.4 Follow manufacturer's direction to operate the HEPA vacuum. Position the tool at the proposed location and the nozzle of the HEPA vacuum directly below the proposed location. Apply a gentle force and move the tool slowly as needed. Remove the drill about 5 seconds after the hole or cut is completed. HEPA vacuum the hole with nozzle to remove any loose dust from the hole.
- 7.5 Repeat steps above for each additional proposed location.
- 7.6 At completion of work, HEPA vacuum or wet wipe the drop-sheet, any other surfaces below the work area, tools and equipment.
- 7.7 Any polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste.

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually rip-proof polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 * For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.14

**DISTURBANCE OF WALL THAT CONTAINS A NON-FRIABLE ASBESTOS-CONTAINING COATING USING
A HEPA FILTERED POWER TOOL**

The exposure of workers and the corresponding measures and procedures for the minor disturbance of non-friable asbestos are classified as Type 2.

When authorized workers conduct Type 2 activities involving the minor disturbance of non-friable asbestos, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the requirements outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

- 1.1 This procedure applies to breaking, cutting, abrading, grinding, sanding or vibrating a wall that contains a non-friable asbestos-containing coating (e.g. sealant, paint) by means of power tools that are attached to dust-collecting devices equipped with HEPA filters. This work is classified as a Type 2 operation (Section 12(3)8 of 278/05). For drilling holes in the same type of wall, refer to Procedure R. 2.13.
- 1.2 The procedures follow the methods in Ontario Ministry of Labour, Regulations Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Reg. 278/05) and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

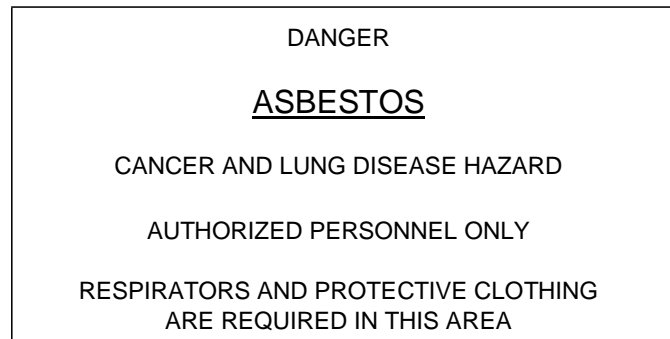
2.0 DEFINITIONS

- 2.1 **Work Areas:** Where actual work activity involving non-friable asbestos takes place.
- 2.2 **Damp Wiping:** A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 MATERIALS AND EQUIPMENT

- 3.1 **HEPA Vacuum:** Vacuum cleaner equipped with High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 **HEPA Filtered Tool:** A tool that has been manufactured specifically for the intended purpose and equipped with a filtering system that meets the same definition for filter efficiency as in Item 3.1.
- 3.3 **Dropsheet:** Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos..
- 3.4 **Sprayer:** Sprayer with mist nozzle for application of amended water or sealant.
- 3.5 **Asbestos Waste Receptors:** Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.

- 3.6 *Small Tools:* Sponge(s), metal bristle brush(es), bucket(s), ladder(s), heavy duty scraper(s), etc.
- 3.7 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene to all surfaces to be covered.
- 3.8 *Respirator:* See section 5 Personal Protective Equipment.
- 3.9 *Coveralls:* Full body disposable clothing of appropriate size with attached hood and elasticized at cuffs and hood, made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.10 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.11 *Signage:* Warning of asbestos hazard in the work area:



4.0 NOTICE OF ASBESTOS WORK

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities. The following methods of communication apply:

- 4.1 The notification is to include a description of the planned Type 2 activity, its proposed duration, and in general terms the precautionary measures required to maintain a safe work environment. This information is to be provided to the following parties:
 - 4.1.1 All appropriate Directors (St. George, UTM, UTSC, Capital Projects)
 - 4.1.2 Manager, Hazardous Construction Materials Group (St. George only)
 - 4.1.3 Director, Occupational Health and Safety
 - 4.1.4 Co-chairs of both the Trades and the Utilities Joint Health and Safety Committees
 - 4.1.5 Co-chairs, Local Joint Health and Safety Committee
 - 4.1.6 Local Area Occupants
- 4.2 Signage at the Work Location
 - 4.2.1 This sign informs building users of the asbestos-related work being conducted at that work location and that entry into the area is restricted to authorized personnel only. Signs are to be posted in the work area in sufficient numbers to warn of the hazard.

5.0 PERSONAL PROTECTION

- 5.1 *Respirators:* Workers are required to don respirators when performing Type 2 work. The following shall apply:
 - 5.1.1 All respiratory equipment shall be individually assigned and identified.
 - 5.1.2 Each worker must be instructed and fit tested with his/her respirator.
 - 5.1.3 Workers shall wear at least a half-face piece air-purifying respirator fitted with HEPA (P100) filters (material wetted). If the material cannot be wetted, a full face air-purifying respirator is required.

- 5.1.4 Disposable single-use type respirators are not permitted.
- 5.1.5 All respirators shall be approved for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
- 5.1.6 Replace filter cartridges as appropriate (36 hours of use or more frequently). Dispose of used cartridges as asbestos waste.
- 5.1.7 No supervisor or worker shall have facial hair which affects respirator-to-face seal.
- 5.2 *Protective Clothing:* All workers must be provided with full body disposable coverall and shoe covers as described in Section 3.
- 5.3 *Facilities:* Provide access to facilities for washing hands and face which shall be used by every worker when/after immediately leaving asbestos work areas.
- 5.4 *Practice:* Workers shall not eat, drink, smoke or chew while in contaminated work areas.
- 5.5 *Work Area Entry:* All persons shall don respirators with HEPA (P100) filters and clean coveralls before entering work area.
- 5.6 *Work Area Exit:* Before leaving the Work Area and still wearing a respirator, a worker shall:-
 - 5.6.1 Thoroughly HEPA vacuum protective clothing and footwear.
 - 5.6.2 Remove decontaminated coveralls and respirator, and wash hands and face with water (in Work Area).
 - 5.6.3 Leave the Work Area in street clothes and proceed to the nearest washroom to wash hands and face.
 - 5.6.4 Coveralls may be reused throughout a day provided they are disposed of after each shift, or left inside the Asbestos Work Area after each use.

6.0 PREPARATION - WORK AREAS

- 6.1 Do not use compressed air.
- 6.2 Clear immediate work areas of all moveable furnishings or equipment.
- 6.3 Erect tape barriers to keep all non-protected personnel at least 20 feet away. Post signs warning of asbestos hazard at tape barrier (see Signage in Section 3).
- 6.4 An enclosure is not necessary for this asbestos work under the O. Regulation 278/05. However, an enclosure may be used to provide general dust control or provide a barrier in public areas. As appropriate, a drop-sheet below the work is required; extend the drop-sheet at least 3 feet beyond line of work. Use rip-proof polyethylene if work is above rough concrete or other surface that could tear polyethylene.
- 6.5 Seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting. No ventilation shutdown is required.
- 6.6 Post signs warning of asbestos hazard at the entrances to the work area
- 6.7 Don respiratory equipment and coveralls as described above.

7.0 EXECUTION

- 7.1 Do not use compressed air.
- 7.2 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.3 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material.
- 7.4 Follow manufacturer's direction to operate the HEPA vacuum. Apply a gentle force and move the tool Follow manufacturer's direction to operate the HEPA filtered tool slowly as needed. Remove the tool about 5 seconds after the hole or cut is completed.

- 7.5 Repeat steps above for each additional proposed location.
- 7.6 At completion of work, HEPA vacuum or wet wipe the drop-sheet, any other surfaces below the work area, tools and equipment.
- 7.7 Any polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste.

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually rip-proof polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 * For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.
- 8.3 Cinderblock waste with asbestos-containing coating must be disposed of as asbestos waste.

September 16, 2025

Attention: Mr. Ron Shakespeare

**Re: Designated Substances in Building Materials Survey Report [DSSR]
MSB 5318 Lab Refresh
Medical Sciences Building (Building #005)**

Dear Mr. Shakespeare:

Further to your request Hazardous Construction Materials Group (HCMG) is pleased to provide this report summarizing the observations made during the review of available reports, abatement records, bulk sampling records and current investigation/sampling for accessible designated substances in building materials for the above captioned project locations at University of Toronto Medical Sciences Building (Building #005) located at 1 King's College Circle Toronto M5S 1A8.

Ontario Regulation 490/09 - Designated Substances (O. Reg. 490/09), made under the Occupational Health and Safety Act outlines required steps to control exposure of workers to designated substances. Under O. Reg. 490/09 there are eleven (11) designated substances, acrylonitrile, arsenic, asbestos, benzene, coke oven emissions, ethylene oxide, isocyanates, lead, mercury, silica and vinyl chloride. This regulation applies to every employer and worker at a workplace where the designated substances are present, produced, processed, used, handled or stored and at which a worker is likely to be exposed to the designated substance. This assessment, issued for the above-mentioned project satisfies the Owner's requirements under Section 30 of the Ontario Occupational Health and Safety Act (OHSA), Revised Statutes of Ontario 1990, as amended.

This report provides the status of designated substances in specific for Rooms 5318, 5318A and 5318B [current project locations]. In addition, this report also provides a general assessment of designated substances for the remaining areas of the building.

For a detailed designated substances abatement scope of work please refer to the following document issued for this project:

Scope of Work – Designated Substances Abatement/Procedures

MSB 5318 Lab Refresh

Medical Sciences Building (Building #005) 1 King's College Circle Toronto M5S 1A8

This report covers building materials only and does not cover any laboratory equipment, chemicals, biological agents, radiological material or radiation sources, fume hoods, laboratory bench tops, cabinetry and/or associated ductwork. Fume hoods, laboratory bench tops, cabinetry and associated ductwork should be tested for the above agents and if present should be appropriately decontaminated before any disturbance, work, removal or disposal.

In the event the General Contractor observes any suspect asbestos-containing material, the work shall be immediately stopped and the Project Manager be contacted to arrange further investigation and abatement.

Quality control inspections for designated substances disturbance/removal will be performed by designated external consultant and the University of Toronto staff throughout the project. Any contamination of surround areas indicated by visual inspection or air monitoring will require complete clean-up of the affected areas, by the General Contractor, without any extra cost to the University of Toronto.

OBSERVATIONS AND RECOMMENDATIONS

Based on a review of the available reports, bulk sampling records, abatement records and current investigation/sampling for accessible designated substances in building materials the following are our observations and recommendations.

ASBESTOS

If removal or disturbances of asbestos-containing materials is required, all procedures as defined in Ontario Regulation 278/05 and the University of Toronto Asbestos Control Program, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/> shall be followed. In case of conflict the more stringent procedures shall apply.

Removal of asbestos-containing materials must be conducted by a qualified abatement contractor and all appropriate procedures as detailed in this report and applicable regulations shall be followed.

Representative bulk samples of building materials suspected to contain asbestos were collected following the asbestos bulk sampling procedures prescribed in Code for the Determination of Asbestos by Bulk Samples, dated the 23rd of August 1985 and issued by the Ministry of Labour in O. Reg. 278/05. Any material that contains 0.5 per cent (%) or more asbestos by dry weight is considered to contain asbestos.

A total of three (3) bulk samples of suspect asbestos-containing building materials were collected during the current investigations. All bulk samples were submitted to EMC Scientific Inc. of Mississauga, Ontario, an independent analytical laboratory, for analysis of asbestos type and concentration by Polarized Light Microscopy (PLM) with dispersion staining. A summary of sample results collected during current investigations is presented in Table 1. A copy of laboratory analytical report is presented at Appendix B.

Table 1
Asbestos Bulk Sampling Results Summary

| Sample # | Location | Material | Sample Results |
|-----------------|-----------------|--|--------------------------------|
| 005-210825-1A | Room 5318 | Drywall Joint Compound | None Detected |
| 005-210825-1B | Room 5318 | Drywall Joint Compound | None Detected |
| 005-210825-1C | Room 5318 | Drywall Joint Compound a) White joint compound b) White caulking | None Detected None Detected |

Sprayed Fireproofing

Friable asbestos-containing (Chrysotile) sprayed fireproofing is present on the deck and beams located above the false ceilings in all current project locations.

Friable asbestos-containing (Chrysotile) sprayed fireproofing is present on deck and beams located above false ceilings including doorways and hallways in various other areas throughout the building.

The majority of mechanical chases and risers contain friable asbestos-containing (Chrysotile) sprayed fireproofing present on exposed beams with overspray on walls and piping system.

Friable asbestos-containing sprayed fireproofing and overspray is present in column surrounds of this building, including in the areas where the asbestos fireproofing has been previously abated from the ceilings.

Friable asbestos-containing sprayed fireproofing is suspected to be present at junctions of beams and columns inside the column surrounds of this building, including those areas where the asbestos

fireproofing has been previously abated from the ceilings, unless proven otherwise through available records or further investigations.

Friable asbestos-containing sprayed fireproofing is suspected to be present at locations where block walls adjoin the deck, including those areas where the asbestos fireproofing has been previously abated from the ceilings, unless proven otherwise through available records or further investigations.

Please refer to sprayed fireproofing floor plans for this building, attached at Appendix A. Areas with asbestos-containing fireproofing are shown in yellow; blue hatch identifies areas with non-asbestos fireproofing, whereas no hatch represents concrete deck with no spray fireproofing.

No removal or disturbance of asbestos-containing sprayed fireproofing shall proceed without following appropriate asbestos procedures as listed below.

- Removal of asbestos-containing sprayed fireproofing shall follow Type 2 or Type 3 asbestos abatement procedures based on quantity of materials to be removed [Type 2 procedures if one square meter or less sprayed fireproofing surface area is to be removed. Type 3 procedures if greater than one square meter of sprayed fireproofing surface area is to be removed].
- No ceiling tile removal or other ceiling access is allowed in areas with asbestos-containing sprayed fireproofing. Any ceiling access will require prior approval from the University of Toronto. Any work in the ceiling space by electrical, mechanical or other trades INCLUDING INSPECTIONS in areas with asbestos-containing sprayed fireproofing shall be carried out following Type 2 asbestos procedures (full enclosure with negative air pressure). Workers will need have training for asbestos Type 2 work procedures including valid respiratory fit test certificate.
- Any block wall removal or penetrations that can disturb the top courses (adjoining the deck) shall require appropriate asbestos procedures. Block wall removal or penetrations that are not likely to disturb the top courses of wall can be done as clean demolition.
- Any partition, wall removal or penetrations that can disturb or lift the ceiling tiles in a location with asbestos-containing sprayed fireproofing shall require appropriate asbestos procedures.
- As a requirement of Ontario Regulation 278/05, "cleaning or removing air handling equipment including rigid ducting in a building with asbestos-containing sprayed fireproofing is a Type 3 asbestos work". Please be advised that no ductwork or other air handling equipment is to be removed from ANY location of the building (including previously abated areas) without following appropriate asbestos procedures. Adding any piece of ductwork in a non-asbestos fireproofing area does not require asbestos procedures.
- For entry and any work inside mechanical shafts and risers, the University of Toronto Standard Operating Procedures ID 0.10 and ID R2.10 shall be followed (copies attached at Appendix C).

Vinyl Flooring

Asbestos-containing (Chrysotile) vinyl tiles (non-friable) are present in all current project locations, including under carpets and fixed cabinetry. All vinyl tiles are adhered to the concrete floor with asbestos-containing (Chrysotile) adhesive mastic (non-friable).

All vinyl flooring (non-friable), adhesive mastic (non-friable) and backing paper (friable) in remaining areas of the building shall be considered to contain asbestos unless proven otherwise through available sampling data or by confirmatory sampling.

Asbestos-containing vinyl flooring and mastic are suspected to be present in this building under non-asbestos flooring (carpet, vinyl sheet, wood and non-asbestos floor tiles, etc.)

No removal or disturbance of asbestos-containing vinyl flooring, adhesive mastic and backing paper shall proceed without following appropriate asbestos procedures as listed below.

- Type 2 (full enclosure) asbestos abatement procedures shall be followed for removal of asbestos-containing vinyl floor tiles and mastic. Grinding of asbestos-containing mastic shall follow Type 2 (full enclosure) asbestos procedures if the grinder is equipped with a HEPA vacuum attachment. The procedures shall be elevated to Type 3 if the grinding equipment is not equipped with a HEPA vacuum attachment.
- Type 2 or Type 3 asbestos abatement procedures shall be followed for removal of asbestos-containing vinyl floor sheet and backing paper based on quantity of materials to be removed [Type 2 procedures if one square meter or less area of vinyl flooring and backing paper is to be removed. Type 3 procedures if greater than one square meter of vinyl flooring and backing paper is to be removed].
- Under the University of Toronto Asbestos Management Program, the design or work should not include installing rigid flooring over existing asbestos-containing vinyl floor tiles or sheeting.

Sink Undercoating

Black undercoating on all the sinks present within the current project locations contains non-friable asbestos (Chrysotile).

Sink undercoating present in other areas of the building shall be considered to contain asbestos unless proven otherwise by confirmatory testing or a review of available sampling results.

No removal or disturbance of tar coatings shall proceed without following appropriate asbestos procedures as listed below:

- Type 1 asbestos procedures are required for intact removal of sink applied with tar coating. Removed sink shall be disposed as asbestos waste.
- No cutting, drilling, grinding, sanding, etc. of asbestos-containing tar coating is allowed without following appropriate asbestos procedures. Type 2 asbestos procedures are required if the work is done only by means of non-powered hand-held tools OR if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
- Type 3 asbestos procedures are required for removal of asbestos-containing tar coating if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters.

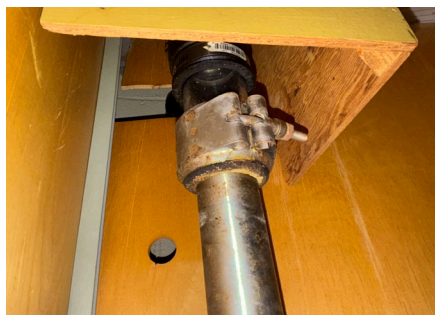
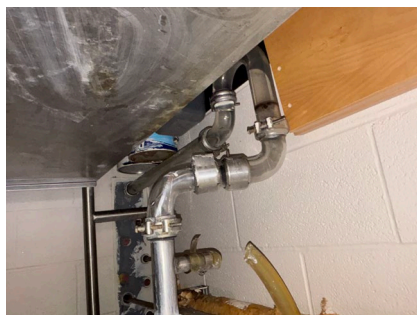
Paper Packing on Drains Fittings/Clamps

Asbestos-containing (friable) paper wrap is present at the hangers supporting the drains as well as pipe clamps at connections inside the cabinets within the current project locations and other areas throughout the building.

The pictures below identify a general view of such material within the building.

No removal or disturbance of this material shall proceed without following appropriate asbestos procedures as listed below:

- Type 2 asbestos procedures are required for removal of paper packing material. Removed material shall be disposed as asbestos waste.



Block Masonry Sealant

Masonry sealant present underneath the paint in the current project locations and the remaining areas of the building shall be considered to contain non-friable asbestos unless proven otherwise by confirmatory testing or a review of available sampling results.

No removal or disturbance of asbestos-containing sealant shall proceed without following one of the following asbestos procedures as appropriate.

- The University of Toronto Standard Operating Procedure ID R1.70, attached at Appendix C, shall be used for disturbance or removal of block masonry wall applied with asbestos-containing sealant underneath the paint, using non-powered hand tools. If working in a public corridor or outside hoarded construction areas, the work must take place inside an asbestos Type 2 enclosure [with negative air pressure] to prevent the spread of construction dust. Bag and dispose all removed cinder blocks as asbestos waste.
- The University of Toronto Standard Operating Procedure ID R2.14, attached at Appendix C, shall be used for disturbance or removal of block masonry wall applied with asbestos-containing sealant underneath the paint, using HEPA filtered power tools. If working in a public corridor or outside hoarded construction areas, the work must take place inside an asbestos Type 2 enclosure [with negative air pressure] to prevent the spread of construction dust. Follow Type 2 asbestos procedures with full enclosure and negative air pressure relative to the areas outside the enclosure if using powered tools with no HEPA filter. Bag and dispose all removed cinder blocks as asbestos waste.
- The University of Toronto Standard Operating Procedure ID R2.13, attached at Appendix C, shall be followed for drilling of holes and removing bolts/screws in masonry wall applied with asbestos-containing sealant underneath the paint.

Drywall Joint Compound

Drywall joint compound on the walls scheduled for removal during this project was sampled during this investigation. The laboratory analytical results identify this material as not to contain asbestos.

All gypsum board and drywall finish in other areas of the building shall be considered to contain non-friable asbestos drywall joint compounds unless proven otherwise through confirmatory sampling.

No removal or disturbance of gypsum board and drywall ceiling/wall finishes applied with asbestos-containing drywall joint compounds shall proceed without following appropriate asbestos procedures as listed below.

- Type 1 or Type 2 (full enclosure) asbestos abatement procedures shall be followed for removal of gypsum board and drywall finishes applied with asbestos-containing drywall joint compounds based on quantity of materials to be removed [Type 1 procedures if one square meter or less area of drywall applied with drywall joint compound is to be removed. Type 2 procedures if greater than one square

meter of drywall area applied with drywall joint compound is to be removed]. Removed drywall shall be disposed as asbestos waste.

- The University of Toronto Standard Operating Procedure ID R2.05, attached at Appendix C, shall be followed for drilling holes in drywall finishes applied with asbestos-containing drywall joint compounds.

Thermal Mechanical Insulation

No asbestos-containing thermal mechanical insulation was observed on accessible piping systems within the current project locations.

All thermal mechanical insulation present above ceiling located in areas with asbestos-containing sprayed fireproofing shall be considered asbestos-contaminated.

Friable asbestos-containing (Chrysotile and Amosite) thermal mechanical insulation is confirmed to be present on mechanical systems, including, but not limited to, heating and plumbing pipe straights, valves, tees, elbows and other fittings below ceiling and within the fixed laboratory millwork in various other areas of the building.

Friable asbestos-containing (Chrysotile and Amosite) thermal mechanical insulation is confirmed to be present on piping systems and other mechanical systems located within the pipe shafts and mechanical risers.

Thermal mechanical insulation on air handling units, ductwork, pumps, tanks, boilers etc. is suspected to contain asbestos throughout this building.

Friable asbestos-containing thermal insulation may exist in presently inaccessible and hidden wall/ceiling/floor penetrations and cavities. Any insulating material identified or discovered in such locations shall be assumed to contain asbestos unless proven otherwise through confirmatory sampling.

No removal or disturbance of asbestos-containing thermal mechanical insulation shall proceed without following appropriate asbestos procedures as listed below.

- Removal of asbestos-containing thermal mechanical insulation shall follow Type 2, Type 2 glove bag or Type 3 asbestos abatement procedures based on quantity and location of materials to be removed [Type 2 procedures for one square meter or less area of asbestos insulation to be removed (inside an enclosure). Type 3 procedures for greater than one square meter of asbestos insulation to be removed (inside an enclosure)].

Ceiling Tiles

All lay-in ceiling tiles present within the current project locations and other areas of the building with asbestos-containing sprayed fireproofing above must be considered contaminated with asbestos.

Non-friable asbestos-containing transite ceiling tiles are present in various other areas of the building which are not part of the current project.

No removal or disturbance of these materials shall proceed without following appropriate asbestos procedures as listed below.

- No ceiling tile removal or other ceiling access is allowed in areas with asbestos-containing sprayed fireproofing. Any ceiling access will require prior approval from the University of Toronto. Any work in the ceiling space by electrical, mechanical or other trades INCLUDING INSPECTIONS in areas with asbestos-containing sprayed fireproofing shall be carried out following Type 2 asbestos procedures (full enclosure with negative air pressure).

- Work of replacement of lay-in ceiling tiles in areas that have asbestos-containing sprayed fireproofing shall require full asbestos Type 2 procedures. Removed ceiling tiles shall be disposed of as asbestos waste.
- No disturbance, cutting, drilling, grinding, sanding, etc. of asbestos transite tiles is allowed without following appropriate asbestos procedures as listed below.
- Type 2 procedures are required for the intact removal and re-installation of transite ceiling tiles from areas that have asbestos-containing sprayed fireproofing. If the transite material is broken, cut, drilled, ground, sanded, etc. Type 3 asbestos procedures must be followed.
- Type 1 procedures are required for the intact removal and re-installation of transite ceiling tiles from areas that contain non-asbestos sprayed fireproofing or no fireproofing spray. If the transite material is broken, cut, drilled, ground, sanded, etc. the more stringent Type 2 or Type 3 asbestos procedures must be followed.
- The University of Toronto Standard Operating Procedure ID R2.04, attached at Appendix C, shall be used for drilling holes (each less than 1/2 inch in diameter) in asbestos transite products.

Plaster

No plaster was observed in the current project locations.

Based on laboratory analytical results of samples of this homogeneous material obtained in the past, and nominal locations with plaster finishes present in the building, all plaster finishes in this building can be considered not to contain asbestos.

However, all plaster ceilings in areas with asbestos-containing sprayed fireproofing above shall be considered asbestos-contaminated.

No removal or disturbance of plaster ceiling in areas with asbestos-containing fireproofing above shall proceed without following appropriate asbestos procedures as listed below:

- No plaster ceiling access is allowed in areas with asbestos-containing sprayed fireproofing. Any ceiling access will require prior approval from the University of Toronto. Any work in the ceiling space by electrical, mechanical or other trades INCLUDING INSPECTIONS in areas with asbestos-containing sprayed fireproofing shall be carried out following Type 2 asbestos procedures (full enclosure with negative air pressure).

Texture Coat/Stucco Finishes

No texture coat/stucco finishes are present in the current project locations.

All texture coat/stucco finishes within the interior and exterior of this building are identified to contain asbestos, unless proven otherwise through confirmatory sampling. Texture coat/stucco is non-friable while in place, however, becomes friable upon removal.

No removal or disturbance of asbestos-containing texture coat/stucco finishes shall proceed without following appropriate asbestos procedures as listed below.

- Type 2 or Type 3 asbestos abatement procedures shall be followed for removal of asbestos-containing texture coat/stucco finishes based on quantity of materials to be removed [Type 2 procedures if one square meter or less texture coat/stucco surface area is to be removed. Type 3 procedures if greater than one square meter of texture coat/stucco surface area is to be removed].

- The University of Toronto Standard Operating Procedure ID R2.04, attached at Appendix C, shall be followed for drilling holes (each less than ½ inch in diameter) in asbestos-containing texture coat/stucco finishes.

Manufactured Asbestos Cement Products (Transite)

Manufactured asbestos cement products (non-friable) in the form of fume hood liner, and fume hood chemical storage cabinet liners are present within the current project locations.

Non-friable asbestos-containing (Chrysotile and Amosite) cement products (Transite) are also present in various other locations of this building and are used as acoustic panels on interior walls, as ceiling tiles, as drainpipes, as countertop sheets, as fumehood liners, as chemical exhaust ducts and as liner inside chemical storage cabinets.

No removal or disturbance of these materials shall proceed without following appropriate asbestos procedures.

- No disturbance, cutting, drilling, grinding, sanding, etc. of asbestos cement products is allowed without following appropriate asbestos procedures.
- Type 2 procedures are required for the intact removal and re-installation of transite ceiling tiles from areas that have asbestos-containing sprayed fireproofing. If the transite material is broken, cut, drilled, ground, sanded, etc. Type 3 asbestos procedures must be followed.
- Type 1 procedures are required for the intact removal and re-installation of transite ceiling tiles from areas that contain non-asbestos sprayed fireproofing or no fireproofing spray. If the transite material is broken, cut, drilled, ground, sanded, etc. the more stringent Type 2 or Type 3 asbestos procedures must be followed.
- Type 1 procedures are required for the intact removal of other asbestos cement products (Transite). If the material is broken, cut, drilled, ground, sanded, etc. the more stringent Type 2 or Type 3 asbestos procedures must be followed.
- The University of Toronto Standard Operating Procedure ID R2.04, attached at Appendix C, shall be used for drilling holes (each less than ½ inch in diameter) in asbestos transite products.

Fire Stop Material

Firestop material (friable) where present at pipe penetrations in walls, ceilings and floors within the current project locations and other areas of the building shall be considered to contain asbestos.

No removal or disturbance of asbestos-containing fire stop material shall proceed without following appropriate asbestos procedures as listed below.

- Removal of asbestos-containing fire stopping shall follow Type 2, or Type 3 (enclosure each side) asbestos abatement procedures based on quantity and location of materials to be removed.

Other

No other accessible building materials suspected to contain asbestos were observed in the current project locations.

Other materials within this building that are confirmed to contain asbestos include:

- Roofing materials.
- Paper behind acoustic wall panels.
- Gaskets in piping systems.

- Gaskets and other internal liners within mechanical and laboratory equipment.
- Gasket in incandescent light fixtures.
- Laboratory materials (gloves, tongs, Bunsen burners etc.).
- Exterior wall panels caulking (where present).
- Paper inside electrical panels.
- Wall ceramic tile grout.
- Door/window frame caulking.

Asbestos-containing materials for which either the sampling records are not available or that are currently hidden or are inaccessible may be present within the building. These materials include:

| | | | |
|---|----------------------------|-------------------------------|----------------------------|
| • Window glazing putty | • Fire rated door liners | • Transite in HV cable trench | • Electrical panel backing |
| • Gaskets and other internal liners within electrical equipment | • Electrical wiring jacket | | |

Investigation including sampling and analysis is recommended in the event of discovery of such materials for determination of presence/absence of asbestos. Appropriate asbestos removal procedures shall be implemented if the material is identified as asbestos containing.

No removal or disturbance of asbestos-containing materials shall proceed without following appropriate asbestos procedures.

LEAD

All paint finishes on walls, structural components, windows, doors, bulkheads, baseboards, floors, ceilings, piping systems, ductwork, mechanical equipment and all other surfaces within the current project locations and other areas of the building shall be assumed to contain lead (any concentration) unless proven otherwise by confirmatory testing.

There is no regulatory limit currently in Ontario that determines what amount of lead in paint constitutes the paint to be considered “lead based paint”. The Environmental Abatement Council of Canada (EACC) – Lead Guideline For Construction, Renovation, Maintenance or Repair (2014) recommends that a content of 0.1% (i.e. 1000 µg/g or 1000 mg/kg or 1000 ppm lead) is considered a “de minimis” or “virtually safe” level of lead in paint or surface coatings, provided that aggressive disturbance or heating does not occur.

The above lead-based paint standards are the generally accepted threshold for defining a “lead-based paint”. These levels are used as action levels where special precautions are typically implemented to contain debris created during construction or renovation activities and to protect workers from exposure during these activities.

The classification, general measures and procedures (or Type of operations) required for removal or disturbance of lead paint, lead painted materials and lead based materials shall depend on the type of work to be conducted, the procedures adopted and the limit of lead in paint accepted by the General Contractor and their sub-contractors.

The General Contractor and their sub-contractors shall follow the requirements as identified in the Ontario Ministry of Labour, Immigration, Training and Skills Development Guidelines for Lead on Construction Projects, available at <https://www.labour.gov.on.ca/english/hs/pubs/lead/> and the University of Toronto Standard Operating Procedures for the Control of Lead During Building Maintenance and Construction Activities, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>. In case of conflict the more stringent procedures shall apply.

Lead-containing wastes should be recycled if practicable or handled and disposed of according to Ontario Regulation 347.

Lead shall also prudently presumed to be present in the following materials:

- As a component of the solder on joints between copper pipe and fittings.
- As a component of the solder on the wire connections of electric components.
- As a component of wool present as caulking in bell fittings at cast iron drains.
- As a component of glazing on spectra glaze blocks and ceramic tiles.
- As a component of lead-acid batteries in emergency lights.
- As lead sheeting.
- As pigmented mortar.
- As lead piping.

MERCURY

Elemental mercury may be present in the electro-thermal switching devices and may be present in trace amount as vapours in metal halide bulbs, fluorescent light tubes and incandescent mercury bulbs in other current project locations and the remainder of the building. It is recommended that at the time of their disposal, all mercury vapour bulbs may be recycled and possibly reused by qualified personnel or may be disposed of according to applicable regulations.

SILICA

Silica-containing materials are present within the current project locations and in other areas throughout the building. Crystalline silica is the primary component of many building materials such as concrete, concrete block, cement, mortar, drywall etc. Silica has also been found as a filler material in insulation. Exposure to airborne crystalline silica can occur when these building materials are disturbed or turned into powder (particularly grinding, drilling or cutting operations and during major demolition).

The General Contractor shall follow work procedures as identified in The Ontario Ministry of Labour Guideline “Silica on Construction Projects” available at <https://www.labour.gov.on.ca/english/hs/pubs/silica/> and The University of Toronto “Crystalline Silica Procedures” available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>. In case of conflict the more stringent procedures shall apply.

The classification, general measures and procedures (or Type of operations) required shall depend on the type of work to be conducted and the procedures adopted by the contractor. The following section outlines the classification of silica containing materials disturbance based on the guideline and procedures referred above.

Type 1 Operations

- Drilling of holes in concrete or rock that is not part of a tunneling operation or road construction.
- Any other operation at a project that requires the handling of silica-containing material in a way that may result in a worker being exposed to airborne silica.
- Entry into a dry mortar removal or abrasive blasting area while airborne dust is visible for less than 15 minutes for inspection and/or sampling.

Type 2 Operations

- Removal of silica containing refractory materials with a jackhammer.
- The drilling of holes in concrete or rock that is part of a tunneling or road construction.
- The use of a power tool to cut, grind, or polish concrete, masonry, terrazzo or refractory materials.
- The use of a power tool to remove silica containing materials.

- Tuckpoint and surface grinding.
- Dry mortar removal with an electric or pneumatic cutting device.
- Dry method dust cleanup from abrasive blasting operations.
- Entry into area where abrasive blasting is being carried out for more than 15 minutes.

Type 3 Operations

- Abrasive blasting with an abrasive that contains ≥ 1 per cent silica.
- Abrasive blasting of a material that contains ≥ 1 per cent silica.

BENZENE

Above ground fuel storage tank is present in the emergency generator location in this building.

- Prior to removal, repair or decommissioning of the tank, the above ground storage tank and its contents (suspected to contain benzene as a fuel component) should be removed and disposed following all applicable Regulations and/or industry standards.

OTHER DESIGNATED SUBSTANCES - Acrylonitrile, Arsenic, Coke Oven Emissions, Ethylene Oxide, Isocyanates and Vinyl Chloride

The building is not and was not used for any process or manufacturing, therefore none of the other Designated Substances listed above are suspected to be present.

CONCLUSION

Based on the information contained in the available asbestos survey reports, abatement records, bulk sampling records and current investigation/sampling; designated substances (Asbestos, Lead, Mercury and Silica) are present in different building materials within the current project locations and other areas of the Medical Sciences Building (Building #005).

Designated substance (Benzene) is present in the emergency generator location of the Medical Sciences Building (Building #005).

NOTE: If additional materials not covered in this report are discovered during the project activities and suspected of containing designated substances, all work that may disturb the material shall be stopped and the Project Manager be contacted to arrange further investigation (i.e., sampling and analysis) to determine the presence of any designated substances.

TRAINING

Any worker who may inadvertently come into contact with any asbestos-containing materials in the course of their work for the current project must have at a minimum Asbestos Awareness Training as outlined in the University of Toronto, Asbestos Management Program, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>.

Workers performing any asbestos work will require appropriate training, including respirator fit testing, as identified in Ontario Regulation 278/05 and the University of Toronto Asbestos Management Program, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>. In case of conflict the more stringent procedures shall apply.

Workers performing removal or disturbance of surfaces applied with lead based paint and lead-containing materials shall have appropriate training, including respirator fit testing, as identified in Ontario Ministry of Labour, Immigration, Training and Skills Development Guidelines for Lead on Construction Projects, available at <https://www.labour.gov.on.ca/english/hs/pubs/lead/> and the University of Toronto Lead Management Program/Standard Operating Procedures for the Control of

Lead During Building Maintenance and Construction Activities, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/> . In case of conflict the more stringent procedures shall apply.

Workers performing removal or disturbance of silica-containing materials shall have appropriate training, including respirator fit testing, as identified in Ontario Ministry of Labour Guideline “Silica on Construction Projects” available at <https://www.labour.gov.on.ca/english/hs/pubs/silica/> and The University of Toronto “Crystalline Silica Procedures” available at <https://ehs.utoronto.ca/resources/policies-and-procedures/> . In case of conflict the more stringent procedures shall apply.

Workers performing removal or disturbance of other hazardous materials shall require appropriate trainings as specified in the relevant regulations/guidelines.

Work will only be allowed once the training certificates of workers working inside asbestos enclosures are verified by the consultants and/or the University of Toronto designated staff.

CLOSURE

The conclusions presented in this report represent the best technical judgment based on the data obtained from the review of available reports, abatement records, bulk sampling records and current investigations of the current project locations during this survey. The conclusions are based on the site conditions at the time the survey was performed at the specific testing and/or sampling locations and can only be extrapolated to an undefined limited area around these locations.

Information provided in this report is intended for the subject project in compliance to the requirements under Section 30 of the Ontario Occupational Health and Safety Act (OHSA), Revised Statutes of Ontario 1990, as amended. Any use by a third party of this report or any reliance by a third party on or decisions made by a third party based on the findings described in this report, is the sole responsibility of such third parties. The University of Toronto F&S Hazardous Construction Materials Group accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

Sincerely,

Prepared By:



Doug Colby, CRSP, AMRT
Senior Inspector
Hazardous Construction Materials Group
University of Toronto
F&S Property Management
Phone: 416-791-9998
doug.colby@utoronto.ca

Reviewed By:

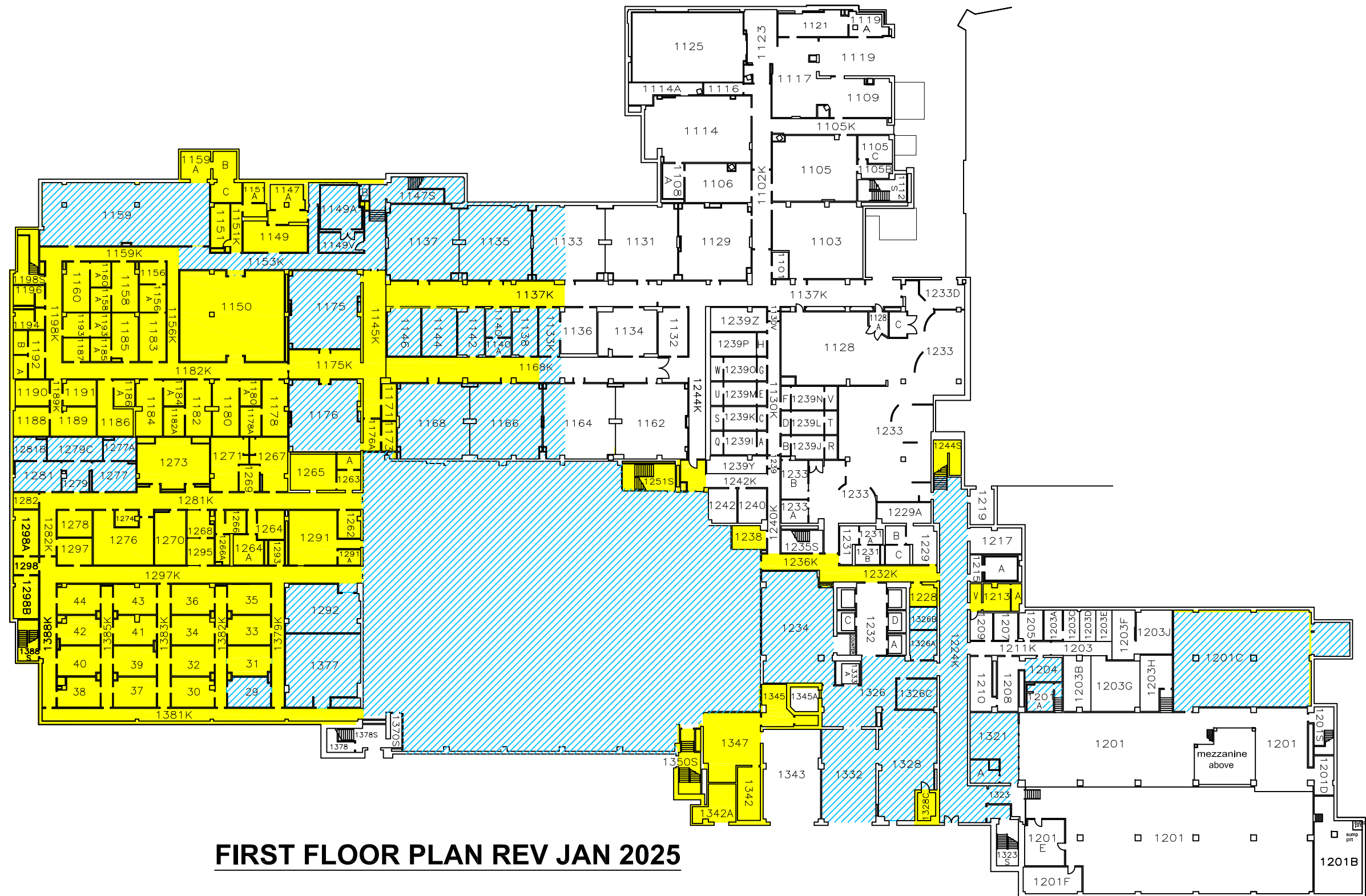


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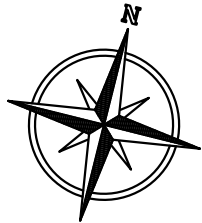


APPENDIX A




Medical Sciences Building Fireproofing Locations Plans



FIRST FLOOR PLAN REV JAN 2025



LEGEND:

-  Asbestos-Containing Fireproofing
-  Non-Asbestos Fireproofing
-  No Fireproofing Present

LOCATION:

**Medical Sciences Building (Building # 005)
1 King's College Circle, Toronto, Ontario**

TITLE:

**Floor Plan Showing the Location of
Asbestos-Containing Sprayed-on-Fireproofing**

DATE:

DRAWN:

CHK'D:



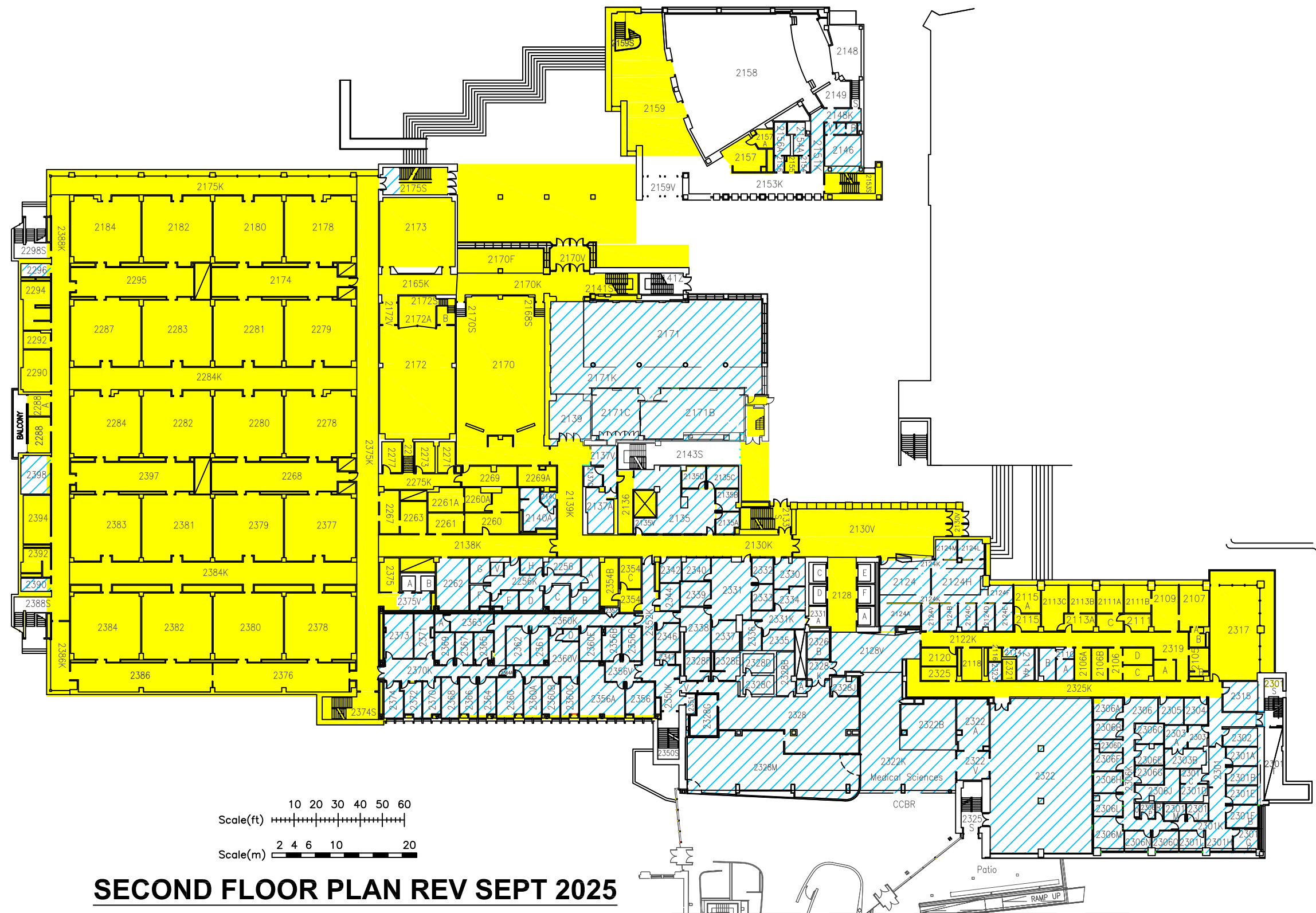
University of Toronto

PROJECT No.

NTS




DRAWING No.

2.1



SECOND FLOOR PLAN REV SEPT 2025

LEGEND:

-  Asbestos-Containing Fireproofing
-  Non-Asbestos Fireproofing
-  No Fireproofing Present

LOCATION:
Medical Sciences Building (Building # 005)
1 King's College Circle, Toronto, Ontario

TITLE: **Floor Plan Showing the Location of
Asbestos-Containing & Non-Asbestos
Fireproofing**

DATE: DRAWN: CHK'D:

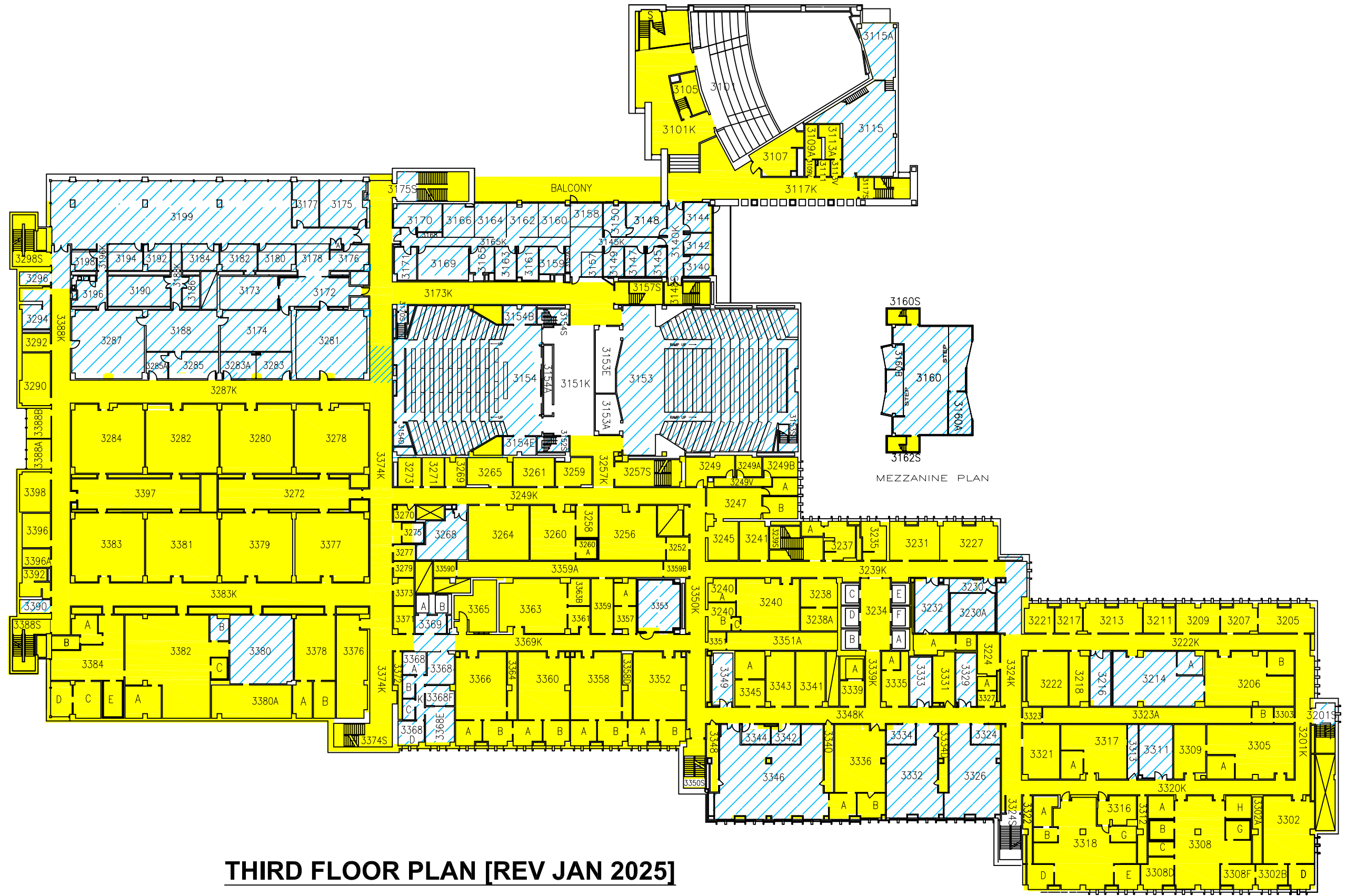


University of Toronto

PROJECT No.

NTS




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THIRD FLOOR PLAN [REV JAN 2025]

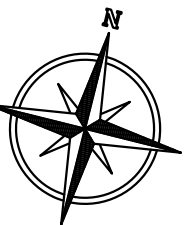


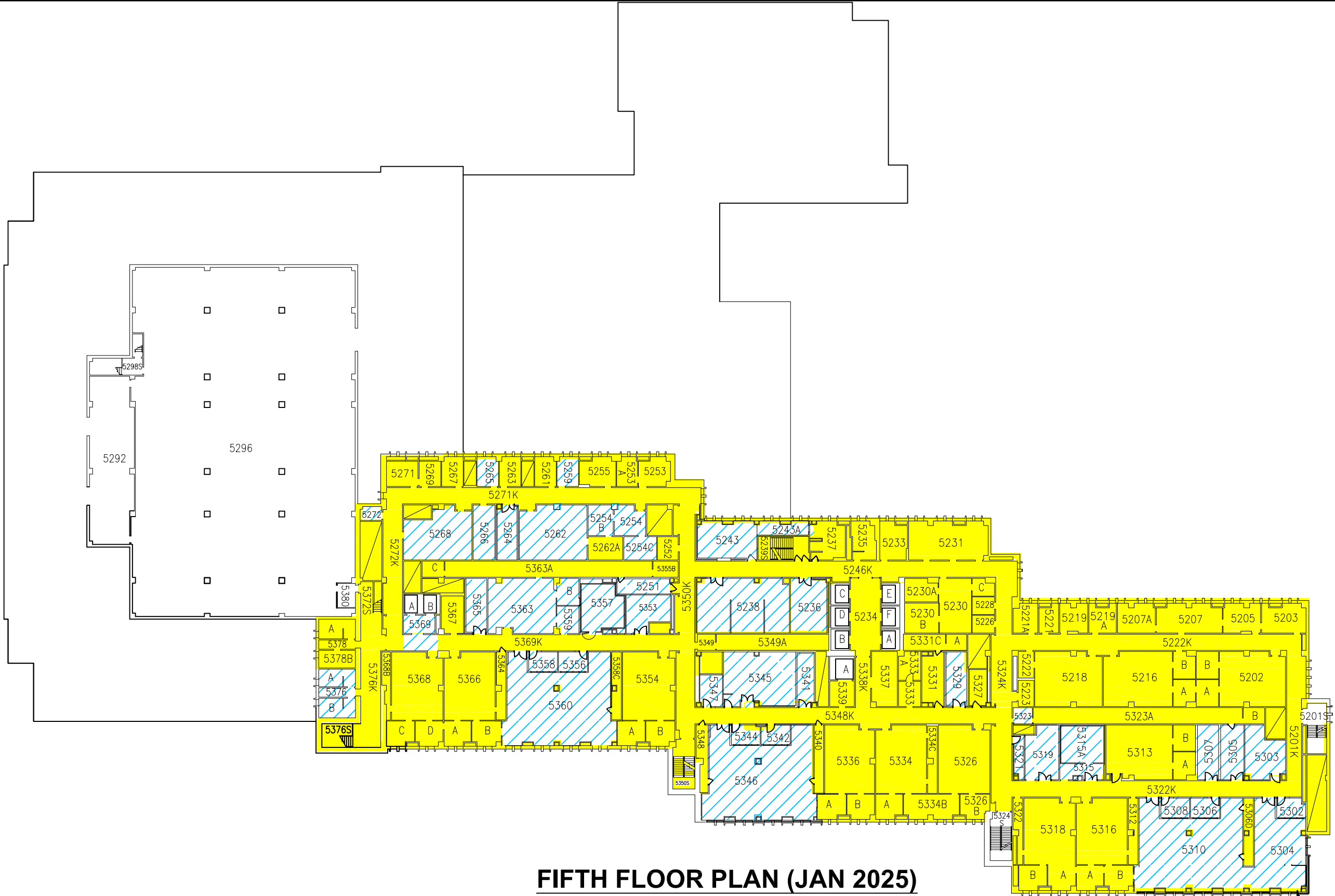
LEGEND:

-  Asbestos-Containing Fireproofing
-  Non-Asbestos Fireproofing
-  No Fireproofing Present

| | | |
|--|--------|--------|
| LOCATION: Medical Sciences Building (Building # 005) 1 King's College Circle, Toronto, Ontario | | |
| TITLE: Floor Plan Showing the Location of Asbestos-Containing Sprayed-on-Fireproofing | | |
| DATE: | DRAWN: | CHK'D: |

| | | |
|---|-------------|------------------------|
|  University of Toronto | PROJECT No. | DRAWING No. 2.3 |
| | NTS | |






FIFTH FLOOR PLAN (JAN 2025)

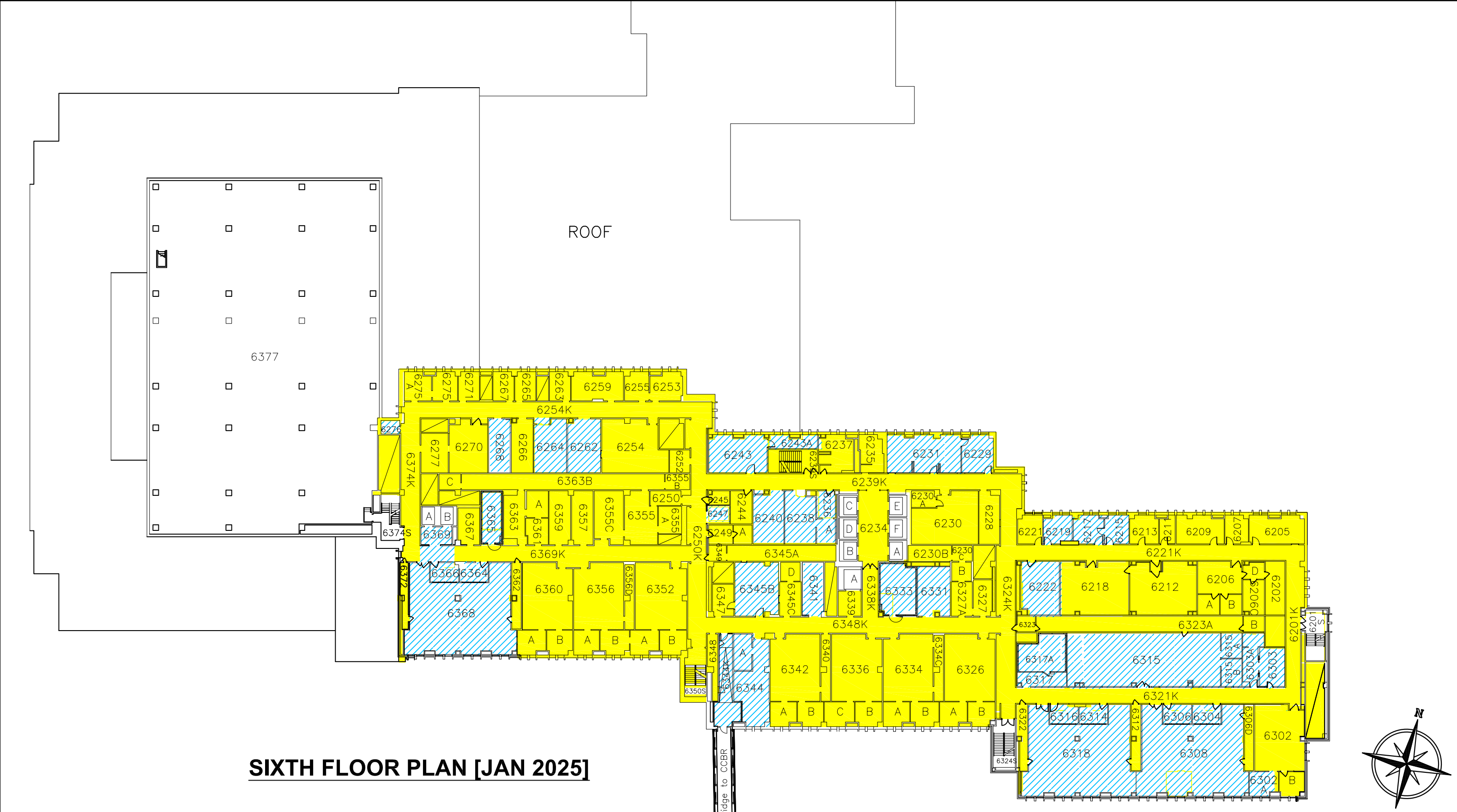



LEGEND:

- Asbestos-Containing Fireproofing
- Non-Asbestos Fireproofing
- No Fireproofing Present

| | | |
|--|--------|--------|
| LOCATION: Medical Sciences Building (Building # 005) 1 King's College Circle, Toronto, Ontario | | |
| TITLE: Floor Plan Showing the Location of Asbestos-Containing Sprayed-on-Fireproofing | | |
| DATE: | DRAWN: | CHK'D: |

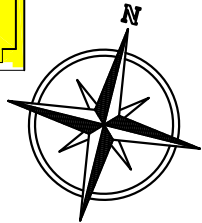
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|  University of Toronto | PROJECT No. | DRAWING No. 2.5 |
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
| | | | | | | | | |
|--|--|--|--|---|---------------|---|--------------------------------------|------------------------|
| LEGEND: <div><div></div>Asbestos-Containing Fireproofing</div> <div><div></div>Non-Asbestos Fireproofing</div> <div><div></div>No Fireproofing Present</div> | | | | LOCATION: Medical Sciences Building (Building # 005) 1 King's College Circle, Toronto, Ontario | |  University of Toronto | PROJECT No. NTS | DRAWING No. 2.6 |
| TITLE: Floor Plan Showing the Location of Asbestos-Containing Sprayed-on-Fireproofing | | | | DATE: | DRAWN: | CHK'D: | | |



SEVENTH FLOOR PLAN [REVISED JAN 2025]



LEGEND:

-  Asbestos-Containing Fireproofing
-  Non-Asbestos Fireproofing
-  No Fireproofing Present

LOCATION:

Medical Sciences Building (Building # 005)
1 King's College Circle, Toronto, Ontario

TITLE:

Floor Plan Showing the Location of
Asbestos-Containing Sprayed-on-Fireproofing

DATE:

DRAWN:

CHK'D:



University of Toronto

PROJECT No.

NTS

DRAWING No.



APPENDIX B

Copy of Laboratory Analytical Results

Laboratory Analysis Report

To:

Doug Colby
University of Toronto
Environmental Health & Safety
215 Huron Street, 7th Floor
Toronto, Ontario
M5S 1A1

EMC LAB REPORT NUMBER: A124276

Project Name: MSB (005)

Analysis Method: Polarized Light Microscopy – EPA 600

Date Received: Aug 25/25

Date Analyzed: Aug 25/25

Analyst: Rahul Patel

Reviewed By: Malgorzata Sybydlo

Project No: 1116691

Number of Samples: 3

Date Reported: Aug 25/25

| Client's Sample ID | Lab Sample No. | Description/Location | Sample Appearance | SAMPLE COMPONENTS (%) | | |
|--------------------|----------------|-----------------------------------|---|-----------------------|---------------------|----------------------|
| | | | | Asbestos Fibres | Non-asbestos Fibres | Non-fibrous Material |
| 005-210825-1A | A124276-1 | Room 5318/ drywall joint compound | White, joint compound | ND | | 100 |
| 005-210825-1B | A124276-2 | Room 5318/ drywall joint compound | White, joint compound | ND | | 100 |
| 005-210825-1C | A124276-3 | Room 5318/ drywall joint compound | 2 Phases: a) White, joint compound b) White, caulking | ND ND | | 100 100 |

Note:

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



APPENDIX C

**University of Toronto Standard Operating Procedure ID 0.10, R2.10,
R2.04, R2.05, R1.70, R2.13 and R2.14**



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Non-Asbestos Work in Chases (Shafts)

ID 0.10

**ENTRY INTO MECHANICAL CHASES (SHAFTS)
IN BUILDINGS WITH ASBESTOS-CONTAINING SPRAYED FIREPROOFING**

This section addresses entry and non-asbestos work performed in mechanical chases where asbestos-containing sprayed fireproofing is exposed and present, and where overspray may be present on horizontal and vertical surfaces. If there is damaged asbestos material, report to your supervisor and contact Facilities and Services, Hazardous Construction Materials Group (HCMG) for repair/clean-up. Do not proceed with work until repair/clean-up has been completed.

1.0 APPLICATION

1.1 Certain work activities can be performed by entering into these chases without the requirement for asbestos precautions as long as no asbestos material is being disturbed or damaged. These activities are:

- Entry into and moving through the chase.
- Turning valves, switches, work on electrical panels/equipment etc. if not contaminated with asbestos.
- Inspection, checking metres, reading instruments etc.
- Work on shaft doors and associated locks where no asbestos contamination or materials are present*.

When performing the above, do not disturb any asbestos material, including sprayed fireproofing or overspray on structure and cross bracing. It should be noted that storing items in these spaces is discouraged.

1.2 General reminders:

- Prior to walking in the area and before beginning work, conduct a quick visual inspection. Report any fallen debris/potential sprayed asbestos fireproofing to your supervisor and arrange for clean up following asbestos procedures prior to continuing work.
- Before starting work, inspect the equipment you will be working on (e.g. electrical panel, conduit, cable, valve, switch, etc.) and whether there is any potential for disturbing asbestos. Be aware of working close to the ceiling where asbestos sprayed fireproofing may be present and be accidentally disturbed during the work. Follow appropriate Type 2 procedures if there is potential for disturbance. Speak to your supervisor if you have any concerns.

1.3 Any "work" in a mechanical chase, not described above, is considered asbestos disturbance and Type 2 or 3 procedures, as outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act, must be followed.

1.4 Removal or disturbance of less than 1 square metre of friable material is a Type 2 Procedure. Please refer to U of T SOP ID R2.10 for detailed instructions on the appropriate procedure to follow. The requirements of SOP ID R2.10 apply except for the requirement for an enclosure.

1.5 Removal or disturbance of more than 1 square metre of friable material is a Type 3 Procedure. Type 3 asbestos work requires additional training and is conducted by external asbestos contractors only. Contact HCMG if Type 3 work is required.

1.6 *For fire-rated doors with friable asbestos-containing core materials, the door itself contains asbestos; refer to SOP R1.50 or SOP 2.50 where applicable and appropriate.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 1 Operations

ID R1.70

DEMOLISHING CINDERBLOCK WALL WITH ASBESTOS-CONTAINING COATING USING HAND TOOL

1.0 APPLICATION

- 1.1 This procedure applies to demolishing cinderblock walls with asbestos-containing coating using hand tools such as sledge hammers. This work is classified as a Type 1 operation (Section 12(3)8 of 278/05).
- 1.2 Disturbance of this material using power tools is a Type 2 procedure – refer to R2.13 (drilling only) or R2.14 (breaking, cutting, abrading, grinding, sanding or vibrating).

2.0 DEFINITIONS

- 2.1 *Damp-Wiping:* A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.
- 2.2 *Work Areas:* Where actual work activity involving asbestos takes place.

3.0 MATERIALS AND EQUIPMENT

- 3.1 *HEPA Vacuum:* Vacuum cleaner equipped with a High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 *Dropsheet:* Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.3 *Amended Water:* A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.
- 3.4 *Sprayer:* Sprayer with mist nozzle for application of amended water or sealant.
- 3.5 *Asbestos Waste Receptacles:* Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.
- 3.6 *Small Tools:* Sponge(s), bucket(s), ladder, etc.
- 3.7 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene bags.
- 3.8 *Respirator:* Respirators are optional. See section 4.2.
- 3.9 *Coveralls:* Full body disposable clothing of an appropriate size with attached hood. It should be elasticized at the cuffs and hood, and be made of material which does not readily retain or permit penetration of asbestos fibres.

- 3.10 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.

4.0 PERSONAL PROTECTION

- 4.1 While not mandatory, workers are strongly advised to wear respirators.
- 4.2 If a worker requests a respirator; the following shall apply:
- 4.2.1 All respiratory equipment shall be individually assigned and identified.
- 4.2.2 Each worker must attend respiratory protection training and be fit tested prior to beginning work.
- 4.2.3 Workers shall wear at least a half facepiece respirator fitted with purple HEPA (P100) filters.
- 4.2.4 Disposable single-use type respirators are not permitted.
- 4.2.5 All respirators shall be approved and labelled for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
- 4.2.6 Replace filter cartridges as appropriate (36 hours of use or more frequently).
- 4.3 Due to general construction dust, workers must wear disposable coveralls:
- 4.4 A worker who is provided with protective clothing shall, before leaving the work area:
- 4.4.1 Decontaminate his or her protective clothing and footwear by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
- 4.4.2 If the protective clothing will not be reused, place it in an asbestos waste receptacle.
- 4.5 Eye protection and safety shoes must be worn for this task.
- 4.6 Facilities for washing hands and face must be provided and shall be used by every worker when leaving asbestos work areas.
- 4.7 Smoking, eating, drinking or chewing in asbestos work areas is prohibited.

5.0 PREPARATION - WORK AREAS

- 5.1 While it is not necessary to post signs for a Type 1 operation, it is a good practice to prevent others from entering the immediate vicinity of the work area.
- 5.2 When people are still in the area where work is to be done the Type I "Minor Asbestos Work Description" (last page of this SOP) should be filled out and distributed to anyone likely to be near the work being carried out.
- 5.3 Before beginning work, remove any visible dust from the work area by HEPA vacuuming or damp wiping.
- 5.4 Before beginning work, wherever practicable, cover floor below the work with polyethylene drop-sheets to catch debris.
- 5.5 Type 1 asbestos work does NOT require the use of enclosures. If working in a public corridor or outside a hoarded construction areas, the work must take place inside an asbestos Type 2 enclosure [with negative air pressure] to prevent the spread of construction dust.

6.0 EXECUTION

- 6.1 Use only hand-held non-powered tools. Do not use compressed air.

- 6.2 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material.
- 6.3 No power tools are allowed.
- 6.4 Outline the area to be demolished with a coloured pencil or marker.
- 6.5 Before using hammer or other large hand tools, check nearby surrounding. Other nearby workers or objects may be struck by the swing of the hammer or hand tool. Swing and move the tool only if there is sufficient space to prevent injury to others and/or unwanted damage.
- 6.6 Strike or hit the desired area with the hammer. Repeat as required.
- 6.7 On completion of work, clean all surfaces, tools, equipment, and work shoes by HEPA vacuuming or by damp wiping. Drop-sheets and used cleaning cloths must be wetted and disposed of as asbestos waste. Double bag all waste and dispose of as described in section 7.1.

7.0 WASTE TRANSPORT AND DISPOSAL

- 7.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 7.2 *For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.
- 7.3 Cinderblock waste with asbestos-containing coating must be disposed of as asbestos waste.

APPENDIX A: MINOR ASBESTOS WORK DESCRIPTION (TYPE 1)

Date: _____ Start time: _____ Stop time (approx.): _____

Building: _____

Brief Work Description: _____

Supervisor of work party: _____

Name of Contractor or Trade: _____

Property or Project Manager: _____

Please note that workers that work on a daily basis with asbestos may be wearing respiratory protection and protective coveralls when working in an area where U of T employees, students or Faculty are present in their normal work clothes. This personal protective equipment (PPE) is optional for this kind of work under the asbestos regulations, but may be requested by the asbestos worker if desired. Asbestos workers wear this PPE because they are closer to the work being carried out, and are thus exposed at a much higher level than bystanders. In addition they are exposed to asbestos on a daily basis, and may wish to ensure that their total exposure is as low as possible. U of T employees in the area are not exposed on a daily basis, and thus are not subjected to the same level of risk. Please see the section on non-occupational exposure for more details.

ASBESTOS WORK

University employees as well as contractors are sometimes required to conduct work that involves the disturbance of asbestos-containing materials. Such work activities are strictly regulated. They are first categorized into three types of work operations - **Type 1 (low risk – the type covered by this form)**, Type 2 (moderate risk) or Type 3 (high risk). For each of these, the Asbestos Management Program designates corresponding standard operating procedures to prevent the exposure to airborne asbestos. These procedures include strict requirements for preparation of the work area, use of personal protective equipment, use of proper work practices to reduce the spread of asbestos fibres, personal hygiene practices, and asbestos waste handling.

NON-OCCUPATIONAL EXPOSURE

Asbestos-specific diseases are almost always a result of occupational exposure to asbestos. Non-occupational exposures resulting in disease have only been seen in spouses or other family members living with an asbestos worker, or those who have lived in the neighbourhood of asbestos plants.

Asbestos fibres are naturally occurring and result in a natural background present in our environment. This combined with the widespread use of asbestos in products such as truck brake linings, means that we are all exposed to very small amounts of asbestos in our daily lives. It is not this very low level of exposure that results in asbestos disease but the higher levels of occupational exposure that are of concern to most authorities. Studies have not shown any evidence of asbestos-specific diseases in individuals who breathe asbestos in the outdoor air or who inhale asbestos as occupants of asbestos-containing buildings. Regardless, proper measures for preventing or minimizing exposure to asbestos must always be in place.

If you have any questions about the work being conducted, then please contact the Property Manager or Project Manager listed above.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.04

**DRILLING ASBESTOS CONTAINING MATERIALS (E.g. plaster, mastics, textured boards, stucco, etc.) WITH A
HEPA FILTERED POWER TOOL**

The exposure of workers and the corresponding measures and procedures for the drilling of holes in friable asbestos-containing material are classified as Type 2.

When authorized workers conduct Type 2 activities involving the clean-up of friable asbestos-containing material, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the methods in Ontario Ministry of Labour, Regulations Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Reg. 278/05) and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

- 1.1 These procedures apply to the drilling of holes (each less than ½ inch in diameter) in the asbestos-containing plaster application for the sole purpose of attaching fasteners for wall hangings and the like. This activity may generate enough airborne asbestos to require protective equipment, but is of short duration.

2.0 DEFINITIONS

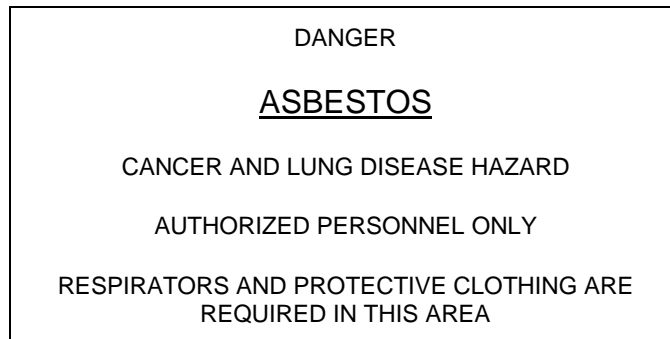
- 2.1 *Work Areas:* Where actual work activity involving friable asbestos takes place.
- 2.2 *Damp Wiping:* A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 MATERIALS AND EQUIPMENT

- 3.1 *HEPA Vacuum:* Vacuum cleaner equipped with High Efficiency Particulate Arresting HEPA Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 *HEPA Filtered Tool:* A tool that has been manufactured specifically for the intended purpose and equipped with a filtering system that meets the same definition for filter efficiency as in Item 3.1.
- 3.3 *Dropsheet:* Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.4 *Amended Water:* A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.
- 3.5 *Sprayer:* Sprayer with mist nozzle for application of amended water or sealant.
- 3.6 *Asbestos Waste Receptacles:* Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area.

Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.

- 3.7 *Small Tools:* Sponge(s), metal bristle brush(es), bucket(s), ladder(s), heavy duty scraper(s), etc.
- 3.8 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene to all surfaces to be covered.
- 3.9 *Respirator:* See section 5 Personal Protective Equipment.
- 3.10 *Coveralls:* Full body disposable clothing of appropriate with attached hood and elasticized at cuffs and hood, made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.11 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.12 *Signage:* Warning of asbestos hazard in the work area:



4.0 NOTICE OF ASBESTOS WORK

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities involving friable asbestos. The following methods of communication apply:

- 4.1 The notification is to include a description of the planned Type 2 activity, its proposed duration, and in general terms the precautionary measures required to maintain a safe work environment. This information is to be provided to the following parties.
 - 4.1.1 All appropriate Directors (St. George, UTM, UTSC, Capital Projects)
 - 4.1.2 Manager, Environmental Hazards and Safety (St. George only)
 - 4.1.3 Director, Environmental Health and Safety
 - 4.1.4 Co-chairs of both the Trades and the Utilities Joint Health and Safety Committees
 - 4.1.5 Co-chairs, Local Joint Health and Safety Committee
 - 4.1.6 Local Area Occupants
- 4.2 Signage at Work Location
 - 4.2.1 This sign informs building users of the asbestos-related work being conducted at that work location and that entry into the area is restricted to authorized personnel only. Signs are to be posted in the work area in sufficient numbers to warn of the hazard.

5.0 PERSONAL PROTECTION

- 5.1 *Respirators:* Workers are required to don respirators when performing Type 2 work. The following shall apply:
 - 5.1.1 All respiratory equipment shall be individually assigned and identified.
 - 5.1.2 Each worker must be instructed and tested with his/her respirator.

- 5.1.3 Workers shall wear at least a half-face piece air-purifying respirator fitted with HEPA (P100) filters (material wetted). If the material cannot be wetted, a full face air-purifying respirator is required. All respirators shall be approved and labelled for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
- 5.1.4 Replace filter cartridges as appropriate (36 hours of use or more frequently). Dispose of used cartridges as asbestos waste.
- 5.1.5 No supervisor or worker shall have facial hair which affects respirator-to-face seal.
- 5.2 *Protective Clothing:* All workers must be provided with full body disposable coverall and shoe covers as described in Section 3.
- 5.3 *Facilities:* Provide facilities for washing hands and face which shall be used by every worker when leaving asbestos work areas.
- 5.4 *Practice:* Workers shall not eat, drink, smoke or chew while in contaminated work areas.
- 5.5 *Work Area Entry:* All persons shall don respirators with HEPA (P100) filters and clean coveralls before entering work area.
- 5.6 *Work Area Exit:* Before leaving the Work Area and still wearing a respirator, a worker shall:-
 - 5.6.1 Thoroughly HEPA vacuum protective clothing, respirator and footwear.
 - 5.6.2 Remove decontaminated coveralls and wash hands and face with water (in Work Area).
 - 5.6.3 Leave the Work Area in street clothes and proceed to the nearest washroom to wash hands and face.
 - 5.6.4 Coveralls may be reused throughout a day provided they are disposed of after each shift, or left inside the Work Area after each use.

6.0 PREPARATION - WORK AREAS

- 6.1 Do not use compressed air.
- 6.2 Clear immediate work areas of all moveable furnishings or equipment.
- 6.3 Erect tape barriers to keep all non-protected personnel at least 30 feet away. Post signs warning of asbestos hazard at tape barrier (see Appendix).
- 6.4 An enclosure is not necessary for this activity. As appropriate, a drop-sheet below the work is required; extend the drop-sheet at least 3 feet beyond line of work. Use rip-proof polyethylene if work is above rough concrete or other surface that could tear polyethylene.
- 6.5 When drilling friable asbestos materials (e.g. plaster), shut down all ventilation to and from the work area. As appropriate, seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting.
- 6.6 When drilling non-friable asbestos materials (e.g. mastic, textured boards, etc.), a ventilation shut down is not required. However, as appropriate, seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting.
- 6.7 Post signs warning of asbestos hazard at the entrances to the work area
- 6.8 Don respiratory equipment and coveralls as described above.

7.0 EXECUTION

- 7.1 Do not use compressed air.
- 7.2 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.3 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material

- 7.4 Drill using a power tool attached to HEPA dust collection following manufacturer's instructions.
- 7.5 Repeat steps above for each additional proposed drilling location.
- 7.6 At completion of work, HEPA vacuum or wet wipe the drop-sheet, tools and equipment.
- 7.7 Any polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste..

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually rip-proof polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 *For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.05

**DRILLING OF HOLES IN WALL WITH ASBESTOS JOINT DRYWALL COMPOUND
WITH A HEPA FILTERED POWER TOOL**

The exposure of workers and the corresponding measures and procedures for the minor disturbance of friable asbestos are classified as Type 2.

When authorized workers conduct Type 2 activities involving the minor disturbance of friable asbestos, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the requirements outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

- 1.1 These procedures apply to the drilling of holes in walls that contain asbestos drywall joint compound. Asbestos drywall joint compound is a non-friable asbestos-containing material.
- 1.2 Where possible, the use of hand tools to drill in drywall with asbestos drywall joint compound should be encouraged. The use of hand tools (instead of power tools) combined with the wetting down of materials will result in less airborne fibres and Type 1 procedures can be followed. See procedure R1.00 Non-Friable Asbestos Disturbance.
- 1.3 The procedures follow the methods in Ontario Ministry of Labour, Regulations Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Reg. 278/05) and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

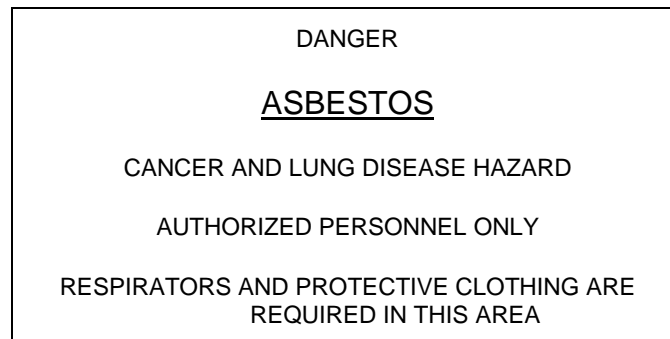
2.0 DEFINITIONS

- 2.1 *Work Areas:* Where actual work activity involving non-friable asbestos takes place.
- 2.2 *Damp Wiping:* A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 MATERIALS AND EQUIPMENT

- 3.1 *HEPA Vacuum:* Vacuum cleaner equipped with High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 *HEPA Filtered Tool:* A tool that has been manufactured specifically for the intended purpose and equipped with a filtering system that meets the same definition for filter efficiency above.
- 3.3 *Drop-sheet:* Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.4 *Amended Water:* A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.

- 3.5 *Sprayer:* Sprayer with mist nozzle for application of amended water or sealant.
- 3.6 *Asbestos Waste Receptacles:* Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.
- 3.7 *Small Tools:* Sponge(s), metal bristle brush(es), bucket(s), ladder(s), heavy duty scraper(s), etc.
- 3.8 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene to all surfaces to be covered.
- 3.9 *Respirator:* See section 5 Personal Protective Equipment.
- 3.10 *Coveralls:* Full body disposable clothing of an appropriate size with attached hood and elasticized at cuffs and hood, made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.11 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.12 *Signage:* Warning of asbestos hazard in the work area:



4.0 NOTICE OF ASBESTOS WORK

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities. Where this work is part of a larger construction project, follow communications protocols for projects which are more broad and may include notifications to a large group of building occupants and relevant directors in Facilities Management (UTM and UTSc), Facilities Services (St. George) and EHS.

- 4.1 The notification is to include a description of the planned Type 2 activity, its proposed duration, and in general terms the precautionary measures required to maintain a safe work environment. This information is to be provided to the following:
- 4.1.1 Local area occupants (see Appendix I – The notification template in Appendix I can be handed to the occupants during emergency repairs, etc. or as part of an email communication when scheduling the work with the occupants. An email template version is available from EHS.).
- 4.1.2 Where appropriate, Manager, Hazardous Construction Materials Group (St. George only)
- 4.2 Signage at Work Location
- 4.2.1 This sign informs building users of the asbestos-related work being conducted at that work location and that entry into the area is restricted to authorized personnel only. Signs are to be posted in the work area in sufficient numbers to warn of the hazard.

5.0 PERSONAL PROTECTION

- 5.1 *Respirators:* Workers are required to don respirators when performing Type 2 work. The following shall apply:

- 5.1.1 All respiratory equipment shall be individually assigned and identified.
- 5.1.2 Each worker must be instructed and fit tested with his/her respirator.
- 5.1.3 Workers shall wear at least a half-face piece air-purifying respirator fitted with HEPA (P100) filters (material wetted). If the material cannot be wetted, a full face air-purifying respirator is required.
- 5.1.4 Disposable single-use type respirators are not permitted.
- 5.1.5 All respirators shall be approved and labelled for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
- 5.1.6 Replace filter cartridges as appropriate (36 hours of use or more frequently). Dispose of used cartridges as asbestos waste.
- 5.1.7 No supervisor or worker shall have facial hair which affects respirator-to-face seal.
- 5.2 *Protective Clothing:* All workers must be provided with full body disposable protective clothing (coveralls), extra large size with attached hood and elasticized at the cuffs and hood, made of material which does not readily retain nor permit penetration of asbestos fibres.
- 5.3 *Facilities:* Provide facilities for washing hands and face which shall be used by every worker when leaving asbestos work areas.
- 5.4 *Practice:* Workers shall not eat, drink, smoke or chew while in contaminated work areas.
- 5.5 *Work Area Entry:* All persons shall don respirators with HEPA (P100) filters and clean coveralls before entering work area.
- 5.6 *Work Area Exit:* Before leaving the Work Area and still wearing a respirator, a worker shall:-
 - 5.6.1 Thoroughly HEPA vacuum protective clothing, respirator and footwear.
 - 5.6.2 Remove decontaminated coveralls and wash hands and face with water (in Work Area).
 - 5.6.3 Leave the Work Area in street clothes and proceed to the nearest washroom to wash hands and face.
 - 5.6.4 Coveralls may be reused throughout a day provided they are disposed of after each shift, or left inside the Work Area after each use.

6.0 PREPARATION - WORK AREAS

- 6.1 Do not use compressed air.
- 6.2 Clear immediate work areas of all moveable furnishings or equipment.
- 6.3 Erect tape barriers to keep all non-protected personnel at least 20 feet away. Post signs warning of asbestos hazard at tape barrier (see Signage in Section 3).
- 6.4 An enclosure is not necessary for this activity. As appropriate, a drop-sheet below the work is required; extend the drop-sheet at least 3 feet beyond line of work. Use rip-proof polyethylene if work is above rough concrete or other surface that could tear polyethylene.
- 6.5 Seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting. No ventilation shutdown is required.
- 6.6 Post signs warning of asbestos hazard at the entrances to the work area
- 6.7 Don respiratory equipment and coveralls as described above.

7.0 EXECUTION

- 7.1 Do not use compressed air.
- 7.2 Wet (with amended water) any asbestos-containing material in the vicinity.

- 7.3 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.4 Drill using a power tool physically attached to HEPA dust collection following manufacturer's instructions. Alternatively, use the power drill with the Bitbuddie Dust Shroud attachment and connect to a HEPA vacuum to collect dust. The alternative Bitbuddie method should only be used on asbestos drywall joint compound is within 0.5-5% dry weight per sampling results.
- 7.5 With the HEPA filtration operating, begin the drilling process by positioning the operating drill bit at the proposed drilling location and carefully applying gentle force on the drill while the drill bit **slowly** produces a "**clear-cut**" hole in the wall; remove the tool about 5 seconds after the hole is drilled.
- 7.6 Repeat steps above for each additional proposed drilling location.
- 7.7 At completion of work, HEPA vacuum or wet wipe the drop-sheet, any other surfaces below the work area, tools and equipment.
- 7.8 Any polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste.

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually rip-proof polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 *For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.
- 8.3 Drywall containing asbestos drywall joint compound must be disposed of as asbestos waste.

Appendix I

Notification of Type 2 Asbestos Work for SOP 2.05 Drilling of Holes in Wall with Asbestos Drywall Joint Compound with a HEPA Filtered Power Tool (no ventilation shutdown required).

*****Please forward to all applicable occupants in or near the affected room(s).*****

Date: _____ Start time: _____ Stop time (approx.): _____

Building: _____ Room: _____

Brief Work Description: _____

Name of Contractor or Trade: _____ Phone number: _____

Property or Project Manager: _____ Phone number: _____

Please note that workers that work on a daily basis with asbestos may be wearing respiratory protection and protective coveralls when working in an area where U of T employees, students or Faculty are present in their normal work clothes. Asbestos workers wear this PPE because they are closer to the work being carried out, and are thus exposed at a much higher level than bystanders. In addition, they perform asbestos work on a routine, and may wish to ensure that their total exposure is as low as possible. U of T employees in the area are not exposed on a daily basis, and thus are not subjected to the same level of risk. Please see the section on non-occupational exposure for more details.

ASBESTOS WORK

University employees as well as contractors are sometimes required to conduct work that involves the disturbance of asbestos-containing materials. Such work activities are strictly regulated. They are first categorized into three types of work operations - Type 1 (low risk), Type 2 (moderate risk) or Type 3 (high risk). For each of these, the Asbestos Management Program designates corresponding standard operating procedures to prevent the exposure to airborne asbestos. These procedures include strict requirements for preparation of the work area, use of personal protective equipment, use of proper work practices to reduce the spread of asbestos fibres, personal hygiene practices, and asbestos waste handling.

NON-OCCUPATIONAL EXPOSURE:

Asbestos-specific diseases are almost always a result of occupational exposure to asbestos. Non-occupational exposures resulting in disease have only been seen in spouses or other family members living with an asbestos worker, or those who have lived in the neighbourhood of asbestos plants. Asbestos fibres are naturally occurring and result in a natural background present in our environment. This combined with the widespread use of asbestos in products such as truck brake linings, means that we are all exposed to very small amounts of asbestos in our daily lives. It is not this very low level of exposure that results in asbestos disease but the higher levels of occupational exposure that are of concern to most authorities. Studies have not shown any evidence of asbestos-specific diseases in individuals who breathe asbestos in the outdoor air or who inhale asbestos as occupants of asbestos-containing buildings. Regardless, proper measures for preventing or minimizing exposure to asbestos must always be in place.

If you have any questions about the work being conducted, then please contact the Property Manager or Project Manager listed above.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.10

MINOR FRIABLE ASBESTOS REMOVAL

The exposure of workers and the corresponding measures and procedures for the minor disturbance of friable asbestos are classified as Type 2.

When authorized workers conduct Type 2 activities involving the minor disturbance of friable asbestos, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the requirements outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

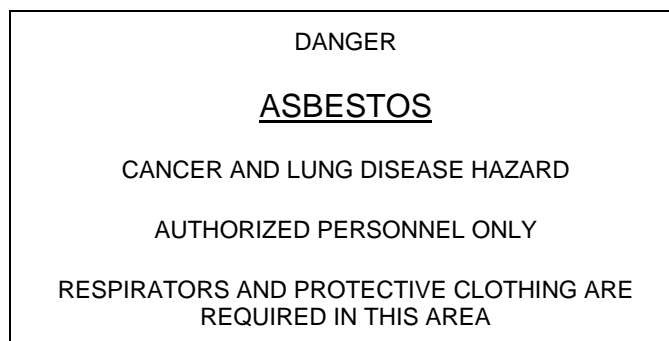
- 1.1 These procedures apply to all work involving the minor removal of friable asbestos-containing material; this activity may generate enough airborne asbestos to require protective equipment, but is of short duration..
- 1.2 Minor removal of material containing asbestos means the removal of **one square meter or less of wet friable material**, including mechanical insulation, sprayed fireproofing and texture plaster. The length of insulated pipe corresponding to the maximum allowable one square metre (10.76 square feet) of insulation may be determined by the following equation:
 - 1.2.1 $\text{Area (outer surface of insulated pipe in sq. ft.)} = \text{Length (of insulated pipe in ft.)} \times 2\pi R$ (or $2 \times 3.14 \times R$ where R = Radius of pipe and insulation).
- 1.3 Work on friable asbestos-containing material is classified according to the total area on which work is done consecutively in a room or enclosed area, even if the work is divided into smaller jobs. O. Reg. 278/05, s. 12 (5). Therefore a project that would be a Type 3 project (removal of more than 1 square metre in a room or area) cannot be broken into smaller amounts in order to be done as a series of Type 2 projects.

2.0 DEFINITIONS

- 2.1 *Work Areas:* Where actual work activity involving asbestos takes place.
- 2.2 *Enclosure:* An impermeable barrier made of rip-proof polyethylene plastic or similar material, inside which the asbestos activity takes place.
- 2.3 *Damp Wiping:* A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 **MATERIALS AND EQUIPMENT**

- 3.1 *HEPA Vacuum:* Vacuum cleaner equipped with a High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 *Dropsheet:* Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.3 *Encapsulant (Sealer):* Bonding agent or sealant which can be applied as a liquid and controls the release of fibres or dust from the surface.
- 3.4 *Amended Water:* A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.
- 3.5 *Sprayer:* Sprayer with mist nozzle for application of amended water or sealant.
- 3.6 *Asbestos Waste Receptacles:* Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.
- 3.7 *Small Tools:* Sponge(s), bucket(s), ladder, etc.
- 3.8 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene bags.
- 3.9 *Respirator:* See section 5 Personal Protective Equipment.
- 3.10 *Coveralls:* Full body disposable clothing of an appropriate size with attached hood. It should be elasticized at the cuffs and hood, and be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.11 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.12 *Signage:* Warning of asbestos hazard in the work area. An example is shown below.



4.0 **NOTICE OF ASBESTOS WORK**

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities involving friable asbestos. The following methods of communication apply:

- 4.1 The notification is to include a description of the planned Type 2 activity, its proposed duration, and in general terms the precautionary measures required to maintain a safe work environment. This information is to be provided to the following parties.

- 4.1.1 All appropriate Directors (St. George, UTM, UTSC, Capital Projects)
- 4.1.2 Manager, Environmental Hazards and Safety (St. George only)
- 4.1.3 Director, Environmental Health and Safety
- 4.1.4 Co-chairs of both the Trades and the Utilities Joint Health and Safety Committees
- 4.1.5 Co-chairs, Local Joint Health and Safety Committee
- 4.1.6 Local Area Occupants
- 4.2 Signage at Work Location
- 4.2.1 This sign informs building users of the asbestos-related work being conducted at that work location and that entry into the area is restricted to authorized personnel only. Signs are to be posted in the work area in sufficient numbers to warn of the hazard.

5.0 PERSONAL PROTECTION

- 5.1 *Respirators:* Workers are required to don respirators when performing Type 2 work. The following shall apply:
 - 5.1.1 All respiratory equipment shall be individually assigned and identified.
 - 5.1.2 Each worker must attend respiratory protection training and be fit tested prior to beginning work.
 - 5.1.3 Workers shall wear at least a half facepiece respirator fitted with purple HEPA (P100) filters.
 - 5.1.4 Disposable single-use type respirators are not permitted.
 - 5.1.5 All respirators shall be approved and labelled for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
 - 5.1.6 Replace filter cartridges as appropriate (36 hours of use or more frequently). Dispose of used cartridges as asbestos waste.
 - 5.1.7 No supervisor or worker shall have facial hair which affects respirator-to-face seal.
- 5.2 *Protective Clothing:* All workers must be provided with full body disposable coverall and shoe covers as described in Section 3.
- 5.3 *Facilities:* Provide facilities for washing hands and face which shall be used by every worker when leaving asbestos work areas.
- 5.4 *Practice:* Workers shall not eat, drink, smoke or chew while in work areas.
- 5.5 *Work Area Entry:* All persons shall wear respirators with HEPA (P100) filters and clean coveralls before entering work area.
- 5.6 *Work Area Exit:* Before leaving the Work Area and still wearing a respirator, a worker shall:
 - 5.6.1 Thoroughly HEPA vacuum protective clothing, respirator and footwear.
 - 5.6.2 Remove decontaminated coveralls and wash hands and face with water (in Work Area).
 - 5.6.3 Leave the Work Area in street clothes and proceed to the nearest washroom to wash hands and face.
 - 5.6.4 Coveralls may be reused throughout a day provided they are disposed of after each shift, and left inside the Work Area after each use.
 - 5.6.5 Thoroughly clean respirator.

6.0 PREPARATION – WORK AREAS

- 6.1 Clear immediate work areas of all moveable furnishings or equipment. Any furnishings or equipment not removed shall be adequately covered and sealed using polyethylene and duct tape.
- 6.2 Remove any friable material containing asbestos and any visible dust that is likely to be disturbed and that is lying on any surface in the vicinity of the work area by HEPA vacuuming or damp wiping.

- 6.3 Provide a temporary enclosure to prevent the spread of airborne dust from the work area. The enclosure shall be as airtight as conditions permit including the provision of a double overlapping flap at the entrance.
- 6.4 Post signs warning of asbestos hazard at the entrances to the work area.
- 6.5 Shut down all ventilation to and from the work area. Seal and tape all ventilation openings within the work area with polyethylene sheeting.
- 6.6 Locate HEPA vacuum body outside enclosure. Locate vacuum hose within enclosure to provide negative pressure effect in enclosure.
- 6.7 Don respiratory equipment, coveralls and shoe covers as describe in Section 5.

7.0 EXECUTION

- 7.1 Use only hand-held non-powered tools. Do not use compressed air.
- 7.2 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.3 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material.
- 7.4 Remove asbestos-containing thermal insulations in layers, maintaining all exposed surfaces of insulation in a wet condition.
 - 7.4.1 Seal exposed ends of asbestos-containing pipe insulation with 6 oz. canvas and lagging.
- 7.5 Remove asbestos-containing sprayed materials by scraping wetted ACM directly into waste containers. Do not allow ACM to fall to the floor of the enclosure.
- 7.6 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.
- 7.7 Carefully remove the asbestos material and place in an asbestos waste receptacle; double bag all waste as described in the Waste Transport and Disposal Section below and HEPA vacuum or damp-wipe the second container immediately prior to passing it out of the work area.
- 7.8 Seal the surfaces from which asbestos-containing material has been removed with a coat of encapsulant (sealer).
- 7.9 Frequently and at regular intervals during the work and immediately upon completion of the work, remove dust and waste from the workplace by HEPA vacuuming or damp-wiping, mopping or wet sweeping.
- 7.10 On completion of work, HEPA vacuum and wet clean all surfaces inside enclosure. Clean all reusable tools and pass out of enclosure. Clean framing for enclosure, plywood, etc. that will be reused and spray with encapsulant (sealer).
- 7.11 When removing enclosure, all polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste.

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 *For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-

container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.13

**DRILLING INTO A WALL THAT CONTAINS A NON-FRIABLE ASBESTOS-CONTAINING COATING USING
A HEPA VACUUM FOR DUST COLLECTION**

The exposure of workers and the corresponding measures and procedures for the minor disturbance of non-friable asbestos are classified as Type 2.

When authorized workers conduct Type 2 activities involving the minor disturbance of non-friable asbestos, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the requirements outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

- 1.1 This procedure applies to drilling holes in a wall that contains a non-friable asbestos-containing coating (e.g. sealant, paint) by means of power tools. For other disturbances (abrading, grinding, sanding or vibrating), refer to Procedure R2.14.
- 1.2 The procedure describes a modified method in Ontario Ministry of Labour, Regulations Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Reg. 278/05) as allowed by Section 23 of the Regulation and is for St. George Campus only. This procedure follows the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

2.0 DEFINITIONS

- 2.1 **Work Areas:** Where actual work activity involving non-friable asbestos takes place.
- 2.2 **Damp Wiping:** A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 MATERIALS AND EQUIPMENT

- 3.1 **HEPA Vacuum:** Vacuum cleaner equipped with a High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 **Dropsheet:** Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos.
- 3.3 **Amended Water:** A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.
- 3.4 **Sprayer:** Sprayer with mist nozzle for application of amended water or sealant.
- 3.5 **Asbestos Waste Receptacles:** Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.
- 3.6 **Small Tools:** Sponge(s), metal bristle brush(es), bucket(s), ladder(s), heavy duty scraper(s), etc.
- 3.7 **Tape:** Reinforced duct tape or double-sided tape suitable for sealing polyethylene to all surfaces to be covered.

- 3.8 *Respirator:* See section 5 Personal Protective Equipment.
- 3.9 *Coveralls:* Full body disposable clothing of an appropriate size with attached hood. It should be elasticized at the cuffs and hood, and be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.10 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.

4.0 NOTICE OF ASBESTOS WORK

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities. The following methods of communication apply:

- 4.1 Small scale activities where only a few holes are required, such as installing shelves, frames, wires, etc.: Notify local occupants of the work to be done per local site procedures.
- 4.2 Larger-scale activities, for example, as part of an overall abatement or construction project, should follow the same "Notice of Asbestos Work" procedures used for other Type 2 and 3 activities.

5.0 PERSONAL PROTECTION

- 5.1 Based on air sampling survey, respiratory protection is not required for coatings that contain 0.5-5% asbestos. However, workers performing the drilling are strongly advised to wear respirators. If the asbestos is >5%, respiratory protection is required.
- 5.2 When wearing a respirator, the following shall apply:
 - 5.2.1 All respiratory equipment shall be individually assigned and identified.
 - 5.2.2 Each worker must attend respiratory protection training and be fit tested prior to beginning work.
 - 5.2.3 Workers shall wear at least a half facepiece respirator fitted with purple HEPA (P100) filters.
 - 5.2.4 Disposable single-use type respirators are not permitted.
 - 5.2.5 All respirators shall be approved for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
 - 5.2.6 Replace filter cartridges as appropriate (36 hours of use or more frequently).
- 5.3 While not mandatory, workers are strongly advised to wear disposable coveralls.
- 5.4 A worker who is provided with protective clothing shall, before leaving the work area:
 - 5.4.1 Decontaminate his or her protective clothing and footwear by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing. Thoroughly clean respirator if applicable.
 - 5.4.2 If the protective clothing will not be reused, place it in an asbestos waste receptacle.
- 5.5 *Facilities:* Provide access to facilities for washing hands and face which shall be used by every worker when/after leaving asbestos work areas.
- 5.6 Smoking, eating, drinking or chewing in asbestos work areas is prohibited.

6.0 PREPARATION - WORK AREAS

- 6.1 Do not use compressed air.
- 6.2 Clear immediate work areas of all moveable furnishings or equipment.
- 6.3 In common areas, erect tape barriers to keep occupants at least 20 feet away. Other works not associated with the asbestos work shall stay away at least 20 feet from the work area. No signage is required.
- 6.4 An enclosure is not necessary for this activity. As appropriate, a drop-sheet below the work is required; extend the drop-sheet at least 3 feet beyond line of work. Use rip-proof polyethylene if work is above rough concrete or other surface that could tear polyethylene.
- 6.5 No ventilation shutdown is required. Seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting.
- 6.6 Don respiratory equipment and coveralls if applicable.

7.0 EXECUTION

- 7.1 Do not use compressed air.
- 7.2 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.3 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material.
- 7.4 Follow manufacturer's direction to operate the HEPA vacuum. Position the tool at the proposed location and the nozzle of the HEPA vacuum directly below the proposed location. Apply a gentle force and move the tool slowly as needed. Remove the drill about 5 seconds after the hole or cut is completed. HEPA vacuum the hole with nozzle to remove any loose dust from the hole.
- 7.5 Repeat steps above for each additional proposed location.
- 7.6 At completion of work, HEPA vacuum or wet wipe the drop-sheet, any other surfaces below the work area, tools and equipment.
- 7.7 Any polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste.

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually rip-proof polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 * For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

Standard Operating Procedures
for the Control of Asbestos Fibres
During Type 2 Operations

ID R2.14

**DISTURBANCE OF WALL THAT CONTAINS A NON-FRIABLE ASBESTOS-CONTAINING COATING USING
A HEPA FILTERED POWER TOOL**

The exposure of workers and the corresponding measures and procedures for the minor disturbance of non-friable asbestos are classified as Type 2.

When authorized workers conduct Type 2 activities involving the minor disturbance of non-friable asbestos, specific precautions are required in order to maintain a safe work environment for the workers and other building occupants.

The procedures follow the requirements outlined in the *Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations* (O.Reg. 278/05) under the Occupational Health and Safety Act of Ontario, and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

1.0 APPLICATION

- 1.1 This procedure applies to breaking, cutting, abrading, grinding, sanding or vibrating a wall that contains a non-friable asbestos-containing coating (e.g. sealant, paint) by means of power tools that are attached to dust-collecting devices equipped with HEPA filters. This work is classified as a Type 2 operation (Section 12(3)8 of 278/05). For drilling holes in the same type of wall, refer to Procedure R. 2.13.
- 1.2 The procedures follow the methods in Ontario Ministry of Labour, Regulations Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Reg. 278/05) and the transport and delivery of asbestos waste in accordance with Regulation 347 under the Environmental Protection Act.

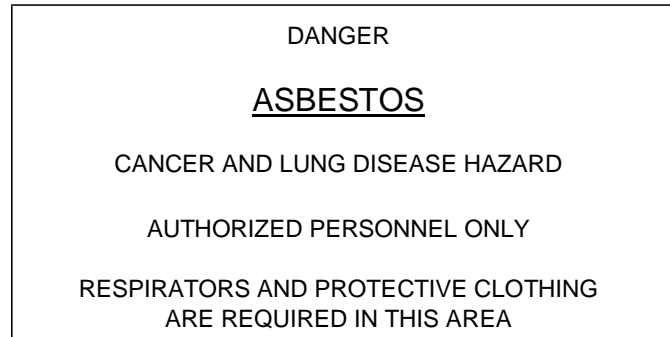
2.0 DEFINITIONS

- 2.1 **Work Areas:** Where actual work activity involving non-friable asbestos takes place.
- 2.2 **Damp Wiping:** A cleaning process for removing residual asbestos contamination using damp-cloths, sponges or mops.

3.0 MATERIALS AND EQUIPMENT

- 3.1 **HEPA Vacuum:** Vacuum cleaner equipped with High Efficiency Particulate Arresting (HEPA) Filter, fitted with appropriate tools. The vacuum equipment shall have a filtering system capable of collecting and retaining fibres greater than 0.3 microns in diameter at 99.97% efficiency.
- 3.2 **HEPA Filtered Tool:** A tool that has been manufactured specifically for the intended purpose and equipped with a filtering system that meets the same definition for filter efficiency as in Item 3.1.
- 3.3 **Dropsheet:** Rip-proof polyethylene plastic or other suitable material that is impervious to asbestos..
- 3.4 **Sprayer:** Sprayer with mist nozzle for application of amended water or sealant.
- 3.5 **Asbestos Waste Receptors:** Containers for waste must be dust tight, suitable for the type of waste, impervious to asbestos and identified as asbestos waste. All waste must have two layers of containment (e.g. double bagging) and be sealed and cleaned with a damp cloth or HEPA vacuum immediately before being removed from the work area. Also, it must be labelled as per the Ontario Ministry of Environmental regulation, and shall be acceptable to the disposal site selected and the Ministry of the Environment.

- 3.6 *Small Tools:* Sponge(s), metal bristle brush(es), bucket(s), ladder(s), heavy duty scraper(s), etc.
- 3.7 *Tape:* Reinforced duct tape or double-sided tape suitable for sealing polyethylene to all surfaces to be covered.
- 3.8 *Respirator:* See section 5 Personal Protective Equipment.
- 3.9 *Coveralls:* Full body disposable clothing of appropriate size with attached hood and elasticized at cuffs and hood, made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.10 *Shoe covers:* Elasticized disposable shoe covers with textured bottom for better grip. Shoe covers should be made of material which does not readily retain or permit penetration of asbestos fibres.
- 3.11 *Signage:* Warning of asbestos hazard in the work area:



4.0 NOTICE OF ASBESTOS WORK

Appropriate parties, including local-area occupants and when necessary other building users, must be notified of planned Type 2 activities. The following methods of communication apply:

- 4.1 The notification is to include a description of the planned Type 2 activity, its proposed duration, and in general terms the precautionary measures required to maintain a safe work environment. This information is to be provided to the following parties:
- 4.1.1 All appropriate Directors (St. George, UTM, UTSC, Capital Projects)
 - 4.1.2 Manager, Hazardous Construction Materials Group (St. George only)
 - 4.1.3 Director, Occupational Health and Safety
 - 4.1.4 Co-chairs of both the Trades and the Utilities Joint Health and Safety Committees
 - 4.1.5 Co-chairs, Local Joint Health and Safety Committee
 - 4.1.6 Local Area Occupants
- 4.2 Signage at the Work Location
- 4.2.1 This sign informs building users of the asbestos-related work being conducted at that work location and that entry into the area is restricted to authorized personnel only. Signs are to be posted in the work area in sufficient numbers to warn of the hazard.

5.0 PERSONAL PROTECTION

- 5.1 *Respirators:* Workers are required to don respirators when performing Type 2 work. The following shall apply:
- 5.1.1 All respiratory equipment shall be individually assigned and identified.
 - 5.1.2 Each worker must be instructed and fit tested with his/her respirator.
 - 5.1.3 Workers shall wear at least a half-face piece air-purifying respirator fitted with HEPA (P100) filters (material wetted). If the material cannot be wetted, a full face air-purifying respirator is required.

- 5.1.4 Disposable single-use type respirators are not permitted.
- 5.1.5 All respirators shall be approved for protection against asbestos fibres, and shall meet the design and usage requirements of the National Institute for Occupational Safety & Health (NIOSH).
- 5.1.6 Replace filter cartridges as appropriate (36 hours of use or more frequently). Dispose of used cartridges as asbestos waste.
- 5.1.7 No supervisor or worker shall have facial hair which affects respirator-to-face seal.
- 5.2 *Protective Clothing:* All workers must be provided with full body disposable coverall and shoe covers as described in Section 3.
- 5.3 *Facilities:* Provide access to facilities for washing hands and face which shall be used by every worker when/after immediately leaving asbestos work areas.
- 5.4 *Practice:* Workers shall not eat, drink, smoke or chew while in contaminated work areas.
- 5.5 *Work Area Entry:* All persons shall don respirators with HEPA (P100) filters and clean coveralls before entering work area.
- 5.6 *Work Area Exit:* Before leaving the Work Area and still wearing a respirator, a worker shall:-
 - 5.6.1 Thoroughly HEPA vacuum protective clothing and footwear.
 - 5.6.2 Remove decontaminated coveralls and respirator, and wash hands and face with water (in Work Area).
 - 5.6.3 Leave the Work Area in street clothes and proceed to the nearest washroom to wash hands and face.
 - 5.6.4 Coveralls may be reused throughout a day provided they are disposed of after each shift, or left inside the Asbestos Work Area after each use.

6.0 PREPARATION - WORK AREAS

- 6.1 Do not use compressed air.
- 6.2 Clear immediate work areas of all moveable furnishings or equipment.
- 6.3 Erect tape barriers to keep all non-protected personnel at least 20 feet away. Post signs warning of asbestos hazard at tape barrier (see Signage in Section 3).
- 6.4 An enclosure is not necessary for this asbestos work under the O. Regulation 278/05. However, an enclosure may be used to provide general dust control or provide a barrier in public areas. As appropriate, a drop-sheet below the work is required; extend the drop-sheet at least 3 feet beyond line of work. Use rip-proof polyethylene if work is above rough concrete or other surface that could tear polyethylene.
- 6.5 Seal and tape all ventilation openings close to the work area with polyethylene plastic sheeting. No ventilation shutdown is required.
- 6.6 Post signs warning of asbestos hazard at the entrances to the work area
- 6.7 Don respiratory equipment and coveralls as described above.

7.0 EXECUTION

- 7.1 Do not use compressed air.
- 7.2 Remove any visible dust from the work area or the surfaces of asbestos products by HEPA vacuuming or damp wiping.
- 7.3 Wet (with amended water) any asbestos-containing material that may be disturbed during this work. Maintain wet conditions throughout work. Do not use excess water which will drip off the material.
- 7.4 Follow manufacturer's direction to operate the HEPA vacuum. Apply a gentle force and move the tool Follow manufacturer's direction to operate the HEPA filtered tool slowly as needed. Remove the tool about 5 seconds after the hole or cut is completed.

- 7.5 Repeat steps above for each additional proposed location.
- 7.6 At completion of work, HEPA vacuum or wet wipe the drop-sheet, any other surfaces below the work area, tools and equipment.
- 7.7 Any polyethylene, tape and cleaning cloths are to be wetted and shall be carefully rolled together and bagged as asbestos waste. Coveralls shall be disposed of as contaminated waste.

8.0 WASTE TRANSPORT AND DISPOSAL

- 8.1 Place asbestos waste into asbestos waste receptacles. Asbestos waste must be double-bagged, or double-contained, in receptacles that are clearly marked as containing asbestos. The bags or containers shall be selected to prevent any perforations or tears during filling, transport and disposal. The bags are usually rip-proof polyethylene bags sealed with duct tape. The outer bags must be HEPA vacuumed or damp wiped to remove any surface contamination immediately before being removed from the work area.
- 8.2 * For the St. George campus, transport the sealed containers to the locked, labelled dump-container that is maintained by Facilities and Services. The key for the locked dump-container can be obtained from the Materials Expeditor (Trade Services Tool Crib). Place the asbestos waste bags in the dump container and relock the dump-container. For the appropriate disposal procedures at the Mississauga and Scarborough campuses, consult with the Director of the University department that initiated the work.
- 8.3 Cinderblock waste with asbestos-containing coating must be disposed of as asbestos waste.