



**Scope of Work – Designated Substances Abatement/Procedures
5th Floor MDL Renovation Project – Project# P006-22-176
Robarts Library Building: 130 St. George Street Toronto**

The intent of this scope is to remove asbestos-containing materials and other designated substances present within the above-mentioned project locations. This document also includes procedures to be followed while 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 [DSSR]* issued for this project.

The project scope includes all locations as detailed on the project architectural, mechanical, electrical and structural drawings.

All ventilation shutdowns for the purpose of isolating and capping the ventilation system will be schedule after regular hours 6:00pm to 7:00am weekdays and weekends [NO CHANGE EXPECTED].

All asbestos abatement work and associated demolition is scheduled to be carried out after regular hours 6:00pm to 7:00am weekdays and weekends [NO CHANGE EXPECTED].

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.

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

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

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

All items of scope of work listed below are part of the Base Bid Price unless otherwise specified.

The University of Toronto asbestos waste bin located on the south of central steam plant (7 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

Negative air machines, able to maintain a negative pressure of 0.02 inches of water relative to the areas outside the enclosure will be required for ALL Type 2 and Type 3 enclosures. Prior to the start of work the contractor will arrange DOP tests of all negative air machines on site. Reinstating of any components disturbed or removed for the reason of exhaust (indoors or outdoors) is included in this scope.

The negative air machines shall be installed appropriately in order to obtain uniform negative air pressure throughout the Type 2 and Type 3 enclosures. A 3rd party consultant will perform smoke tests to confirm uniform distribution of negative air pressure throughout the enclosures.

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

1. SECTION 1 – Type 3 Ductwork Removal and Associated Type 2 Asbestos Abatement

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

- 1.1 Set-up Type 2 asbestos enclosure (this might be in outside the type 3 work area).
- 1.2 Prior to removing ceiling or beginning any asbestos contamination, provide openings in ceilings in order to allow the mechanical subcontractor to cut and cap the ventilation system, under Type 2 conditions.
- 1.3 Set-up full Type 3 enclosure/s. Rip-proof (orange) polyethylene sheet (6 mills thickness) shall be used for all enclosures.
- 1.4 Remove and dispose as non-asbestos waste enough ceiling tiles required to access and remove the ductwork, diffusers, grilles and flex duct as shown on the mechanical drawings.
- 1.5 Construct upper seals around all mechanical equipment scheduled for removal for air clearance testing at project completion.
- 1.6 Only remove any ceiling mounted lights and equipment if required for access to remove the ductwork, diffusers, and grilles.



- 1.7 All ductwork, ceiling mounted diffusers, return air grilles and flex duct as shown on the mechanical drawings shall be removed and disposed of as asbestos waste.
- 1.8 Clean and decontaminate enclosure/s for air clearance sampling to be performed by others.
- 1.9 Remove and dispose enclosure upon completion of work.

2. SECTION 2: Type 2 Flooring Removal and Mastic Grinding

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 a qualified abatement contractor.

- 2.1 Remove existing carpet finishes.
- 2.2 Set-up type 2 asbestos enclosure/s (with full enclosure and negative air pressure) at locations where asbestos containing flooring and mastic is scheduled for removal.
- 2.3 Historic asbestos-containing mastic is present under carpet finishes. Type 2 enclosure set-up is also required for the purpose of floor grinding in areas where carpets are scheduled to be removed.
- 2.4 Remove and dispose asbestos-containing vinyl flooring and adhesive mastic.
- 2.5 Grind adhesive mastic/glue present under existing flooring including areas under the carpet 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.
- 2.6 Clean, decontaminate enclosure/s and dispose the enclosure waste upon approval of visual inspection performed by others.

3. SECTION 3: Other Asbestos Abatement Items/Procedures – Included in Base Bid Price

- 3.1 For entry and any other work inside the mechanical shafts and risers the University of Toronto Standard Operating Procedures ID 0.10 and ID R2.10 shall be followed (copies attached).
- 3.2 The General Contractor and their sub-contractors shall follow the University of Toronto Standard Operating Procedure ID R2.05 (attached) for drilling holes and removing screws in drywall finishes applied with asbestos-containing drywall joint compounds.
- 3.3 In the event the current project scope of work requires making minor openings in gypsum board or drywall finishes applied with drywall joint compounds. The General Contractor and their subcontractors shall follow Type 1 asbestos abatement procedures [if one square meter or less area of gypsum board or drywall applied with drywall joint compound is to be removed]. The University of Toronto Standard Operating Procedure R1.00 (attached), shall be followed including training and respirator fit test requirements. Removed drywall shall be disposed of as asbestos waste.

4. SECTION 4: Lead Abatement/Procedures Scope of Work Details

No Lead paint is suspected to be present on the drywall walls scheduled for removal under this project. The walls were installed at the time of a 2008 renovation project and lead based paint would not have been used.



All remaining paint finishes on walls, windows, structural members, doors, baseboards, floors, ceilings, piping systems, ductwork and other mechanical equipment within the current project locations and throughout other areas of the building should be assumed to contain lead ($\geq 0.1\%$ or $1000 \mu\text{g/g}$ or 1000PPM Lead Content) 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 (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.

5. SECTION 5: 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.

6. SECTION 6: General

- 6.1 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.
- 6.1.1 Ontario Regulation 278/05, Occupational Health and Safety Act.
- 6.1.2 University of Toronto Asbestos Management Program, available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>
- 6.1.3 Ontario Ministry of Labour Guidelines for Lead on Construction Projects, available at <https://www.labour.gov.on.ca/english/hs/pubs/lead/>
- 6.1.4 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/>
- 6.1.5 Ontario Ministry of Labour Guideline “Silica on Construction Projects” available at <https://www.labour.gov.on.ca/english/hs/pubs/silica/>
- 6.1.6 University of Toronto “Crystalline Silica Procedures” available at <https://ehs.utoronto.ca/resources/policies-and-procedures/>
- 6.2 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.
- 6.3 Rip-proof (orange) polyethylene sheet (6 mills thickness) shall be used for all enclosures and drop sheets.
- 6.4 All asbestos waste shall be placed into appropriate 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.
- 6.5 Ventilation to and from the work area will remain shutdown during the work. However, the contractor will be required to temporarily seal all ventilation inlets and outlets.



- 6.6 Quality Control inspections and air monitoring will be performed by a consultant throughout the project. Any contamination of surround areas indicated by visual inspection or air monitoring will require the complete enclosure and clean-up of the affected areas without any extra cost to the University of Toronto.
- 6.7 The contractor to protect against any damages to all electrical/mechanical systems, sprinklers, cables, conduits etc. during the execution of work.
- 6.8 Isolation/Installation Responsibilities:

<u>Item</u>	<u>Responsibility</u>
6.8.1 Electrical shutdowns	Arranged by Project Manager
6.8.2 Electrical panel/cable supply	Contractor
6.8.3 Electrical isolation & temporary panel installation	Contractor
6.8.4 Provide plumbing connections mains for hot and cold water	Arranged by Project Manager
6.8.5 Hoses for water supply	Contractor
6.8.6 Plumbing isolations	Arranged by Project Manager
6.8.7 Ventilation shutdowns	Arranged by Project Manager
6.8.8 Ductwork capping	Contractor
6.8.9 Isolation of sprinklers, heat detectors	Arranged by Project Manager
6.8.10 Type 3 enclosure air clearance tests	Arranged by Project Manager

7. SECTION 7: Attachments

The following documents referred above are attached with this scope and should be considered part of the bid documents:

- 7.1 Temporary electrical panel specifications.
- 7.2 University of Toronto Standard Operating Procedures.

END OF DOCUMENT



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 etc. if not contaminated with asbestos.
- Inspection, checking metres, reading instruments etc.

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 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.

1.3 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.

1.4 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.



Office of Environmental Health and Safety
UNIVERSITY OF TORONTO

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

ID R1.00

NON-FRIABLE ASBESTOS DISTURBANCE

The exposure of workers and the corresponding measures and procedures for the minor disturbance of asbestos in non-friable products are classified as Type 1.

When authorized workers conduct Type 1 activities involving the disturbance of asbestos in non-friable products, 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 activities which do not generate appreciable amounts of airborne asbestos, and generally present minimal hazard to workers or bystanders.
- 1.2 These operations include but are not limited to:
 - 1.2.1 Installation or removal of intact non-friable asbestos containing products.
 - 1.2.2 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos materials if the material is wetted to control dust, and the work is done using non-powered hand-held tools.
 - 1.2.3 Removing less than one square metre of drywall in which asbestos joint filling compounds were used.
 - 1.2.4 Removal of asbestos cement products that can be removed intact or in sections (e.g. transite ceiling tiles and wall boards). This was formally SOP R1.40 and has been merged into this procedure since the same procedures apply.
- 1.3 This procedure does NOT apply to the installation or removal of asbestos-containing ceiling or floor tiles.
- 1.4 This procedure does NOT apply to the sanding of non-asbestos materials used for repair of drywall or other non-asbestos materials where there is no disturbance of underlying non-friable asbestos materials. As there is no asbestos disturbance, this is considered a non-asbestos activity.

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 While not mandatory, workers are strongly advised to 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 Facilities for washing hands and face must be provided and shall be used by every worker when leaving asbestos work areas.
- 4.6 Smoking, eating, drinking or chewing in asbestos work areas is prohibited.

5.0 PREPARATION - WORK AREAS

- 5.1 While posting signs for a Type 1 operation is not a legislative requirement, signage is useful for preventing others from approaching 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 or the surfaces of bound asbestos products by HEPA vacuuming or damp wiping.
- 5.4 Before beginning work, wherever practicable, cover floor and anything below the work with polyethylene drop-sheets to catch debris.

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 Start disturbing/removing/cut/drill, etc. with non-powered hand tools.
- 6.4 If using a hand drill and you encounter other, harder materials beneath the drywall and you are required to use a power drill, use the hand drill to drill the hole larger than the drill bit of the power drill so that the drill bit does not make contact with the drywall when drilling the material underneath. Before using power tool, damp wipe the surface to remove any drywall debris and per above, wet with area with amended water. Where possible, use non-powered hand tools for the entire task.
- 6.5 Immediately place non-friable asbestos waste into an asbestos waste receptacle. Double bag all waste as described in Section 7.0. HEPA vacuum and damp-wipe the second container/bag before removing waste receptacles from the work area.
- 6.6 Remove dust and waste from the workplace frequently during the work. Dust removal must be by HEPA vacuuming, damp mopping or wet sweeping. Waste removal should follow the procedures found in section 7.
- 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.

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 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.
- 7.2 *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 Drywall containing asbestos drywall joint compound 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 R2.05

**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.

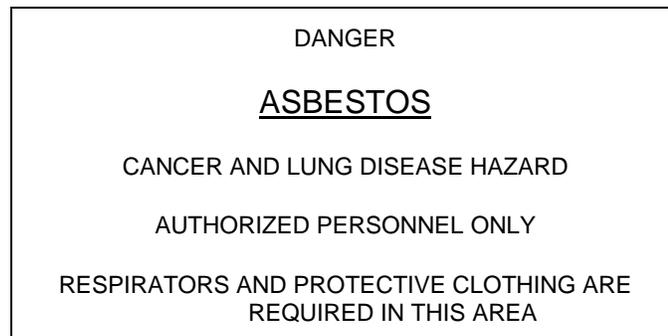
2.0 DEFINITIONS

- 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

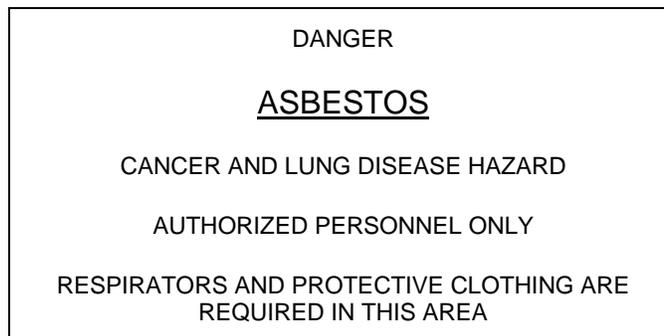
- 1.1 These procedures apply to all work involving the minor removal of friable asbestos-containing material; this activity may generate enough airborne asbestos to require protective equipment, but is of short duration..
- 1.2 Minor removal of material containing asbestos means the removal of **one 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 $R = \text{Radius of pipe and insulation}$).
- 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.



Asbestos Abatement Temporary Power Requirements:

Wet Locations:

1. To supply power to temporary electrical panel the capacity of the power source shall be verified prior to the connection of the temporary panel.
2. Any live buses/ parts of the panelboards shall not be exposed and accessible.
3. All temporary panels shall be fed with mechanically protected weatherproof cables such as tek cable or wiring in seal tight conduit complete with weatherproof connectors.
4. Temporary Electrical Panels shall be weatherproof, complete with drip shields.
5. Seal Temporary Electrical panels to avoid any possibility of water migration, this shall include any unused knockouts or mounting openings.
6. All receptacles shall be ground fault interrupter receptacles or protected by ground fault circuit interrupter breakers.
7. All receptacles shall be installed in weatherproof boxes.
8. All connections from receptacles to panel shall be in conduit complete with weatherproof connectors or liquid tight flexible conduit complete with weatherproof connectors.
9. All installations shall have a means of disconnection of power in case of emergency.
10. All Electrical work must be performed by members of the International Brotherhood of Electrical Workers, Local 353.
11. All Electrical work shall comply with the latest edition of the Ontario Electrical Safety Code, Ontario Building Code and applicable C.S.A. and U.L.C. Standards. Ontario Electrical Safety Authority inspection shall be applied and paid for by this Contractor. Provide certificate prior to final acceptance of the work.
12. All Electrical power supply interruptions shall be arranged with the U of T construction Supervisor at least 10 working days in advance and shall be carried out only outside normal working hours.

Dry Locations:

1. To supply power to temporary electrical panel the capacity of the power source shall be verified prior to the connection of the temporary panel.
2. Any live buses/ parts of the panelboards shall not be exposed and accessible.
3. All temporary panels shall be fed with mechanically protected weatherproof cables such as tek cable or wiring in seal tight conduit.
4. All receptacles shall be ground fault interrupter receptacles or protected by ground fault circuit interrupter breakers.
5. All installations shall have a means of disconnection of power in case of emergency.
6. All Electrical work must be performed by members of the International Brotherhood of Electrical Workers, Local 353.
7. All Electrical work shall comply with the latest edition of the Ontario Electrical Safety Code, Ontario Building Code and applicable C.S.A. and U.L.C. Standards. Ontario Electrical Safety Authority inspection shall be applied and paid for by this Contractor. Provide certificate prior to final acceptance of the work.
8. All Electrical power supply interruptions shall be arranged with the U of T construction Supervisor at least 10 working days in advance and shall be carried out only outside normal working hours.

July 18, 2024

Attention: Mr. Mohammad Ashjaei

**Re: Designated Substances in Building Materials Survey Report [DSSR]
Robarts 5th Floor MDL Renovations P006-22-176
Robarts Library Building (Building #006)**

Dear Mr. Ashjaei:

Further to your request, F&S Hazardous Construction Materials Group (HCMG) is pleased to provide the University Planning, Design & Construction (UPDC) with this final report summarizing observations made during the review of available reports, bulk sampling records and current investigations for designated substances in building materials for the purpose of the above-mentioned project at the University of Toronto facility John P. Robarts Library (Building# 006) located at 130 St. George Street Toronto.

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 status of accessible designated substances for the current project locations in specific as detailed on project architectural, mechanical, electrical and structural drawings and for the remaining areas of the building in general.

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
Robarts 5th Floor MDL Renovations P006-22-176
John P. Robarts Library (Building# 006) located at 130 St. George Street Toronto

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

Quality control inspections for designated substances disturbance/removal will be performed by designated external consultant 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 for accessible designated substances in building materials the following are our observations and recommendations.

ASBESTOS

For removal or disturbances of asbestos-containing materials, 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 asbestos abatement contractor and all appropriate procedures as detailed in this report and applicable regulations shall be followed.

Sprayed Fireproofing

No asbestos containing sprayed fireproofing is present in the current project locations.

Friable asbestos-containing (Chrysotile) sprayed fireproofing is present on deck and beams in rooms adjacent to the mechanical room located on the 14th floor. Partial areas with asbestos-containing sprayed fireproofing are currently encapsulated.

Friable asbestos-containing (Chrysotile) sprayed fireproofing is present on structural members that run across and within the ducts located in penthouse mechanical room.

Friable asbestos-containing (Chrysotile) sprayed fireproofing is present inside mechanical shafts, back surface of fire-hose cabinets and other utility cabinets located within the building. Fireproofing overspray is suspected to be present on the surfaces of walls accessible above ceiling from areas adjacent to the mechanical shafts.

Fireproofing present in mechanical spaces 15002 and 15005 is tinted blue and is confirmed not to contain asbestos.

Please refer to fireproofing spray layout floor plans for this building, attached at Appendix A. Areas with asbestos containing fireproofing are shown in yellow, whereas blue hatch identifies areas with non-asbestos 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).
- Care should be exercised while removing ceilings in areas adjacent to the mechanical shafts. The work shall be stopped immediately if any fireproofing overspray is observed on walls adjacent to the pipe shafts.
- As a requirement of Ontario Regulation 278/05, "removal of 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 work in 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 B).

Thermal Mechanical Insulation

No thermal mechanical insulation suspected to contain asbestos was observed at accessible areas of the current project locations. Friable asbestos-containing thermal insulation may exist in presently inaccessible and hidden wall/ceiling penetrations and cavities. Any insulating material identified or discovered in such locations shall be assumed to contain asbestos unless proven otherwise through confirmatory sampling.

Friable asbestos-containing 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 fittings at various other locations throughout the building, which are not part of the current project. 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 also exist in presently inaccessible and hidden wall/ceiling 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 mechanical system insulation shall proceed without following appropriate asbestos procedures as listed below.

- Removal of asbestos-containing piping system 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)].

Drywall Joint Compound

The drywall finishes, scheduled for removal for the current project in Room 5025 to 5030 and 5038A, B, C, D were installed in 2008 under a previous renovation project and are not suspected to contain asbestos in the drywall joint compound.

Gypsum board and drywall finishes within the remainder of the project locations and various other areas throughout the building consist of both asbestos-containing (Chrysotile) and non-asbestos drywall joint compound applications. All gypsum board and drywall finishes shall be considered to have non-friable asbestos-containing drywall joint compound applications unless proven otherwise through confirmatory sampling or a review of available abatement/sampling records.

No removal or disturbance of gypsum board and drywall finishes applied with asbestos-containing drywall joint compound within the building 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 gypsum board and drywall finishes applied with asbestos-containing drywall joint compound is to be removed. Type 2 procedures if greater than one square meter area of gypsum board and drywall finishes applied



with asbestos-containing 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 B, shall be followed for drilling holes in drywall finishes applied with asbestos-containing drywall joint compounds.

Vinyl Flooring

Non-friable asbestos-containing (Chrysotile) vinyl floor tiles and adhesive mastic are present in the current project locations.

Multiple locations under the carpets were inspected and the asbestos-containing vinyl flooring extends only a few feet under the carpets beside where the floor tiles are visible.

Please Note: Historic asbestos-containing mastic exists under all carpet finishes within the current project locations and at various other areas of the building.

Floor finishes in other areas of the building that are not part of the current project consist of both asbestos-containing and non-asbestos vinyl floor tiles. All vinyl floor finishes and adhesive compounds in such areas shall be considered to contain asbestos unless proven otherwise through confirmatory sampling or a review of available records.

No removal or disturbance of asbestos-containing vinyl floor tiles and adhesive mastic shall proceed without following appropriate asbestos procedures as listed below.

- No asbestos-containing floor tiles and mastic are to be cut, drilled, ground or removed without following appropriate asbestos procedures.
- Type 2 (full enclosure) asbestos 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.
- 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.

Ceiling Tiles

No asbestos-containing ceiling tiles were observed within the current project locations.

The 12x12 ceiling tiles present in the current project locations are fastened in a metal grid and no suspect asbestos adhesive is present.

Lay-in and stick-on ceiling tiles are present within the current project locations and at various other areas of this building. Based on laboratory analytical results of bulk samples of this homogeneous material obtained from the building in the past, no asbestos-containing lay-in or stick-on ceiling tiles are present within this building; however, no sampling records are available for the glue that holds stick-on ceiling tiles in place. Any adhesive glue if discovered above the stick-on tiles shall be considered to contain asbestos unless proven otherwise through confirmatory sampling.

No removal or disturbance of asbestos-containing glue shall proceed without following appropriate asbestos procedures as listed below:

- Caution should be exercised, and work shall immediately be stopped, and appropriate asbestos procedures be followed, in the event of discovery of adhesive glue under the ceiling tiles. Removal of



asbestos-containing adhesive glue shall follow Type 1 or Type 2 asbestos procedures based on quantity of materials to be removed.

- The University of Toronto Standard Operating Procedure ID R2.04, attached at Appendix B, shall be followed for drilling holes (each less than ½ inch in diameter) into asbestos-containing adhesive glue.

Plaster

Based on laboratory analytical results of bulk samples of this homogeneous material obtained from the building in the past and available abatement records, all plaster finishes in the current project locations and the remainder of the building can be considered not to contain asbestos.

Texture Coat Finishes

No texture coat finishes were observed within the current project locations.

Texture coat/stucco finishes are present on walls and ceilings in select locations of this building, including on wall insulation within the basement mechanical room. Based on laboratory analytical results of bulk samples of this homogeneous material obtained from the building in past, all texture coat/stucco finishes within the building are identified to contain Chrysotile 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 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 surface area of texture coat/stucco finish is to be removed. Type 3 procedures if greater than one square meter surface area of texture coat/stucco finish is to be removed].
- The University of Toronto Standard Operating Procedure ID R2.04, attached at Appendix B, shall be followed for drilling holes (each less than ½ inch in diameter) in asbestos-containing texture coat/stucco finishes.

Block Masonry Sealant

Based on laboratory analytical results of representative bulk samples of block masonry sealant present underneath the paint on the walls collected from available masonry locations within this building, all block masonry sealant present underneath the paint on visible masonry walls of this building can be considered not to contain asbestos.

Manufactured Asbestos Cement Products (Transite)

No manufactured asbestos cement products were observed within the current project locations.

Non-friable asbestos-containing (Chrysotile) cement product (Transite) is present as acoustic wall panels in select locations of this building.

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

- Type 1 procedures are required for the intact removal and re-installation of manufactured asbestos cement products. If the transite material is broken, cut, drilled, ground, sanded, etc. the more stringent Type 2 or Type 3 asbestos procedures must be followed.
- No disturbance, cutting, drilling, grinding, sanding, etc. of asbestos cement products is allowed without following appropriate asbestos procedures.

Fire Stop Material

Asbestos-containing (Chrysotile) fire stop material is present in the current project locations and throughout the remainder of the building at locations where pipes penetrate walls, floors and ceilings. Asbestos-containing fire stop material may be present at wall and ceiling penetration in locations that are currently inaccessible. These locations include hidden pipe chases in wall and ceiling cavities.

No work involving disturbance of this material is to take place without following appropriate asbestos procedures.

- Asbestos Type 1 or Type 2 (enclosure on each side) procedures shall be followed for removal of asbestos-containing fire-stop material at wall, floor or ceiling penetrations of piping system.

Others

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

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

- Paper inside elevator doors.
- Rope gaskets in pipe riser access panels.

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	• Window/door caulking	• Gaskets/internal liners in mechanical and electrical equipment	• Transite drainpipes
• Fire rated door liners	• Electrical wiring jacket	• Electrical panel backing	Transite in HV cable trench and equipment
• Gaskets in piping systems	• Firestop materials	• Roofing materials in sections not replaced	

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 as listed below.

LEAD

No Lead paint is suspected to be present on the drywall walls scheduled for removal under this project. The walls were installed at the time of a 2008 renovation project and lead based paint would not have been used.

All remaining paint finishes on walls, windows, structural members, doors, baseboards, floors, ceilings, piping systems, ductwork and other mechanical equipment within the current project locations and throughout other areas of the building should be assumed to contain lead ($\geq 0.1\%$ or 1000 $\mu\text{g/g}$ or 1000PPM Lead Content) unless proven otherwise through confirmatory sampling or a review of previous sampling/abatement records.

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. 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

Fuel storage tanks are present in the emergency generator location in this building.

Benzene is a natural part of crude oil, and gasoline. Benzene, or Benzol, is a colorless liquid with a sweet or aromatic hydrocarbon odour. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities. Exposure to pure benzene within buildings other than where it is produced or used as part of a manufacturing process is unlikely. Breathing benzene can cause drowsiness, dizziness, and unconsciousness; long-term benzene exposure causes effects on the bone marrow and can cause anemia and leukemia.

- 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 the current investigations, designated substances (Asbestos, Lead, Mercury and Silica) are present in different building materials within the current project locations and other areas of Robarts Library Building (Building #006).

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 an investigation (i.e., sampling and analysis) undertaken 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
Coordinator
Hazardous Construction Materials Group
University of Toronto
F&S Property Management
Phone: 416-791-9998
doug.coby@utoronto.ca

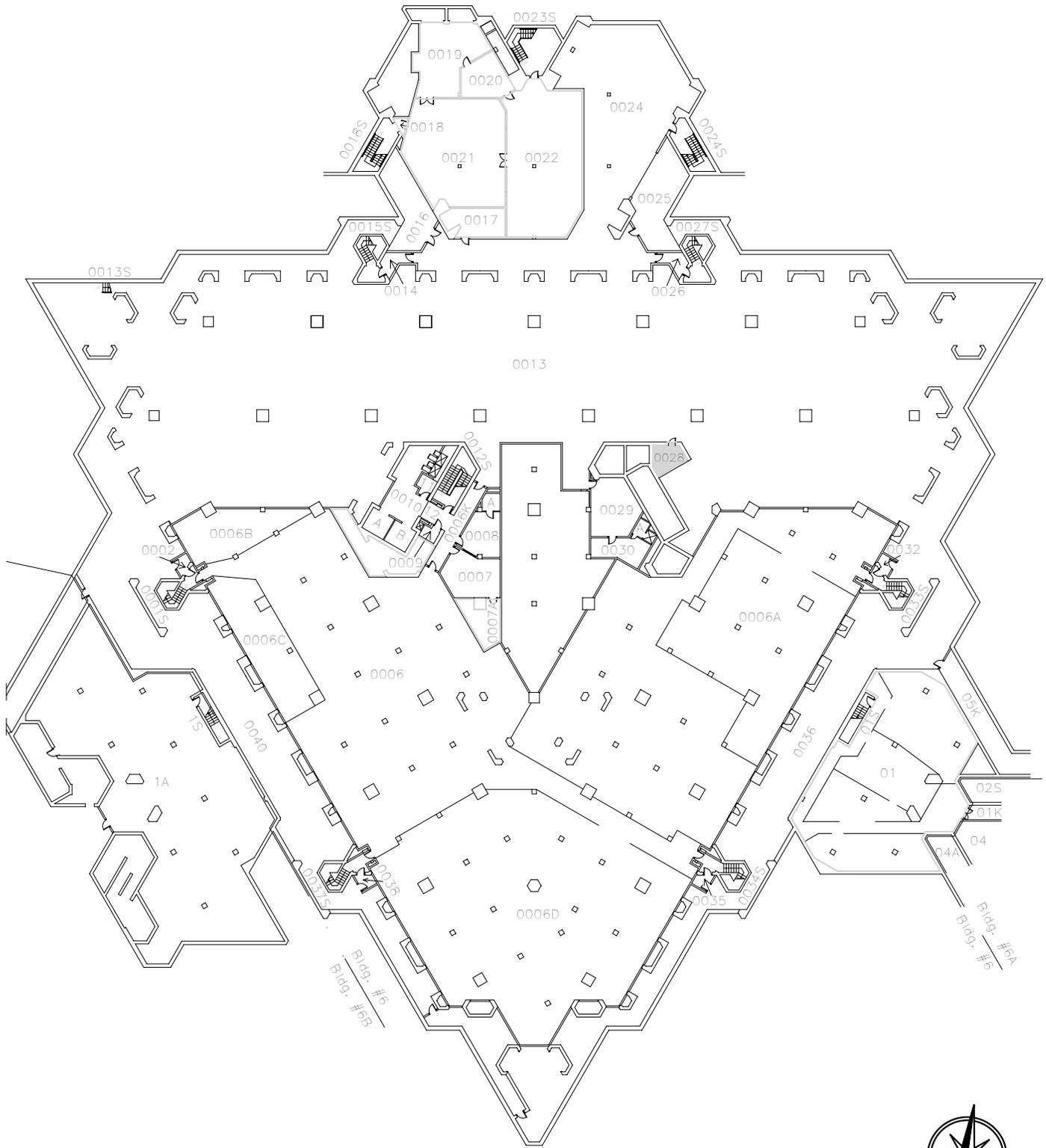
Reviewed By:

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University of Toronto
F&S Property Management
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irfan.miraj@utoronto.ca



APPENDIX A

Fireproofing Locations Floor Plans



SECOND BASEMENT FLOOR PLAN REV FEB 2014

LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

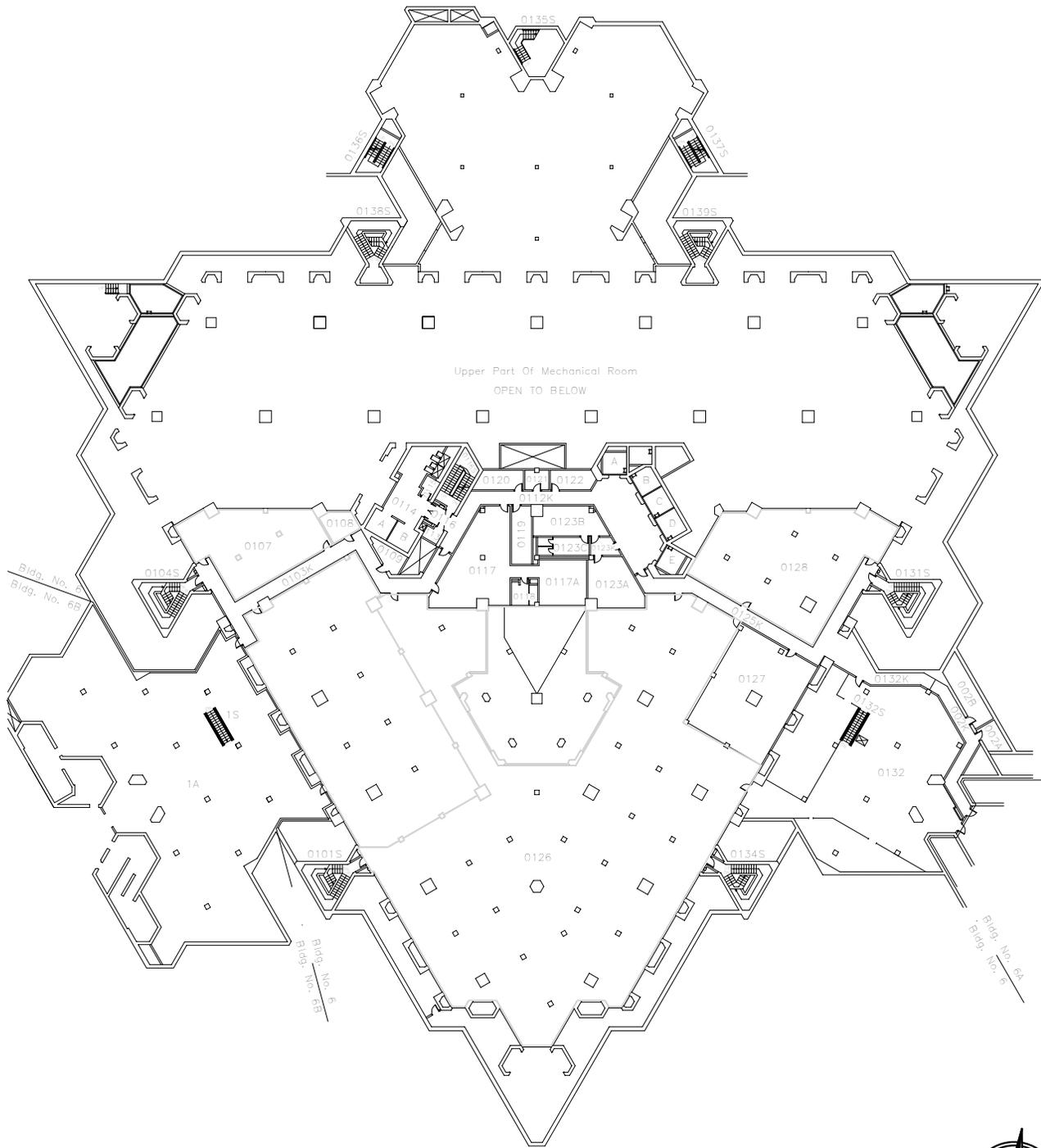
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Drawing No:

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FIRST BASEMENT FLOOR PLAN REV Feb 2014



LEGEND:



Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

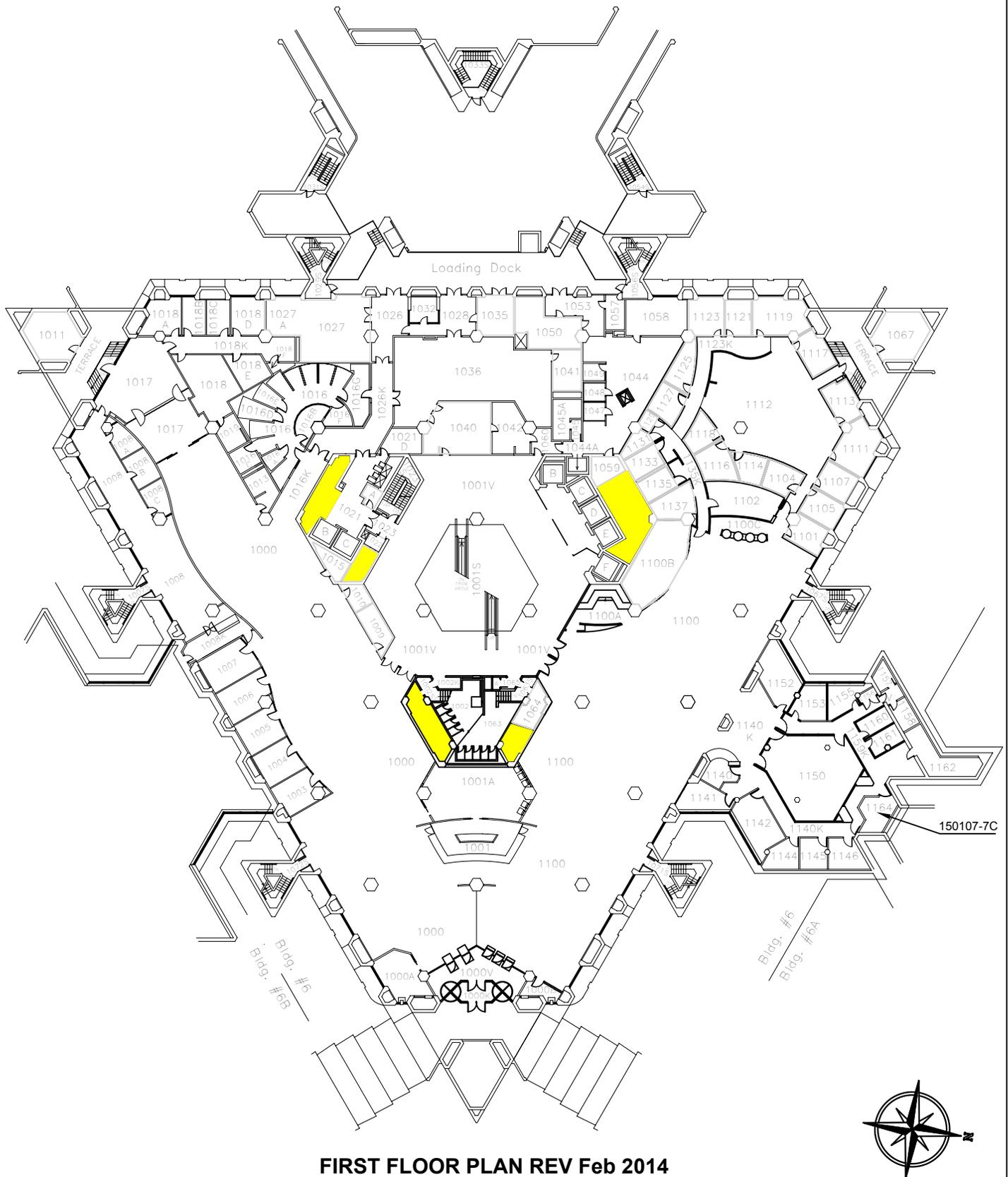
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FIRST FLOOR PLAN REV Feb 2014

LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Robarts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

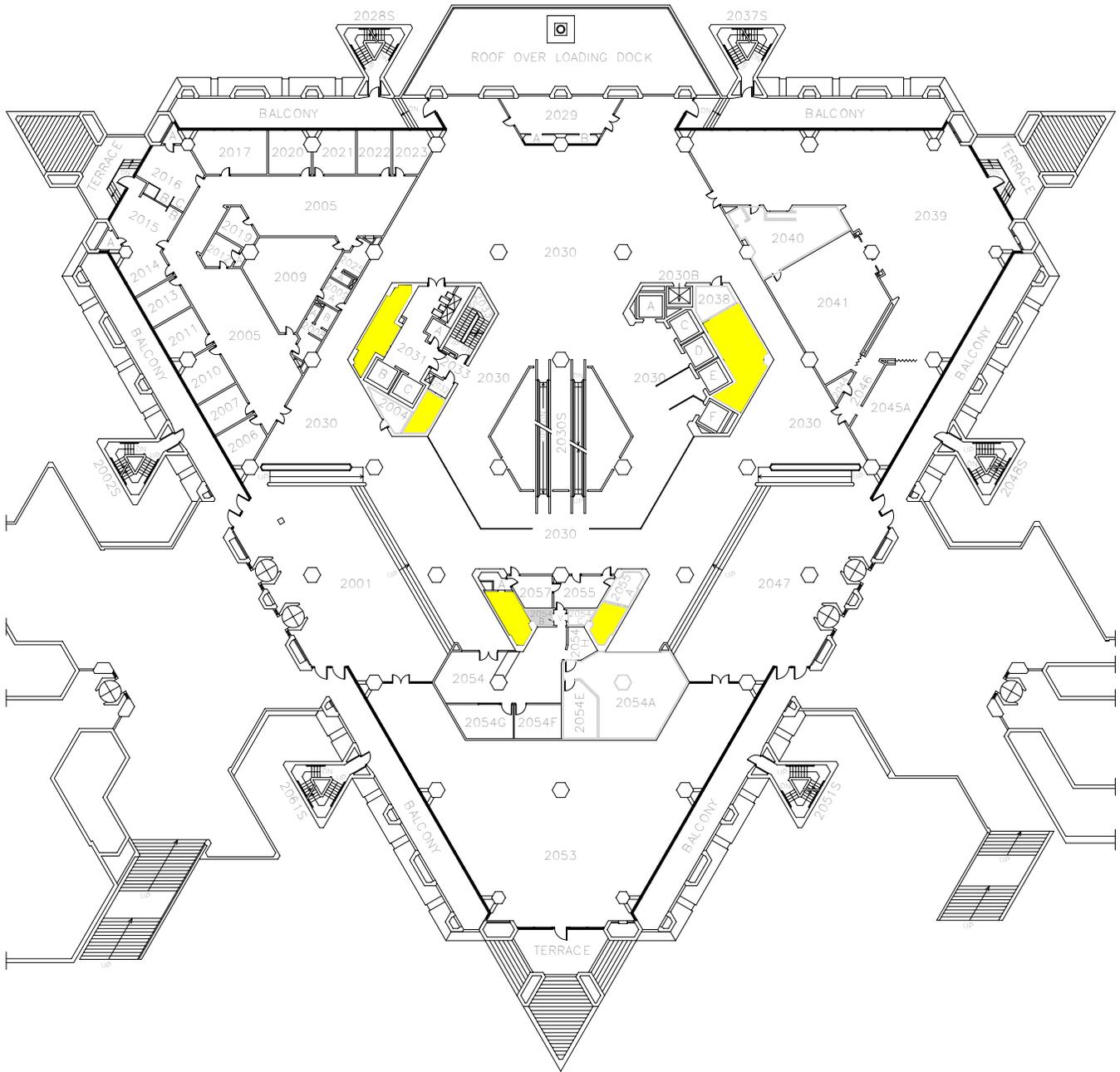
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Drawing No:

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SECOND FLOOR PLAN REV Feb 2014



LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

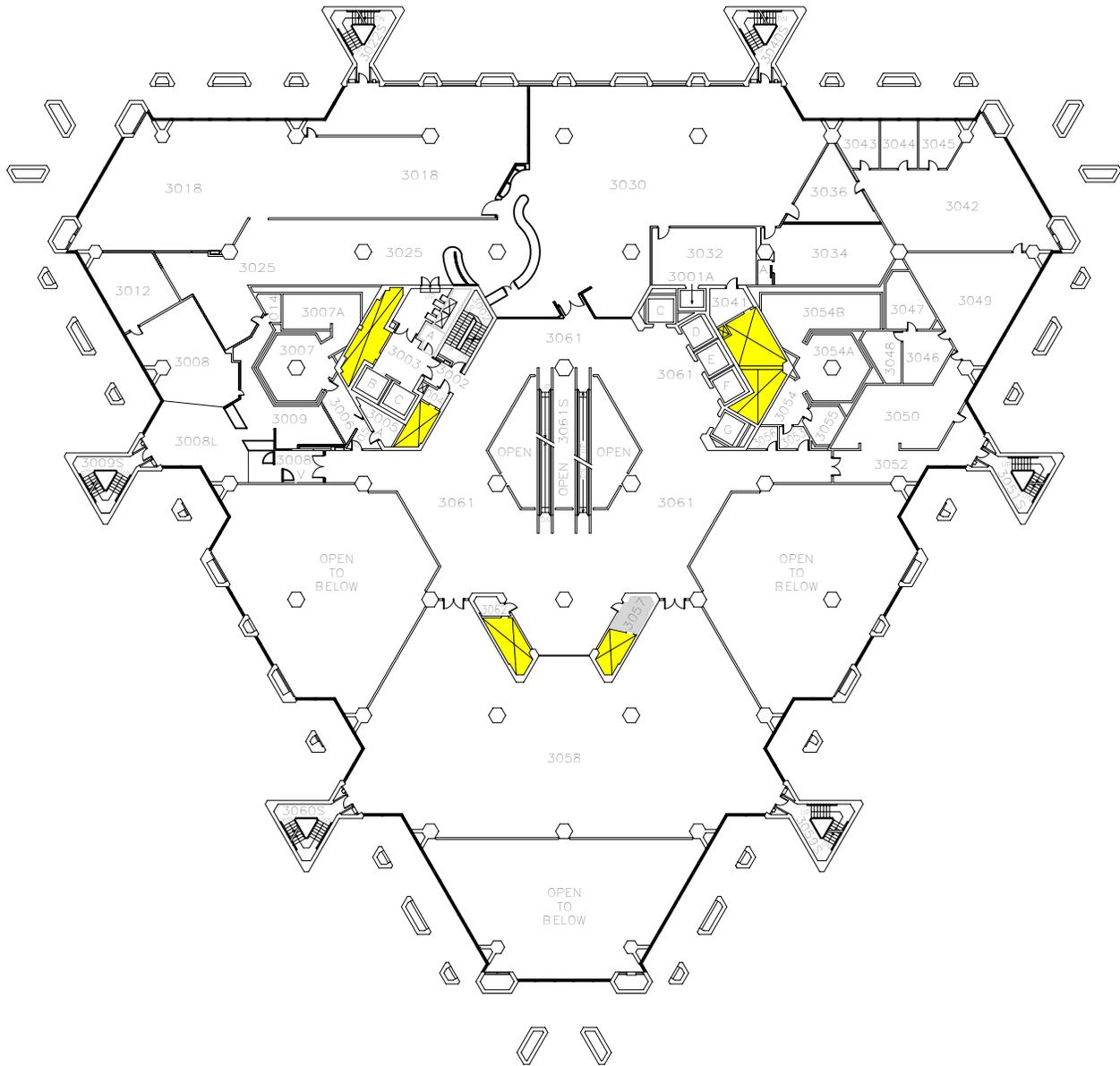
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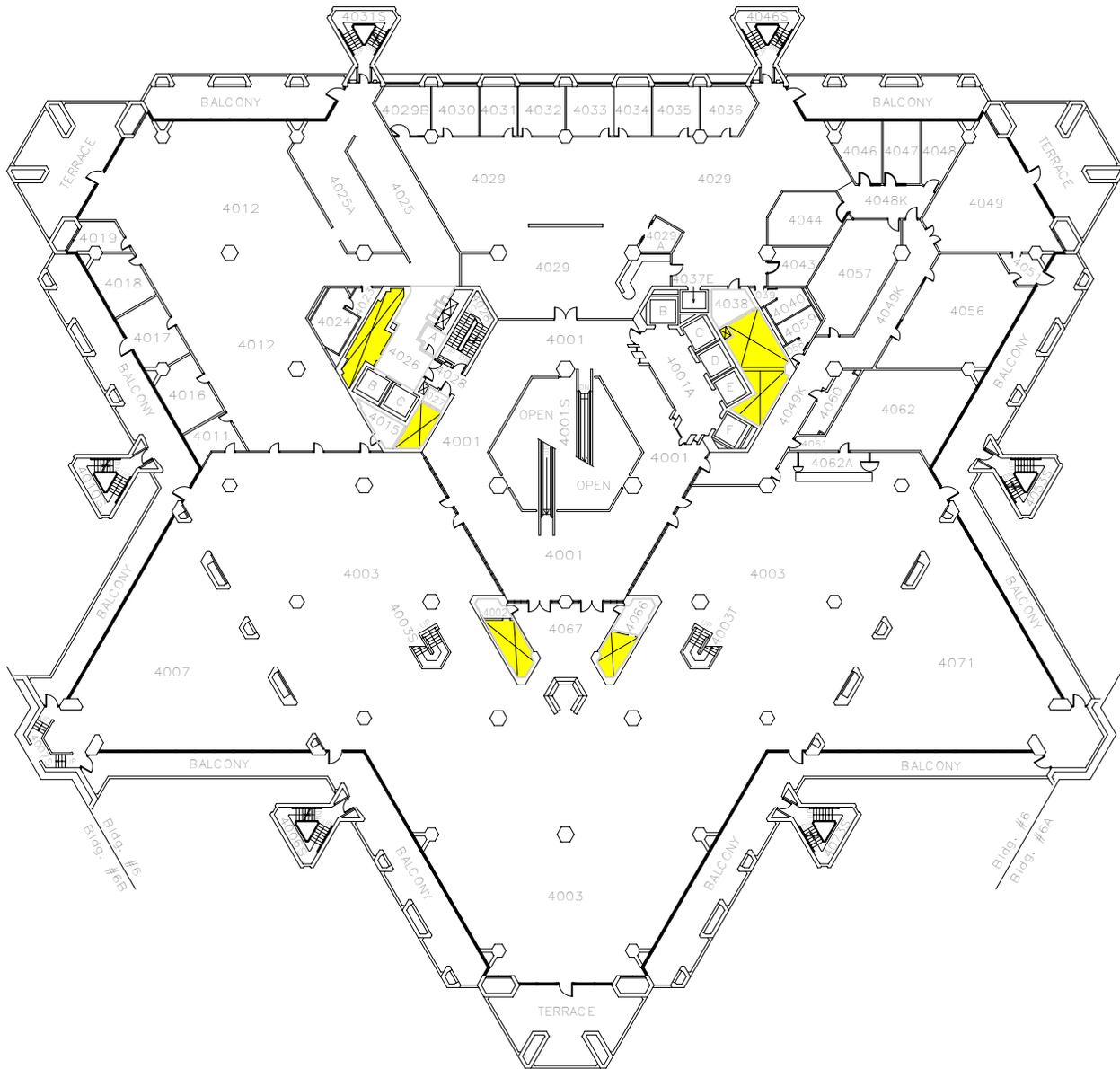
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THIRD FLOOR PLAN REV Feb 2014



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			Title: Floor Plan Showing the Locations of Asbestos-Containing Fireproofing	Project No:	
		Date:	Scale: NTS		
		Drawn:	Checked:		



FOURTH FLOOR PLAN REV Feb 2014



LEGEND:



Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

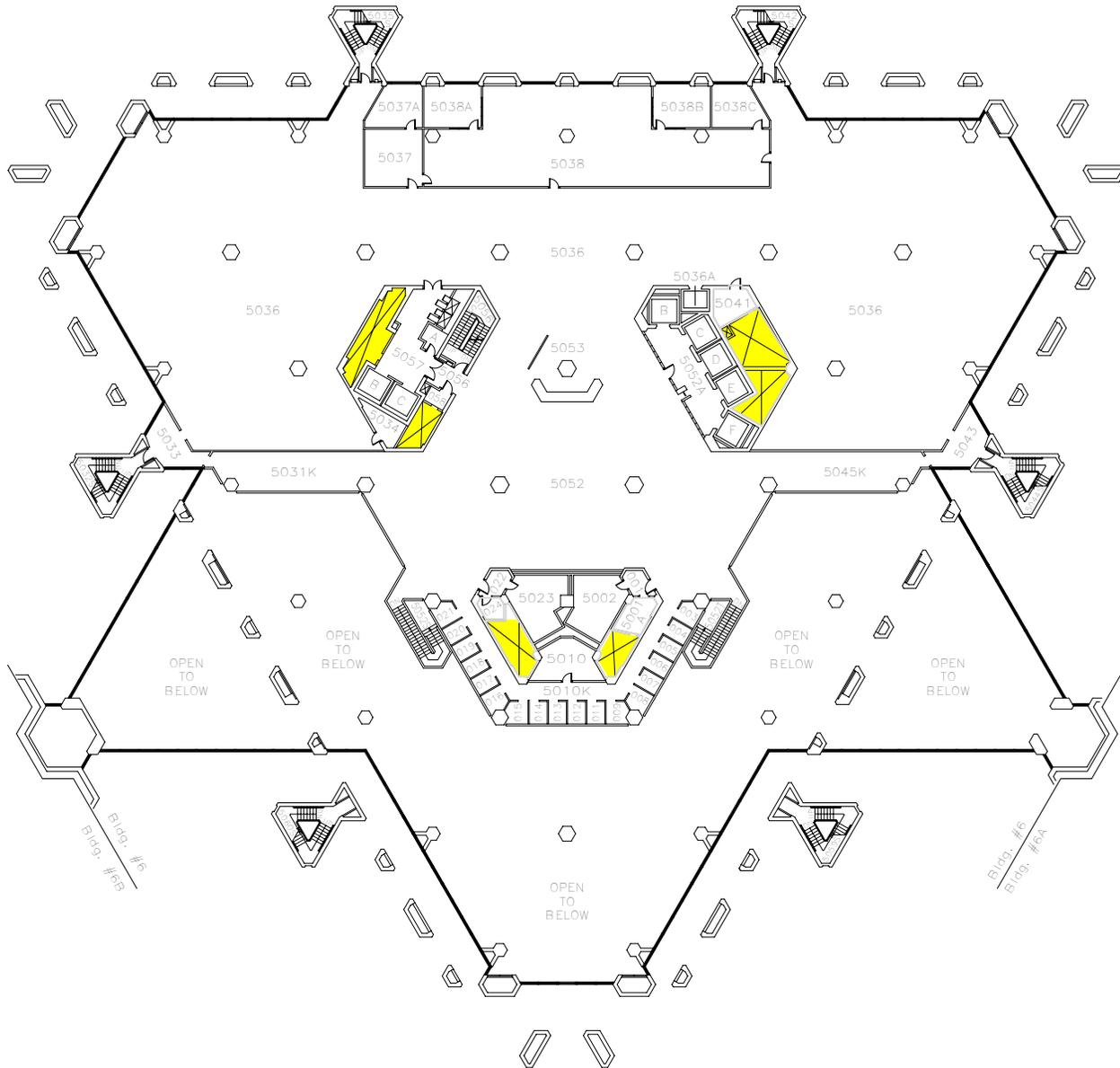
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Drawing No:

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FIFTH FLOOR PLAN REV Feb 2014

LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

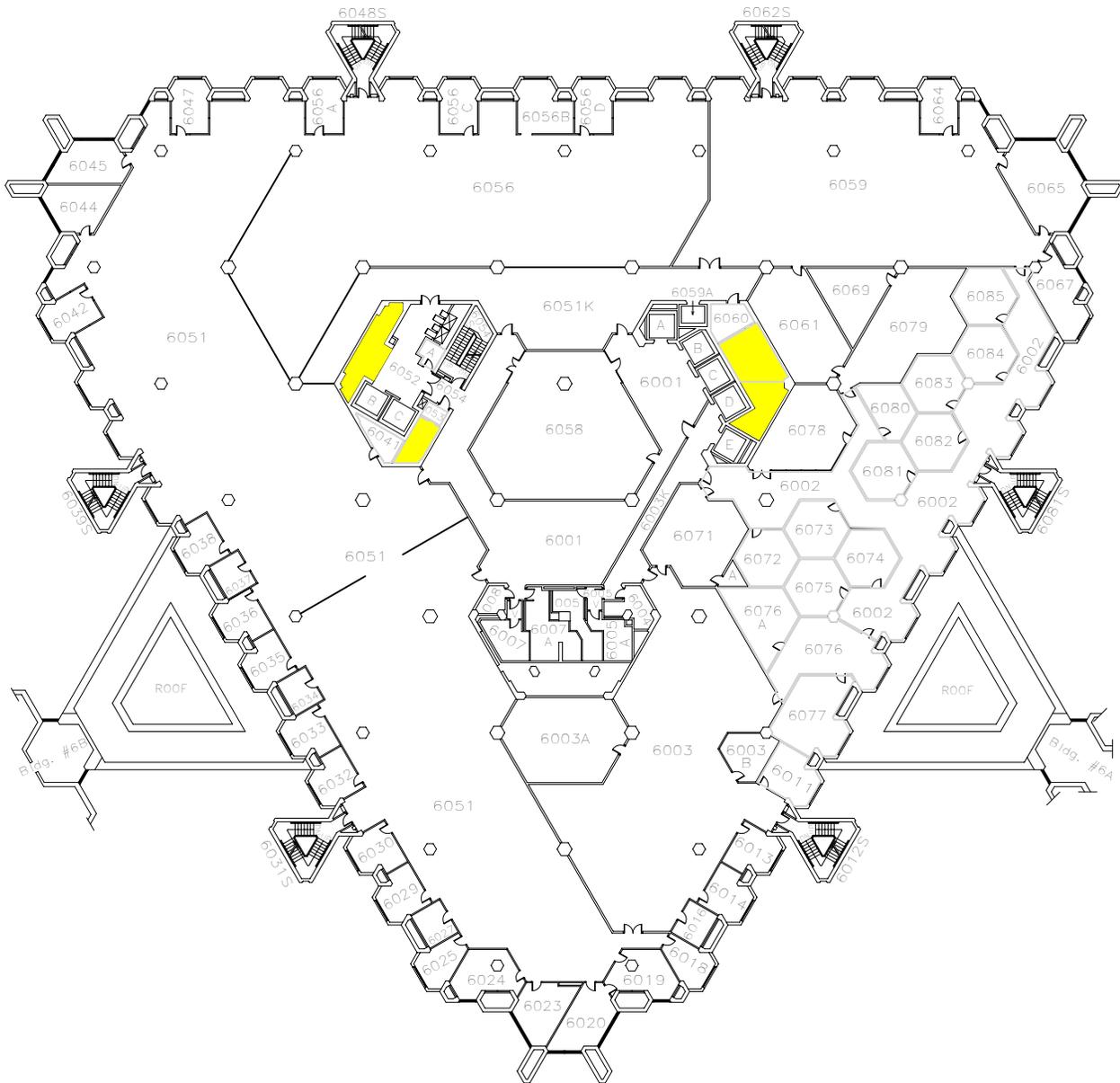
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Drawing No:

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SIXTH FLOOR PLAN REV Feb 2014



LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

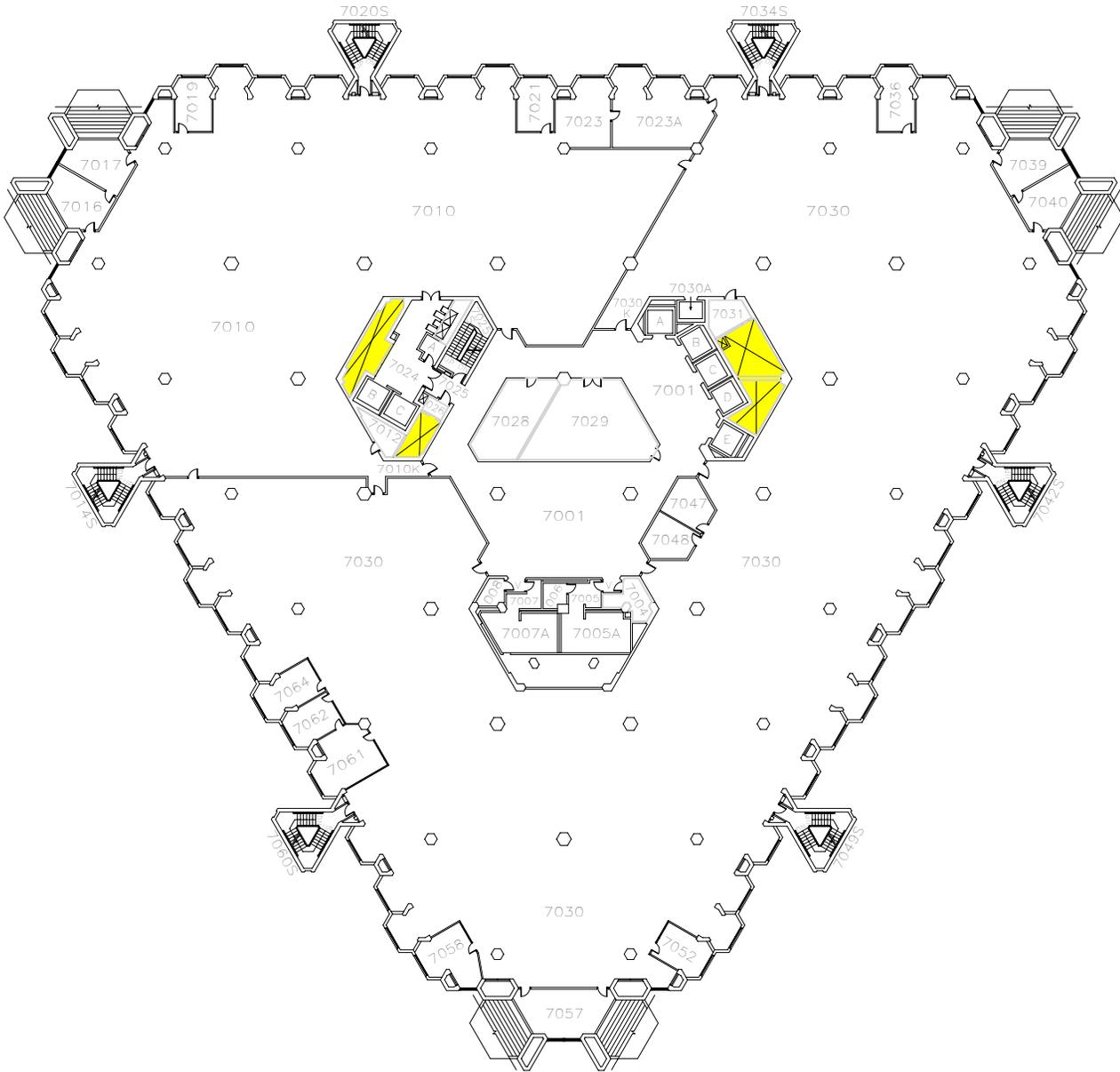
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Drawing No:

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SEVENTH FLOOR PLAN REV Feb 2014

LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

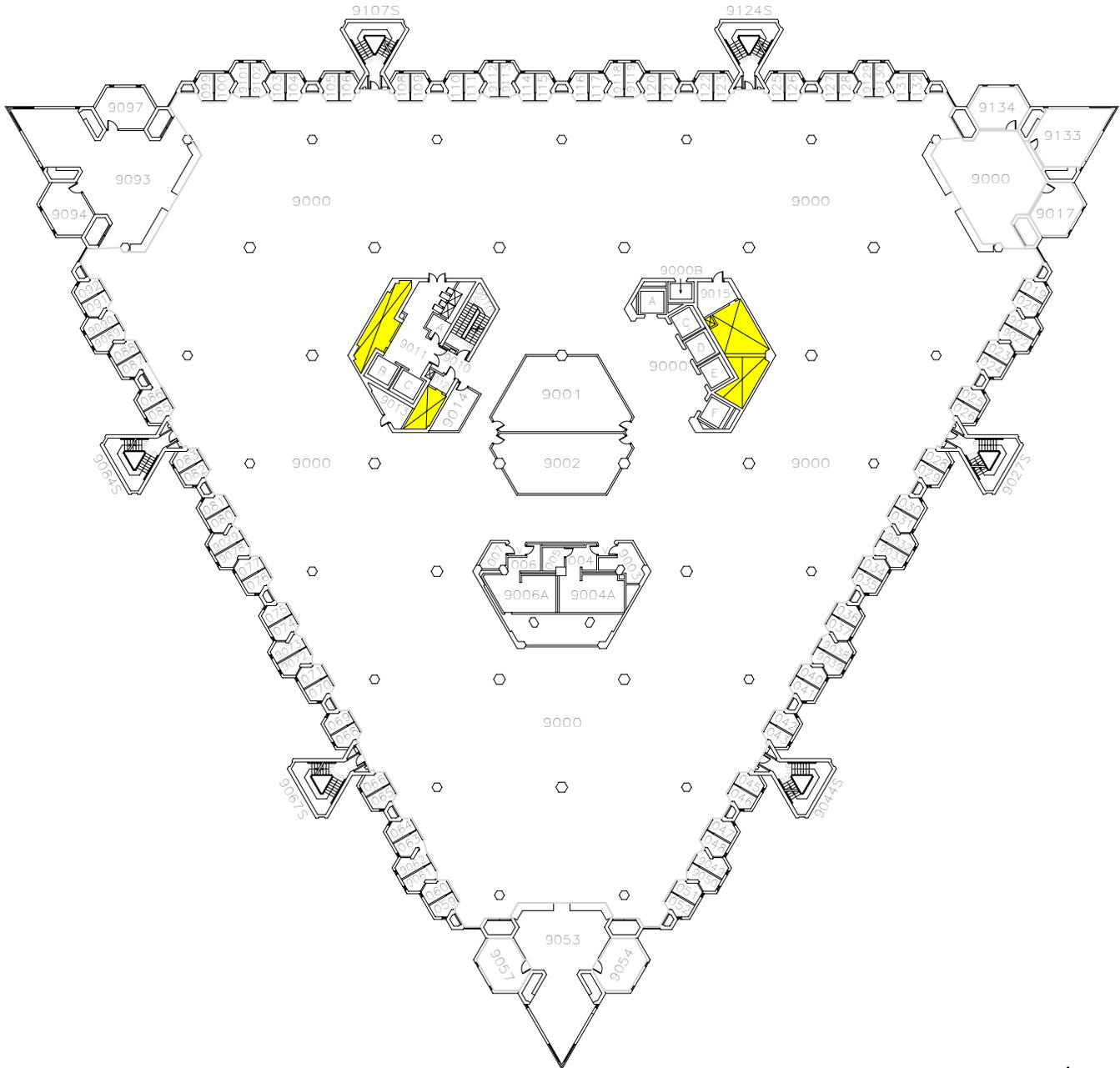
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Drawing No:

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NINTH FLOOR PLAN REV Feb 2014

LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

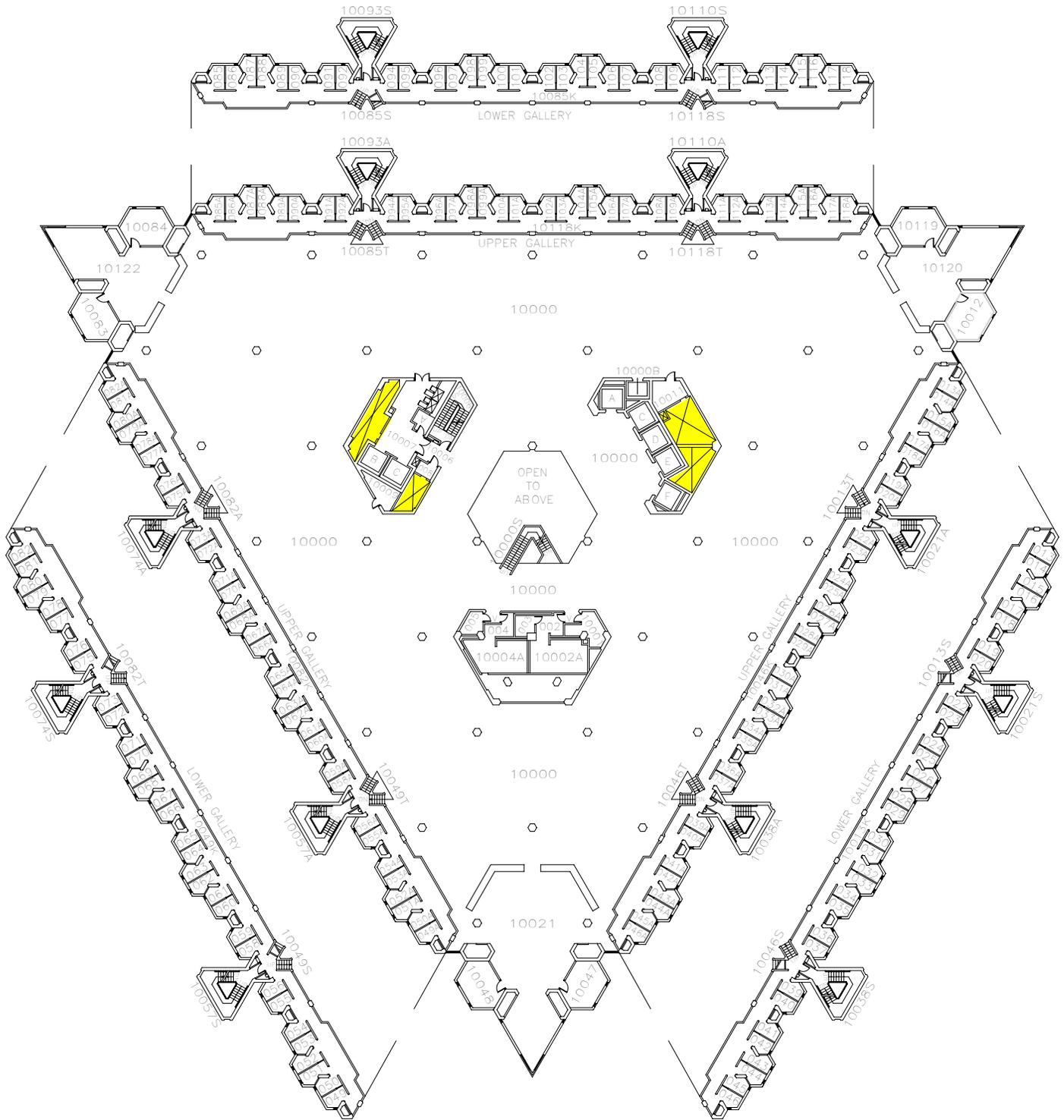
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TENTH FLOOR PLAN REV Feb 2014

LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

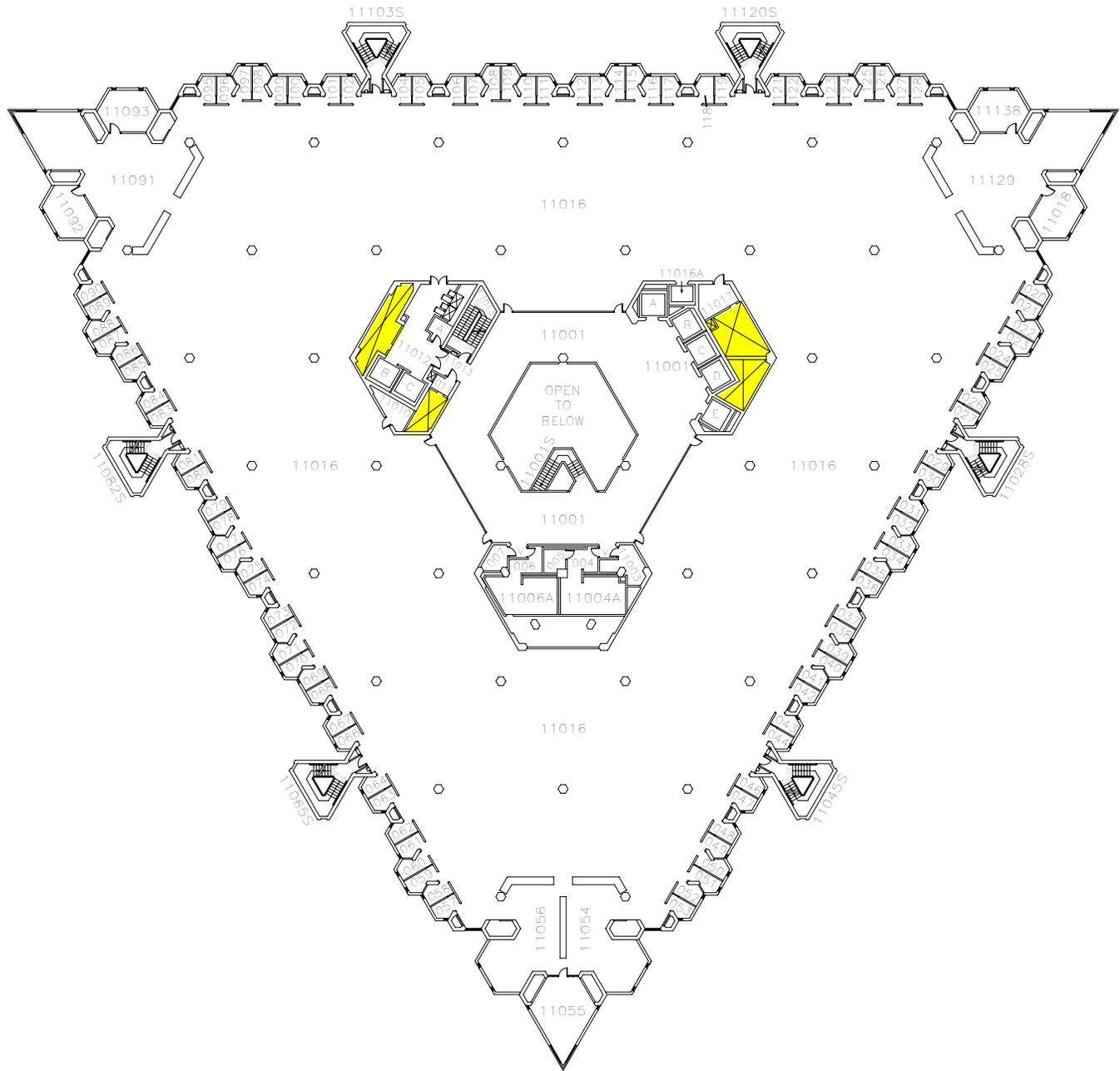
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ELEVENTH FLOOR PLAN REV Feb 2014

LEGEND:

 Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

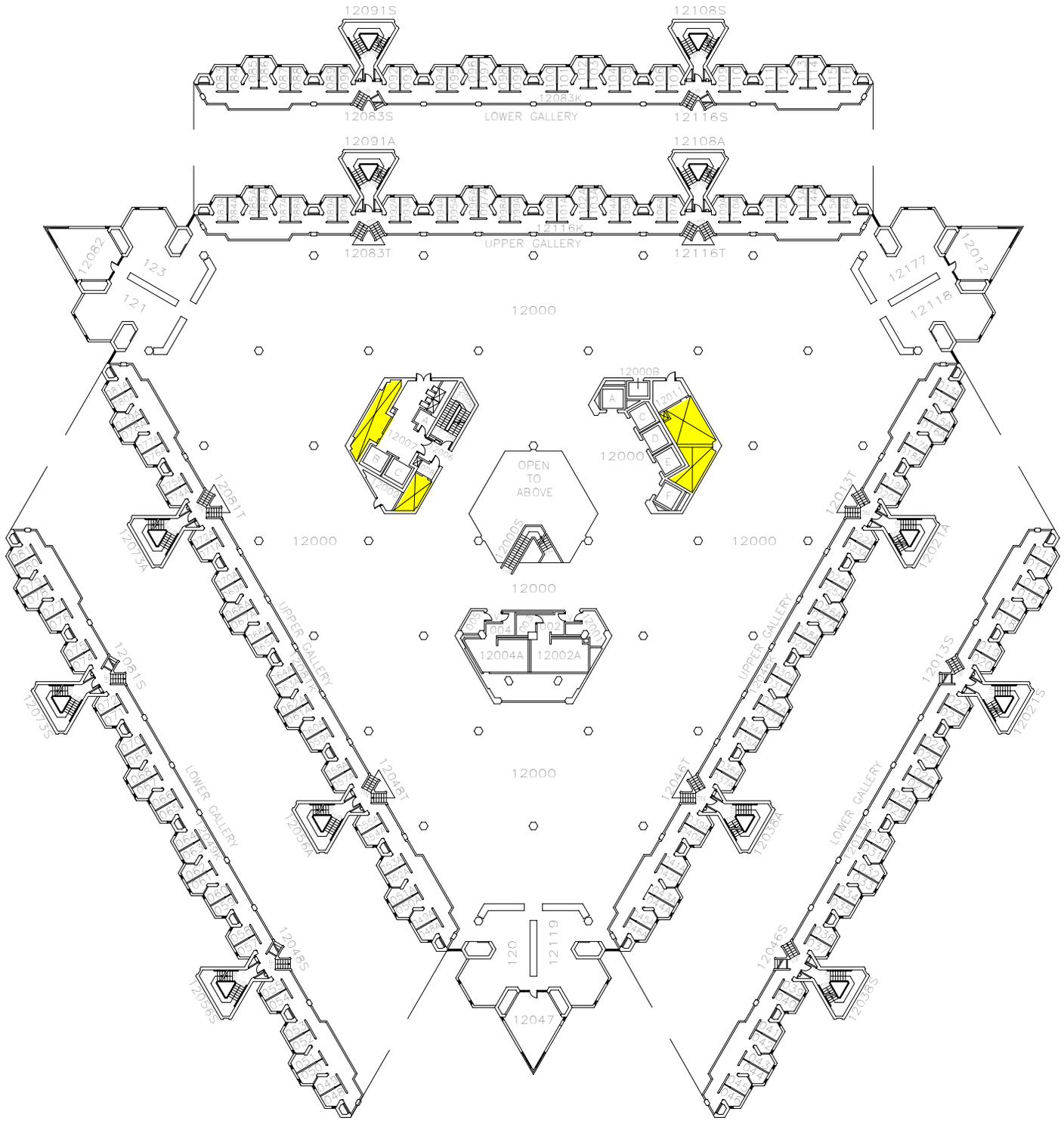
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Drawing No:

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TWELFTH FLOOR PLAN REV Feb 2014



LEGEND:



Asbestos-Containing Fireproofing

Location:
**John P. Roberts Research
 Library Building (Building # 006),
 130 St. George St., Toronto,
 Ontario.**

Title:
 Floor Plan Showing the Locations of
 Asbestos-Containing Fireproofing



University of Toronto

Date:

Project No:

Drawn:

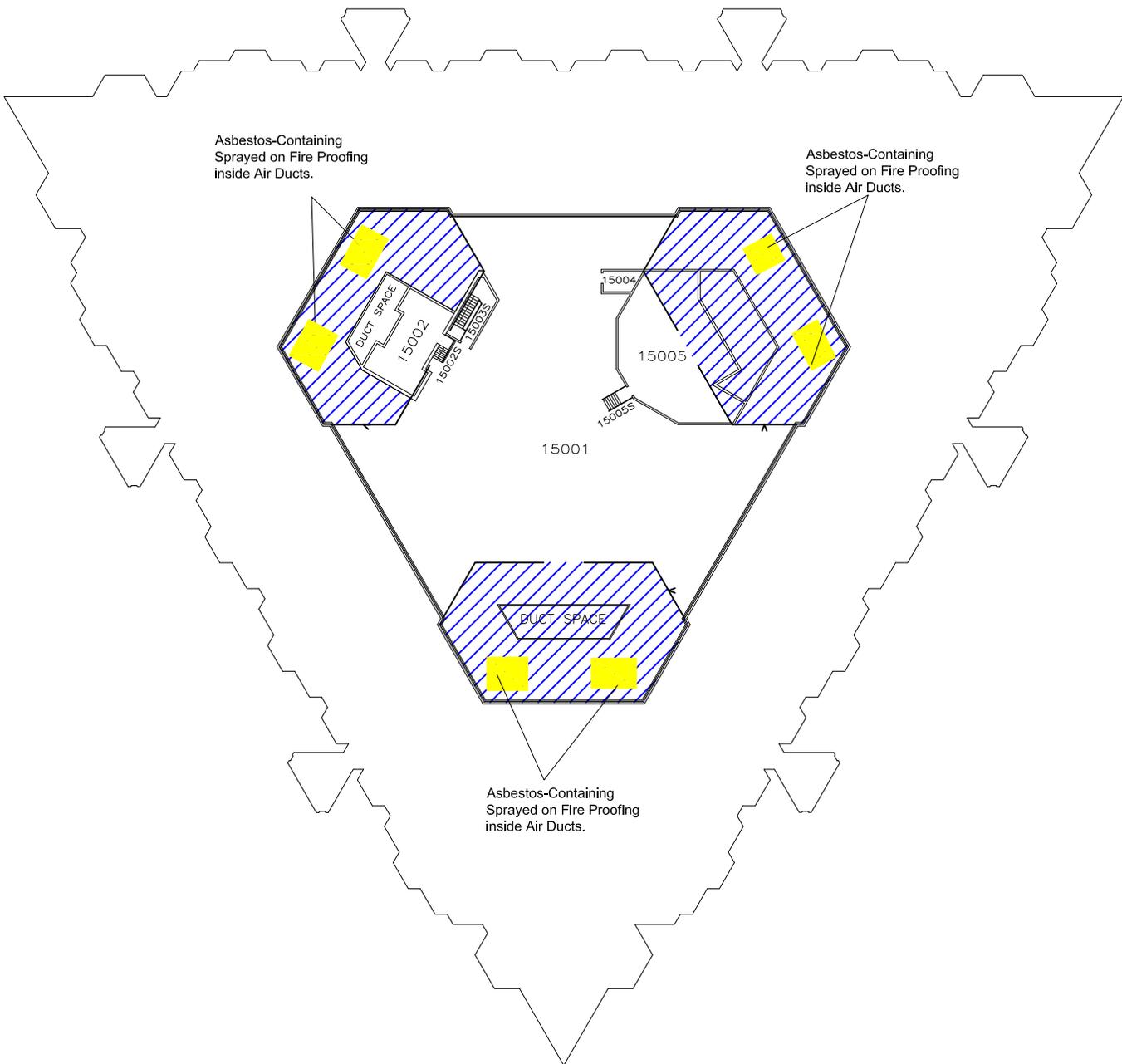
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PENTHOUSE FLOOR PLAN REV APRIL 2018



LEGEND:  Asbestos-Containing Fireproofing  Non-Asbestos Fireproofing	Location: John P. Robarts Research Library Building (Building # 006), 130 St. George St., Toronto, Ontario.		 University of Toronto	Drawing No: 1.17
	Title: Floor Plan Showing the Locations of Asbestos-Containing Fireproofing			
	Date:		Scale: NTS	
	Drawn:	Checked:		



APPENDIX B

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



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 etc. if not contaminated with asbestos.
- Inspection, checking metres, reading instruments etc.

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 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.

1.3 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.

1.4 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.



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.

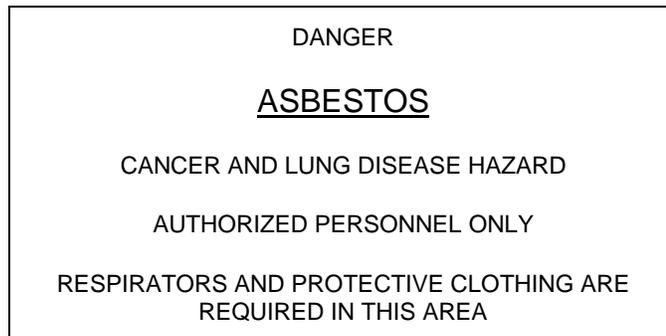
3.4 *Amended Water:* A mixture of water and a non-ionic, non-sudsing surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.

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.

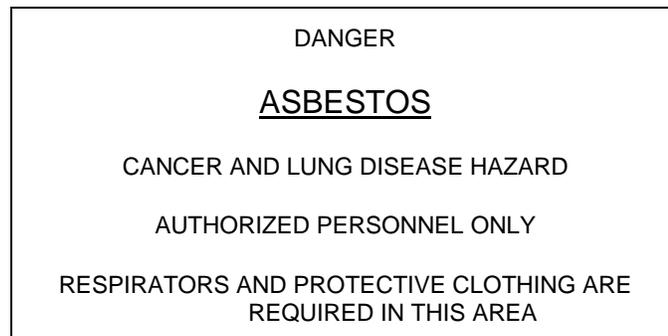
2.0 DEFINITIONS

- 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

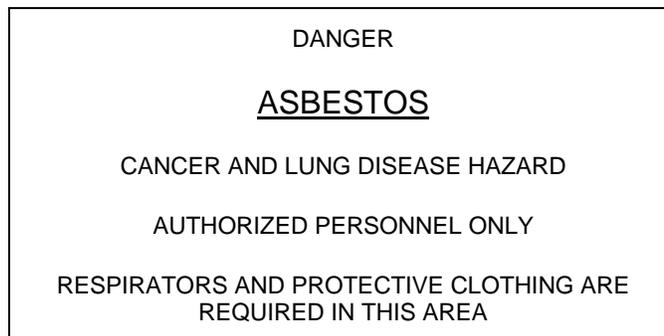
- 1.1 These procedures apply to all work involving the minor removal of friable asbestos-containing material; this activity may generate enough airborne asbestos to require protective equipment, but is of short duration..
- 1.2 Minor removal of material containing asbestos means the removal of **one 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 $R = \text{Radius of pipe and insulation}$).
- 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.