Frequently Asked Questions (FAQs) on Asbestos – St. George Campus

I would like to have clearance air testing/forced air testing performed in my lab (New FAQ April 5, 2017):

Our top priority is to provide a place that is safe for our faculty staff and students. To do that we've brought in experts to do regular tests of the air at the Medical Sciences Building because we know that asbestos is harmful when it is airborne. Those experts are using best practices to do those tests and they have found the building safe. The Ministry of Labour also has visited the site three times and they are satisfied with the steps we are taking.

We've been asked by some people why were are not doing other kinds of tests in the building. We are relying on the advice of experts and following industry best-practice.

Clearance air testing is defined in Ontario Regulation 278/05 and takes place under controlled conditions that does not reflect the building occupant's exposure to asbestos nor the exposure of asbestos workers inside the enclosure. Clearance testing takes place inside Type 3 enclosures after the abatement work is complete and after a thorough cleaning and a visual inspection by a Qualified Person. Forced air (a leaf blower) is then used to dislodge any remaining fibres in the enclosure. Clearance testing results are a measure of the effectiveness of Type 3 procedures and do not reflect occupational exposures. The clearance standard in Regulation 278/05 is 0.01 fibres/cubic centimetre (cc) (f/cc). The MOL has confirmed in their MOL field visit reports (https://ehs.utoronto.ca/wp-content/uploads/2017/03/MOL-Field-Visit-Report-March-27-2017-B.pdf that the requirements of 278/05, which includes the clearance limit, does not apply for ambient air sampling at MSB. It would only apply under the specific conditions set out above.

In Ontario, the regulated Time Weighted Average (TWA) exposure limit is 0.1 f/cc. Air sampling results are compared to this value.

It is also applicable and common health and safety practice to use an "action level" which is 50% of the TWA. This is not a regulated limit but an internal organizational practice which may be employed out of an abundance of caution. When airborne fibres are at 50% of the TWA, additional review takes place to validate the result. For asbestos, this often involves a second analytical method (Transmission Electron Microscopy Testing or TEM) which has the ability to distinguish asbestos from other fibres.

Ambient air sampling is conducted to evaluate potential exposure to asbestos. Therefore results are compared to the TWA exposure limit and the University's action limit, which is 50% of the TWA exposure limit.

Ambient air samples are collected during typical work and environmental conditions in the building.

The MOL does not prescribe a specific method for adjusting the OEL (Occupational Exposure Limit) to account for shifts >8 hours but in practice, a reduction is applied using various models. The most common model is to reduce the OEL proportionally. For a 12 hour work day (50% longer), reduce the OEL by 50% which brings us to the action limit we already use. Where airborne fibres appear to be higher than 50% of the OEL, a second analysis by (TEM) is performed. TEM has the ability to distinguish asbestos fibres. Where TEM analysis has been

performed, results were well below the occupational exposure limit. In fact, no asbestos fibres were detected in most of the samples analysed by TEM. Therefore; all air sampling results to date have been below 50% of the OEL for asbestos.

If you work or learn at MSB (New FAQs: March 30, 2017):

1. Am I safe if I go to work in MSB now?
   Except for those specific rooms which we have decided to close out of an abundance of caution while assessments are conducted, all operations and activities in MSB are to carry on as usual.

2. What do I do if I feel unsafe going to work at MSB?
   Except for rooms which have been closed, out of an abundance of caution while assessments are conducted, all activities in MSB may be conducted and carried out as usual.

   If you still have concerns, we encourage you to visit the EHS website, which contains a significant amount of helpful information including memos provided to occupants, instructions on how to access applicable reports and these FAQs.

   https://ehs.utoronto.ca/msb-information/

   After reviewing all of the information on the EHS website, should you still have concerns please speak with you supervisor and contact yangting.shek@utoronto.ca

3. Do I need to see a doctor because I worked (or am working at) MSB?
   You do not need to see a physician, but you are encouraged to seek medical advice if you wish. We encourage you to review all of the information at https://ehs.utoronto.ca/msb-information/. Should you have additional questions about your health and would like to discuss additional resources (including access to an Occupational Health Physician), please contact yangting.shek@utoronto.ca.

4. What if I still feel unsafe, should I proceed with a work refusal?

   Inspectors from the Ministry of Labour (MOL) have conducted site visits on three occasions: March 13, 22 and 27 with MSB JHSC representation present. To date, the MOL has not issued any directives to the university. Therefore, except for those specific rooms which the University has decided to close, out of an abundance of caution for further assessment, all operations and activities in MSB are expected to continue.
   All applicable, MOL reports are available on the Safety Board in MSB on the 2nd floor by the main elevators, through the MSB JHSC worker co-chair as well as https://ehs.utoronto.ca/msb-information/

   Should you have any additional queries please contact yangting.shek@utoronto.ca

   Please note: Workers have the right to refuse unsafe work at anytime pursuant to section 43 of the occupational health and safety act (OHSA).

   https://www.labour.gov.on.ca/english/hs/pubs/liveperformance/gl_live_refuse.php

(3) A worker may refuse to work or do particular work where he or she has reason to believe that,

(a) any equipment, machine, device or thing the worker is to use or operate is likely to endanger himself, herself or another worker;

(b) the physical condition of the workplace or the part thereof in which he or she works or is to work is likely to endanger himself or herself;

(b.1) workplace violence is likely to endanger himself or herself; or

(c) any equipment, machine, device or thing he or she is to use or operate or the physical condition of the workplace or the part thereof in which he or she works or is to work is in contravention of this Act or the regulations and such contravention is likely to endanger himself, herself or another worker.

Upon refusing to work or do particular work, the worker shall promptly report the circumstances of the refusal to the worker's employer or supervisor and contact yangting.shek@utoronto.ca

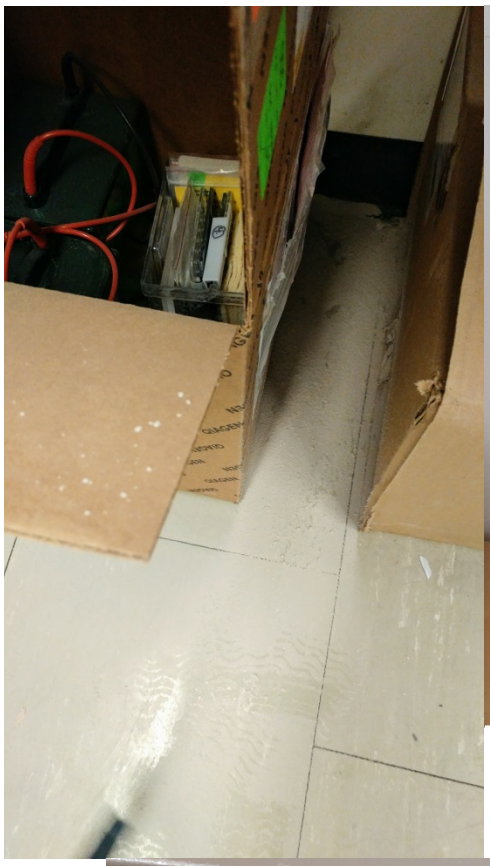
5. What is my responsibility as a faculty member under the OHSA when I am supervising workers?

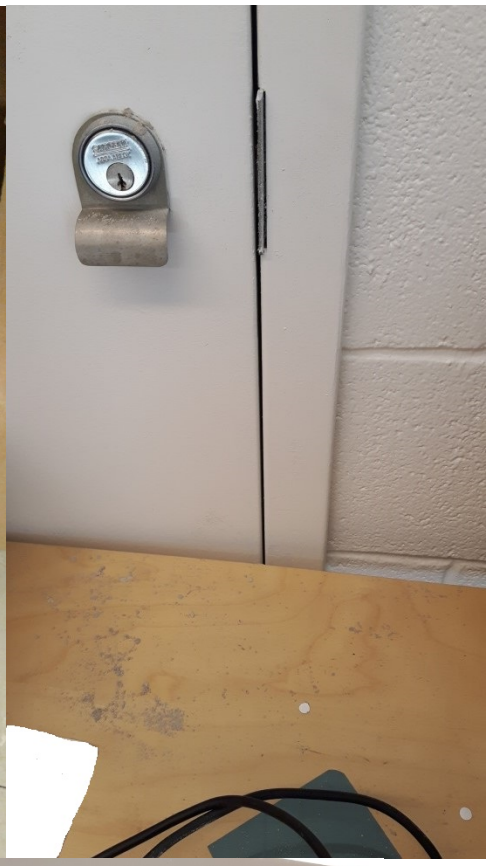
   The Occupational Health and Safety Act (OHSA) establishes obligations on a number of workplace parties - employers, workers, owners, supervisors and on a union through its role in the Joint Health and Safety Committees. The roles played by each of these workplace parties mesh together under what the Ministry of Labour refers to as the "Internal Responsibility System". While there may be individual obligations, the intention is that workplace safety is enhanced through the interaction of all workplace parties.

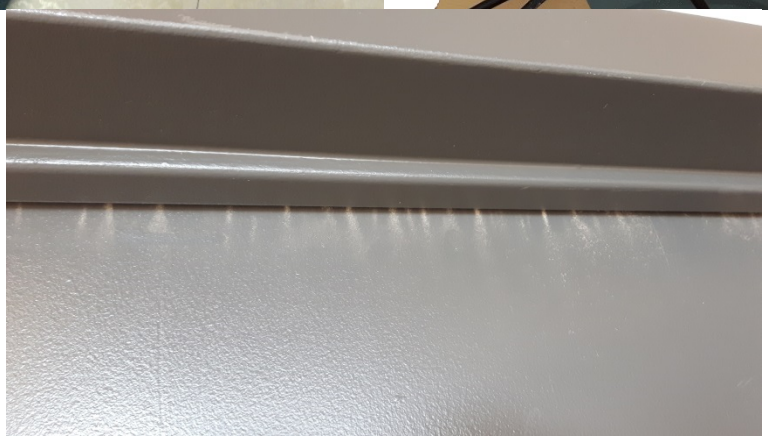
   Faculty members undertake a variety of roles, some of which may involve responsibilities under the OHSA. Under the OHSA faculty members may be in the role as a supervisor in certain circumstances and for certain staff or students they may oversee and/or instruct where the facts are such that these individuals are treated as workers under the legislation. Under OHSA supervisors have legal obligations, among other things, to take every precaution reasonable in the circumstances for the protection of a worker and to advise a worker of the existence of any potential or actual danger to the health or safety of a worker of which the supervisor is aware. In the case of buildings that contain asbestos and that are regulated under the relevant regulations pursuant to OHSA, the employer of the supervisor (i.e. the University) plays the primary role for ensuring that supervisors are aware of the existence of potential or actual dangers. The University will continue to provide information to the relevant workplace parties with respect to asbestos. Information will continue to be posted on https://ehs.utoronto.ca/msb-information/ and additional queries can be directed to yangting.shek@utoronto.ca.

6. What does asbestos look like/what should I be looking out for?

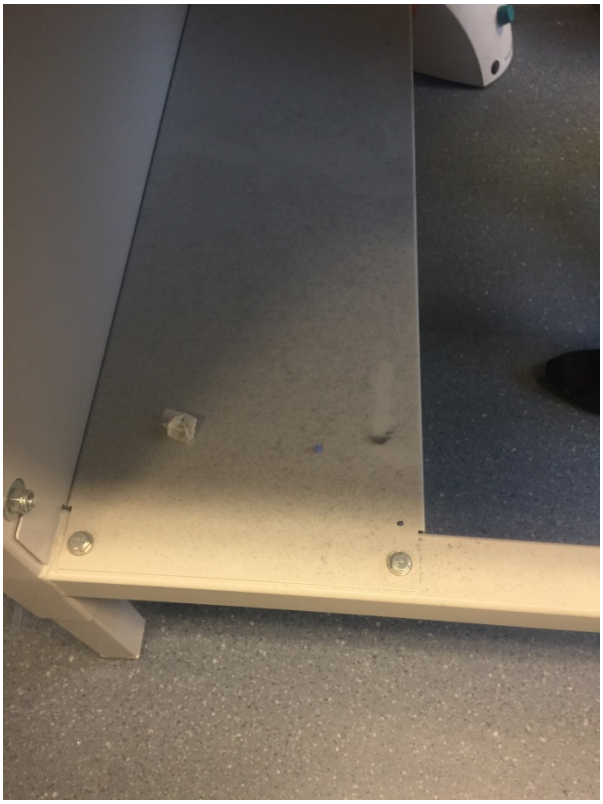
   Cementitious Asbestos-Containing Powder: Homogenous, whitish / grey, very fine powder in an unusual concentrated distribution. (*Please note the powder in the photos below come from abatement sites, not construction sites*)







Regularly occurring dust: “Dust bunnies”, Non-homogenous, grey or grey black, “furry” usually found evenly distributed over a large area, but will clump in corners, or near electrostatic sources.



7. How do you test for asbestos?

Dust samples are checked visually and scanned under a stereomicroscope for asbestos. Slides are prepared and observed under a Polarized Light Microscope (PLM) at magnifications of 40X, 100X or 400X as appropriate. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the percentage of asbestos present. Building materials containing >0.5% asbestos is classified as asbestos-containing per Ontario Regulation 278/05. Some materials may have <0.5% asbestos containing material. This means there are only trace quantities of asbestos fibres, limited to only a few fibres or fibre bundles. Building materials with <0.5% are not classified as asbestos containing and no additional precautions are required with respect to asbestos.

Air samples are tested initially using Phase Contrast Microscopy (PCM) in accordance with NIOSH method #7400A. Samples are collected on a cellulose ester membrane filter with 0.8 micrometre pore size and 25 millimetre diameter. The filter is mounted inside a three piece filter cassette with two inch conductive cowl. The PCM identifies the amount of fibres present in the air based on size and dimension. In Ontario, the Time Weight Average (TWA) exposure limit for asbestos is 0.1 fibres/cm^3 (cubic centimeter). If the PCM detects 50% of the exposure limit (0.05 fibres/cm^3), a secondary test –

Transmission Electron Microscopy (TEM) – is conducted to differentiate the types of fibre collected, including asbestos.

8. How is exposure to asbestos assessed?

   Asbestos is a respiratory hazard. Therefore air sampling is used to evaluate exposure because the results reflect fibres that are in the air and have the potential to be inhaled.

9. Are there occupational exposure limits for asbestos?

   Yes. In Ontario, the regulated Time Weighted Average (TWA) exposure limit is 0.1 fibres/cubic centimetre (cc). Air sampling results are compared to this value.

   It is also common practice to use an "action level" which is 50% of the TWA. This is not a regulated limite but an internal practice. When airborne fibres are at 50% of the TWA, additional review takes place to validate the result. For asbestos, this often involves a second analytical method called Transmission Electron Microscopy (TEM) which have the ability to distinguish asbestos from other fibres. More information about TEM is available in #6.

10. What if the air sampling result in my office is higher than other nearby areas but less than 50% of the TWA? Is my health at risk?

    No. The airborne concentration is still well below the TWA exposure limit. No additional cautions are necessary. Fibres may be higher due to the influence of non-asbestos fibres or particulates. Contact yangting.shek@utoronto.ca if you require further assistance.

11. What is the difference between air sampling and clearance testing?

    Ambient air sampling is conducted to evaluate potential exposure to asbestos. Therefore result are compared to the TWA exposure limit and the University's action limit, which is 50% of the TWA exposure limit. Ambient air samples are collected during typical work and environmental conditions in the building.

    Clearance air testing is defined in Ontario Regulation 278/05 and takes place under simulated conditions that does not reflect the building occupant's exposure to asbestos nor the exposure of asbestos workers inside the enclosure. Clearance testing takes place inside Type 3 enclosures after the abatement work is complete and after a thorough cleaning and a visual inspection by a qualified person. Forced air (a leaf blower) is then used to dislodge any remaining fibres in the enclosure. Clearance testing results are a measure of the effectiveness of Type 3 procedures and do not reflect occupational exposures.

Further health and safety-related questions (#5,6,7,11,12 and 13) remain in the original FAQ, below, posted March 23rd:

General Information about Asbestos

1. What is asbestos?

   Asbestos is a general term given to a group of naturally occurring mineral silicates that are made up of long thin fibres. These fibrous minerals were used in a wide range of products in construction and industry, because of their unique properties which include heat resistance, chemical resistance, and heat and electrical insulation.

2. Why do UofT buildings have asbestos?

   Asbestos is not unique to University of Toronto buildings. Asbestos is found in many buildings built after World War II in Canada and internationally. This includes hospitals, schools, government buildings, banks, commercial properties and residential homes.

   Due to its unique physical and chemical properties, asbestos was added to a wide variety of products to strengthen them, to provide heat or electrical insulation, to offer fire or chemical resistance, and/or to absorb sound. Many building materials manufactured during the peak years of use (WWII to the 1980s) such as sprayed fire-proofing, thermal insulation, ceiling tiles, floor tiles, electrical insulation and roofing materials contain asbestos.

3. I heard asbestos is naturally in the air. Is this true?

   Asbestos is a geological mineral and fibres are naturally occurring. As a result, it is present in ambient outdoor air. This, combined with the widespread use of asbestos in products such as automotive brake linings, means that we are all exposed to very small amounts of asbestos in our daily lives. Asbestos fibres can also be found in drinking water.

4. What is friable asbestos material?

   "friable material" means material that,

   (a) when dry, can be crumbled, pulverized or powdered by hand pressure, or

   (b) is crumbled, pulverized or powdered;

5. I work in a building that contains asbestos. Should I be concerned?

   Extensive studies have been conducted in buildings containing asbestos have not shown an elevated risk to occupants simply working in a building with asbestos.

6. I heard that sometimes family members can get asbestos-related illnesses. Should I be worried for my family if I work in a building with asbestos?

   Studies have shown that family members of asbestos workers (e.g. construction, trades, shipyards) may be at risk of contracting illnesses but not those simply occupying a building that contains asbestos.

7. Is exposure to 1 (one) fibre sufficient to cause asbestos-related illnesses?

   Available scientific literature has consistently shown that asbestos-related disease are caused by high levels of asbestos over an extended period of time and that they primarily affect workers in certain industries such as construction, trades, shipyards, factories and asbestos mining. Also, asbestos is naturally in the air. So on a daily basis, all people are being exposed to small amounts of asbestos.

8. What should I do if I encounter broken or damaged building materials in my work area is damaged?

   Do not disturb the material. Leave the area. Call 416-978-3000 during regular business hours and Campus Police at 416-978-2222 during non-business hours.

   If you believe you have been exposed to asbestos dust or debris, please report it immediately to your supervisor. Your supervisor will complete an online incident report form and submit it to the Office of Environmental Health and Safety (EHS) for follow up. Students should report to their academic supervisor who can complete the online incident report on their behalf. EHS can also be contacted at 416-978-4467.

   Online incident report forms are available here: https://ehs.utoronto.ca/report-an-incident/

9. I work in a building with sprayed asbestos fire-proofing. What should I do if a ceiling tile falls down?

   Do not disturb the material. Leave the area. Call 416-978-3000 during regular business hours and Campus Police at 416-978-2222 during non-business hours.

10. What if I need to make changes to my workspace, such as installing new furniture, shelving, alarms, etc.? How can this be done safely if asbestos is in so many building materials?

    Any work that causes disturbance (e.g. drilling, screwing in, cutting, grinding, scraping, demolition) of the building fabric (e.g. walls, ceilings, flooring) should be vetted through a UofT facilities and/or property management contact to ensure that Designated Substances such as asbestos are identified ahead of time. This ensures appropriate work procedures are used if asbestos, or other Designated Substances, are present. Occupants should not perform repairs, maintenance or new installations on their own.

11. How is asbestos exposure determined?

    Asbestos is a respiratory hazard. Air sampling is the most relevant and recognized way to assess exposure to asbestos.

12. What is the role of the Joint Health and Safety Committee (JHSC) when an asbestos incident has occurred?

    The JHSC plays an important role in the internal responsibility system as set out by the Ontario Occupational Health and Safety Act. Employees may contact the JHSC with queries which they can help facilitate by conveying questions and concerns to the relevant UofT

party/unit. The JHSC is also notified of any air sampling that may take place to evaluate asbestos exposure and a copy of the air sampling results are provided to the JHSC.

Asbestos Management During Construction Projects, Maintenance and Repairs

1. Does the University identify asbestos prior to a Construction Project?

   Yes, as required by Ontario regulation, the University maintains a comprehensive inventory of asbestos-containing materials (ACM) present in University buildings. The inventory is part of a report called "Asbestos-Containing Building Materials Survey Report". The survey report provides an overview of asbestos in a building. These survey reports are available online at https://asbestos.fs.utoronto.ca/
   During the planning phase of a Construction Project, the scope of the project is reviewed in detail (for example, which walls, floor tiles, ceilings, etc. will be removed) and a Designated Substances Report, which includes asbestos, that is specific to the project is generated. Additional samples are collected and analyzed for the project as needed.

2. Who is responsible for ensuring a Designated Substances Report is produced?

   The person who is tendering or contracting out the work is responsible for providing this report to prospective Contractors during the tendering process, prior to signing of contracts. This ensures the Contractor knows of the location of asbestos in the building prior to bidding on the work. The Contractor is responsible for providing this information to their employees and other subcontractors they may engage for this project.

3. What happens to the Designated Substances Report once it is produced?

   The person who is tendering or contracting out the work is responsible for providing this report to prospective Contractors during the tendering process, prior to signing of contracts. This ensures the Contractors know of the location of asbestos in the building prior to bidding on the work. The successful Contractor is responsible for providing this information to their employees and other subcontractors they may engage for this project.

4. How do we ensure asbestos abatement Contractors have the training and knowledge to handle asbestos in a safe manner both for themselves and for building occupants?

   The Project Management Group prequalifies abatement contractors upon a thorough confirmation of financial capabilities, previous completed projects, experience of working in educational institutes, membership and reputation with the WSIB, workers training, health & safety policy and industry references.

   The contract between the University and the Contractor outlines the requirements the Contractor must follow. This includes working in compliance with Ontario regulation with respect to asbestos and/or the University of Toronto Asbestos Management Program (AMP) (whichever is more stringent) and requiring the contractor's employees and supervisor to have completed asbestos training. The contract also requires the Contractor to provide proof of training for their employees who are sent to UofT. For Type 3 work (see below), a third

party consultant is engaged to regularly inspect the enclosure where the asbestos abatement work is taking place.

5. How is asbestos abatement planned to ensure the right procedures are being followed?

   During the planning stage of a construction project, the asbestos abatement work is classified as either Type 1, 2 or 3 asbestos abatement work. The "Type" of work is defined by Ontario Regulation 278/05with Type 1 being the lowest risk, then up to a Type 3. Once the work is classified, the Contractor is required to follow procedures as out lined in the Ontario Regulation or the University of Toronto Asbestos Management Program (whichever is more stringent) .

6. What is the difference between Type 1, 2 and 3 abatement work?

   Asbestos work is categorized into Type 1, 2 and 3 work depending on the level of risk. Type 1 work is low risk, Type 2 is moderate risk and Type 3 is higher risk. The level of precautions, therefore, increases for each type of work. Here are some examples of each type of work:

   Type 1 asbestos work:

   - installation or removal of ACM (asbestos containing material) ceiling tiles (less than 7.5 m^2) without being broken, cut, drilled, abraded, ground, sanded or vibrated ;
   - installation or removal of non-friable ACM, other than ceiling tiles and vinyl floor tiles, without damage;
   - breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable ACM that is wetted and where the work is done using non-powered hand-held tools; and,
   - removal of less than one square metre of drywall where ACM joint-filling compounds were used.

   Type 2 asbestos work:

   - the removal of all or part of a false ceiling to access a work area, if ACM is likely to be lying on the surface of the false ceiling;
   - removal or disturbance of one m2 or less of friable ACM
   - enclosing friable ACM;
   - removal of non-friable ACM vinyl floor tiles
   - application of tape, a sealant or other covering to pipe or boiler insulation that is ACM;
   - installing or removing ACM ceiling tiles that cover an area of 7.5 m2 or more if the work is done without damaging the tiles;
   - breaking, cutting, drilling, abrading, grinding, sanding, or vibrating non-friable ACM using non-powered hand-held tools if the material is not wetted;
   - cleaning or removing filters used in air handling equipment in a building that has sprayed ACM fireproofing;
   - removal or disturbance of one square metre or less of friable ACM during the repair, alteration, maintenance or demolition of all or part of machinery or equipment or a building, aircraft, locomotive, railway car; and
   - glove bag removals of ACM insulation.
   - Drilling holes into non-friable ACM material

Type 3 work:

- removal or disturbance of more than one square metre of friable ACM;
- spray application of a sealant to friable ACM;
- cleaning or removal of air-handling equipment, including rigid ducting but not including filters, in a building that has sprayed ACM fireproofing;
- repair, alteration or demolition of a kiln or furnace made, in part, of refractory materials that are ACM;
- breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable ACM with power tools not attached to dust-collecting devices with HEPA filters.

7. How do procedures vary between Type 1, 2 and 3 asbestos work?

   As the risk to abatement workers increases from Type 1 to Type 3 operations, the protective measures and procedures become increasingly stringent. In general, there are five (5) important elements: preparation of work area, dust control, personal protective equipment, clean-up of work area and asbestos waste removal.

   To put things into perspective, respiratory protection is not required, but is optional, for workers performing Type 1 work. Type 2 work requires respiratory protection and, depending on the level of activity, may require the use of enclosures and isolation of ventilation system. Some requirements for Type 3 work are listed below.

8. What are examples of procedures that take place for higher risk Type 3 work?

   Full requirements are outlined in Ontario regulation 278/05 with respect to asbestos. Some examples are:

   - More stringent training for workers.
   - Ventilation shutdown and sealing air supply and exhaust in/out of the asbestos work area.
   - Performing work within an enclosures that is under negative pressure.
   - Enclosing the work space with polyethylene sheeting to prevent migration of fibres/dust from the abatement area to adjacent areas.
   - The enclosure includes a shower facility which all workers must use prior to leaving the enclosure and entering public corridors. Workers are only allowed to enter public hallways after showering and wearing regular street clothes.
   - All tools, equipment, including personal protective equipment (PPE), used during the asbestos abatement work are left inside the enclosure.
   - All discharged air from inside the enclosure passes through a negative air pressure machine equipped with a HEPA (High Efficiency Particulate Aerosol) filter at least 99.97 percent efficient in collecting the smallest fibres/particles from the air. The negative air machine is tested prior to use to ensure that the machine will work properly during the abatement.
   - Engaging a third-party consultant to inspect enclosures on a regular basis and conducting clearance air-testing prior to dismantling the enclosure.

For the Type 3 abatement work that is currently occurring in MSB, a third party consultant has also been engaged to collect ambient air samples (which differs from clearance air testing) outside of the enclosure in adjacent work areas. This is not required by law but is a procedure the University has been proactively following to monitor the asbestos work.

9. Who is the contact if my workplace has been impacted by a Construction Project?

   UofT employees should report their concerns to their supervisor who will then follow up with the appropriate party. Depending on the organizational structure of the department, this may mean expressing the concern with a building/facilities contact who would then follow up with the Project Manager. The Project Manager investigates and reviews the issues with the Contractor.

   For matters that require immediate attention (e.g. flood, fallen ceiling tile that exposes the asbestos sprayed fireproofing above, etc.), employees should call 416-978-3000 during regular business hours and Campus Police at 416-978-2222 during non-business hours.

10. What is the role of the Hazardous Construction Materials Group (HCMG)?

    Provide services and oversight of the administration, implementation and enforcement of the Asbestos Management Program (AMP).

    Administer, implement and monitor the requirements of the AMP for all asbestos work, or activities which may disturb asbestos-containing materials, planned or unplanned.

    Work in close liaison with all divisions who may be involved with asbestos-related work to ensure compliance with the AMP.

    Maintain an on-line Asbestos Inventory of all buildings with asbestos-containing materials, and update the inventory at least once in each 12 month period.

    Ensure that ACM fireproofing locations are identified or labeled according to established requirements and to ensure that appropriate signage is posted.

    Provide the Designated Substances Report to departments that may be authorizing or tendering work that may involve removal or disturbance of asbestos-containing materials.

    Ensure that the Ministry of Labour, Construction Health and Safety Branch, is notified of certain Type 2 and Type 3 asbestos abatement work

11. What is the role of the Office of Environmental Health and Safety (EHS)?

    EHS maintains the Asbestos Management Program, which outlines the requirements that must be followed by each party at the University, including those involved in Construction Projects. As outlined above, Contractors are required to following the AMP and/or Ontario regulation, whichever is more stringent.

    EHS develops and provides training on asbestos to employees. All employees who engage in Type 1 and 2 asbestos training and respiratory protection training before performing

asbestos-related repair and maintenance work. Asbestos awareness training is also available in the UofT community who would like to learn more about asbestos.

12. Who do I contact if I have personal health concerns related to asbestos?

    EHS may also be contacted if employees and students have concerns regarding health and safety. In general UofT employees should first report their concerns to their supervisor. In the case of a student, concerns should be reported to a UofT contact (e.g. academic supervisor, administrative unit manager).

13. What about UofT staff who performs asbestos work?

    Some facilities staff at UofT perform limited Type 1 and 2 work only. Supervisors of these employees scope out the work and provide written information of asbestos-containing materials ahead of time. These employees also receive training from EHS prior to qualifying to do any asbestos work. Written procedures (Standard Operating Procedures, SOPs) are available to ensure that proper procedures are being followed.