WESTERN UNIVERSITY

OCCUPATIONAL HEALTH AND SAFETY

ASBESTOS CONTROL PROGRAM

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NOTE: As at December 2024, this program is under review and will be updated. Questions may be directed to hsw@uwo.ca.

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1.0 INTRODUCTION AND SCOPE

Western University owns sixty-eight buildings, seventeen of which have been sprayed with Asbestos Containing Materials (ACM). Asbestos was once commonly used for commercial and household applications. Asbestos was most frequently used because of its fire-resistant properties, in both ships and buildings, as insulation wrapped around heating pipes and boilers, in ceiling coatings, in thermal acoustic insulating boards, and in cement cladding and pipes. In 1973, the use of asbestos in sprayed-on insulation was prohibited in Ontario.

Asbestos is dangerous only if it is in a friable state (easily crumbled by hand pressure) because loose fibres may be inhaled. If the asbestos is located in a traffic area, and if it is easily moved or dislodged, there is a threat of exposure. If it cannot be disturbed, for instance, if it is contained above a ceiling and in a good condition, or is a component in an asbestos cement floor, the risk of exposure is considered negligible. Ontario's Royal Commission examined the issues related to exposure to asbestos, including its use in buildings. In its 1984 report on the Use of Asbestos, the Commission stated that "even in those buildings which contain friable asbestos insulation, the possibility of a health risk is largely limited to situations where work will disturb this asbestos."

Ontario Regulation 278 addresses asbestos use on construction projects and in building and repair operations. It requires that when material containing asbestos has been used in a building as fireproofing or in construction products, the owner must maintain a record of that material and advise workers who might disturb the material. The owner must have a training program for all workers who might work on or close to the material, so they know of its hazards, how to use protective equipment, and what work practices to follow. The owner must also inspect the material regularly to determine its condition. The owner must also maintain the asbestos containing material in good condition.

Western University employs over 10,000 full time and part time employees, 100 of whom routinely work in locations containing asbestos. Approximately 10 tonnes of ACM waste is generated on the University's premises annually. The handling of this waste is regulated by the *Environmental Protection Act*, Regulation 347. Large fines can be levied to any generator if improperly disposing of ACM waste. The University double-bags all ACM waste in 6-mil polyethylene approved bags which are decontaminated with a HEPA vacuum (High Efficiency Particulate Air Filter) before transporting to a landfill site.

Program Scope

This program applies to all buildings and structures owned by Western University, to all employees and students of the University, to occupants of University buildings and to external organizations who may come into contact with or disturb any asbestos containing material in University buildings.

2.0 DEFINITIONS

Asbestos
Asbestos is a generic term describing a number of naturally occurring fibrous, hydrated mineral silicates that differ in chemical composition and are suitable for use as non-combustible, nonconducting and chemically resistant materials. Different types of asbestos which may be found in buildings are chrysotile, amosite, and crocidolite.

Friable
Friable material means material that when dry can be crumbled, pulverized or powdered by hand pressure, and includes such material that is crumbled, pulverized, or powdered. Three types of friable material commonly used in buildings are:

- sprayed fibrous fireproofing
- decorative or acoustic texture coatings
- thermal pipe insulation (potentially friable)

HEPA
High Efficiency Particulate Air Filter

3.0 HISTORICAL INFORMATION

Identification of the Problem:

Asbestos Regulations were enforced in 1985 which were established to deal with decades of neglect and lack of knowledge towards ACM. Many of the University's buildings were built in the 1950's, at a time when the health hazards related to asbestos exposure were not fully known. Most University maintenance staff had already worked with, or in the vicinity of ACM. In the 1960's there was a sudden realization in North American and Western European countries that an epidemic was occurring, affecting mostly those who were working in the asbestos industry. Administration of many workplaces reacted immediately to comply with the newly established governmental regulations and moved towards documenting inventories of all ACM on their premises.

Part of this University Program includes training to ensure individuals working with ACM have the skills and knowledge to properly follow procedures.

Target Personnel:

All personnel working in ceiling spaces, on ventilation systems and mechanical rooms were identified by the University, together with the department which they operated through. Directors and managers in charge of theses departments were contacted and asked to supply a list of staff who may work in locations identified as containing friable ACM. The staff were mostly skilled trades with varying asbestos-related experience.

4.0 OBJECTIVE OF THE ASBESTOS CONTROL PROGRAM

It is the objective of this asbestos control program to ensure that asbestos-containing materials in University buildings are managed properly. The health of workers and building occupants is safeguarded in accordance with the University Health and Safety Policy and the “Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations” made under the Occupational Health and Safety Act of Ontario.

5.0 ASBESTOS CONTROL PROGRAM

Ontario Reg.278 "Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations", made under the Occupational Health and Safety Act requires that the University maintain a management program with respect to asbestos-containing materials in University buildings. The program documented here is intended to meet the requirements of this regulation.

The basic elements of the control program are:

a. Identification and recording of the locations of all material containing asbestos;
b. Frequent inspections of all asbestos-containing material to determine its condition and repair of damage, and other remedial actions as appropriate;
c. The control of access to areas containing friable asbestos-containing materials;
d. Training and education of workers who may disturb asbestos-containing materials;
e. The provision of appropriate procedures for all asbestos-related work, and the classification of such work as Type 1, 2, or 3 according to Ontario Reg. 278
f. The maintenance of records of Type 2 and Type 3 asbestos-related work;
g. Control and monitoring of external contractors performing work which may disturb asbestos-containing materials;
h. Medical surveillance for workers who perform Type 2 and Type 3 asbestos operations
i. Provision for auditing the implementation and effectiveness of the program; and communication of this program and of asbestos related work taking place in University buildings to the Joint Health and Safety Committees and to other persons who may be affected by the work.

Asbestos-containing materials do not tend to become airborne unless damaged or disturbed. ACM could be disturbed by water damage, maintenance activities, or vandalism which could all increase the risk of generating significant airborne asbestos fibre concentrations. To prevent this potential health hazard, an in-place management program exists at the University. This management program includes periodic

inspections of the asbestos-containing materials and an assessment of the condition of these materials. Repair of damaged asbestos-containing materials must be carried-out by qualified personnel. The program includes the mechanical rooms where large quantities of asbestos are present. In areas where damage and deterioration are found, a plan and remedial action is implemented to repair the damage by taping, enclosing, or by removal. The condition of the asbestos-containing material will dictate the urgency and kind of remedial action necessary.

5.1 Maintenance Activities

Maintenance activities are performed when the affected area is unoccupied. If any ACM has been dislodged during maintenance work, the affected area is cleaned with a vacuum system equipped with HEPA filters. Accumulated dust is cleaned with a HEPA vacuum, or by wet-mopping. Dry sweeping is not allowed as it causes lose fibres to become airborne.

Maintenance workers are provided with and required to wear respirators approved by the National Institute for Occupational Safety and Health (NIOSH). Each maintenance worker is trained on the proper use and care of these respirators. Maintenance workers are instructed on the potential health hazards of asbestos and on safe work practices.

5.2 Asbestos Abatement

If an area where ACM is being repaired it must be completely isolated from the rest of the building. This may involve the construction of a temporary plastic barrier with an "air lock" for worker entry. Ventilation in the area is shut off throughout the abatement. Exhaust fans equipped with a HEPA filter may be used to place the affected area under a slight negative pressure in relation to the rest of the building.

Workers in the area must wear the NIOSH-approved respirators, disposable coveralls and caps. Warning signs are posted around the work area to warn people of the dangers associated with the entry to the work area without wearing protective equipment. Air testing is performed routinely around the abatement area to ensure that asbestos fibres are not released into other areas in the building. Whenever possible, the work area is wetted prior to any disturbance to reduce asbestos fibre release.

6.0 STANDARDS AND GUIDELINES

A number of standards and guidelines have been established for regulating exposure to asbestos. These are found to protect workers who may, during the course of their work, disturb the ACM. At the University, workers performing renovations, maintenance, and janitorial activities receive instructions on the health hazards associated with the

exposure to asbestos fibres. These workers are made aware that exposure, or repeated short exposures to airborne asbestos fibres can produce irreversible lung diseases.

In Ontario, regulations respecting asbestos made under the Occupational Health and Safety Act call for specific strict measures. The Time-Weighted Average (TWA) exposure of an unprotected worker to airborne asbestos shall not exceed 0.1 fibres/cc (fibres per cubic centimetre of air) for any of the forms of airborne asbestos fibres. An employee must take all necessary precautions and follow Western procedures to ensure good work practices. Good hygiene practice dictates that airborne exposures in unprotected occupied areas surrounding a removal project are maintained below detection limits (0.01 fibres/cc).

7.0 STANDARD OPERATING CONDITIONS (REGULATIONS):

7.1 Type 1 Operations

Type 1 Operations, being:

1. Installing or removing ceiling tiles that are asbestos-containing material, if the tiles cover an area less than 7.5 square metres and are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
2. Installing or removing non-friable asbestos-containing material, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
3. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,
    i. the material is wetted to control the spread of dust or fibres, and
    ii. the work is done only by means of non-powered hand-held tools.
4. Removing less than one square metre of drywall in which joint-filling compounds that are asbestos-containing material have been used.

The following measures and procedures apply to Type 1 operations:

1. Before beginning work, visible dust shall be removed with a damp cloth or a vacuum equipped with a HEPA filter from any surface in the work area, including the thing to be worked on, if the dust on that surface is likely to be disturbed.
2. The spread of dust from the work area shall be controlled by measures appropriate to the work to be done including the use of drop sheets of polyethylene or other suitable material that is impervious to asbestos.
3. In the case of an operation mentioned in paragraph 4 of subsection 12 (2), the material shall be wetted before and kept wet during the work to control the spread of dust or fibres, unless wetting would create a hazard or cause damage.
4. A wetting agent shall be added to water that is to be used to control the spread of dust and fibres.

5. Frequently and at regular intervals during the doing of the work and immediately on completion of the work,
    i. dust and waste shall be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a container as described in paragraph 5 of section 15, and
    ii. drop sheets shall be wetted and placed in a container as described in paragraph 5 of section 15, as soon as practicable after subparagraph i has been complied with.
6. Drop sheets shall not be reused.
7. After the work is completed, polyethylene sheeting and similar materials used for barriers and enclosures shall not be reused, but shall be wetted and placed in a container as described in paragraph 5 of section 15 as soon as practicable after paragraph 5 of this section has been complied with.
8. After the work is completed, barriers and portable enclosures that will be reused shall be cleaned, by using a vacuum equipped with a HEPA filter or by damp wiping, as soon as practicable after paragraphs 5 and 7 have been complied with.
9. Barriers and portable enclosures shall not be reused unless they are rigid and can be cleaned thoroughly.
10. Compressed air shall not be used to clean up and remove dust from any surface.
11. Eating, drinking, chewing or smoking shall not be permitted in the work area.
12. If a worker requests that the employer provide a respirator to be used by the worker, the employer shall provide the worker with a NIOSH approved respirator in accordance with Table 2, and the worker shall wear and use the respirator.
13. If a worker requests that the employer provide protective clothing to be used by the worker, the employer shall provide the worker with protective clothing as described in paragraph 12 of section 15, and the worker shall wear the protective clothing.
14. A worker who is provided with protective clothing shall, before leaving the work area,
    i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
    ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.
15. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area.

7.2 Type 2 Operations

Type 2 operations being:

1. Removing all or part of a false ceiling to obtain access to a work area, if asbestos-containing material is likely to be lying on the surface of the false ceiling.
2. The removal or disturbance of one square metre or less of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all

or part of machinery or equipment or a building, aircraft, locomotive, railway car, vehicle or ship.

3. Enclosing friable asbestos-containing material.
4. Applying tape or a sealant or other covering to pipe or boiler insulation that is asbestos-containing material.
5. Installing or removing ceiling tiles that are asbestos-containing material, if the tiles cover an area of 7.5 square metres or more and are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
6. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,
    i. the material is not wetted to control the spread of dust or fibres, and
    ii. the work is done only by means of non-powered hand-held tools.
7. Removing one square metre or more of drywall in which joint filling compounds that are asbestos-containing material have been used.
8. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
9. Removing insulation that is asbestos-containing material from a pipe, duct or similar structure using a glove bag.
10. Cleaning or removing filters used in air handling equipment in a building that has sprayed fireproofing that is asbestos-containing material.
11. An operation that,
    i. is not mentioned in any of paragraphs 1 to 10,
    ii. may expose a worker to asbestos, and
    iii. is not classified as a Type 1 or Type 3 operation.

7.3 Type 3 Operations

Type 3 operations being:

1. The removal or disturbance of more than one square metre of friable asbestos-containing material during the repair, alteration, maintenance or demolition of all or part of a building, aircraft, ship, locomotive, railway car or vehicle or any machinery or equipment.
2. The spray application of a sealant to friable asbestos-containing material.
3. Cleaning or removing air handling equipment, including rigid ducting but not including filters, in a building that has sprayed fireproofing that is asbestos-containing material.
4. Repairing, altering or demolishing all or part of a kiln, metallurgical furnace or similar structure that is made in part of refractory materials that are asbestos-containing materials.
5. Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material, if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters.
6. Repairing, altering or demolishing all or part of any building in which asbestos is or was used in the manufacture of products, unless the asbestos was cleaned up and removed before March 16, 1986.

7.4 Additional Measures

The following measures and procedures apply to Type 2 operations and to Type 3 operations:

1. The work area shall be identified by clearly visible signs warning of an asbestos dust hazard.
2. Signs required by paragraph 1 shall be posted in sufficient numbers to warn of the hazard and shall state in large clearly visible letters that,
    i. there is an asbestos dust hazard, and
    ii. access to the work area is restricted to persons wearing protective clothing and equipment.
3. A wetting agent shall be added to water that is to be used to control the spread of dust and fibres.
4. Eating, drinking, chewing or smoking shall not be permitted in the work area.
5. Containers for dust and waste shall be,
    i. dust tight,
    ii. suitable for the type of waste,
    iii. impervious to asbestos,
    iv. identified as asbestos waste,
    v. cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before being removed from the work area, and
    vi. removed from the workplace frequently and at regular intervals.
6. Frequently and at regular intervals during the doing of the work and immediately on completion of the work,
    i. dust and waste shall be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a container as described in paragraph 5, and
    ii. drop sheets shall be wetted and placed in a container as described in paragraph 5, as soon as practicable after subparagraph i has been complied with.
7. Drop sheets shall not be reused.
8. After the work is completed, polyethylene sheeting and similar materials used for barriers and enclosures shall not be reused, but shall be wetted and placed in a container as described in paragraph 5 as soon as practicable after paragraph 6 has been complied with.
9. After the work is completed, barriers and portable enclosures that will be reused shall be cleaned, by using a vacuum equipped with a HEPA filter or by damp wiping, as soon as practicable after paragraphs 6 and 8 have been complied with.
10. Barriers and portable enclosures shall not be reused unless they are rigid and can be cleaned thoroughly.
11. The employer shall provide every worker who will enter the work area with a NIOSH approved respirator in accordance with Table 2 and the worker shall wear and use the respirator.

12. Protective clothing shall be provided by the employer and worn by every worker who enters the work area, and the protective clothing,
    i. shall be made of a material that does not readily retain nor permit penetration of asbestos fibres,
    ii. shall consist of head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing,
    iii. shall include suitable footwear, and
    iv. shall be repaired or replaced if torn.
13. Compressed air shall not be used to clean up and remove dust from any surface.
14. Only persons wearing protective clothing and equipment shall enter a work area where there is an asbestos dust hazard.

Additional Measures and Procedures, <u>Type 2</u> Operations:

1. If the operation is one mentioned in paragraph 1 of subsection 12 (3), the friable material that is likely to be disturbed shall be cleaned up and removed by using a vacuum equipped with a HEPA filter when access to the work area is obtained.
2. Before commencing work that is likely to disturb friable asbestos-containing material that is crumbled, pulverized or powdered and that is lying on any surface, the friable material shall be cleaned up and removed by damp wiping or by using a vacuum equipped with a HEPA filter.
3. Friable asbestos-containing material that is not crumbled, pulverized or powdered and that may be disturbed or removed during the work shall be thoroughly wetted before the work and kept wet during the work, unless wetting would create a hazard or cause damage.
4. Subject to paragraph 5, the spread of dust from a work area shall be controlled by measures appropriate to the work to be done, including the use of drop sheets of polyethylene or other suitable material that is impervious to asbestos.
5. If the operation is one mentioned in paragraph 1 or 2 of subsection 12 (3) and is carried on indoors, the spread of dust from the work area shall be prevented, if practicable, by,
    i. using an enclosure of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls,
    ii. disabling the mechanical ventilation system serving the work area, and
    iii. sealing the ventilation ducts to and from the work area.
6. Before leaving the work area, a worker shall,
    i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, and
    ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.
7. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area.

Additional Measures and Procedures, glove bag operations:

The following measures and procedures apply to Type 2 operations:

1. The work area shall be separated from the rest of the workplace by walls, barricades, fencing or other suitable means.
2. The spread of asbestos-containing material from the work area shall be prevented by disabling the mechanical ventilation system serving the work area and sealing all openings or voids, including ventilation ducts to and from the working area.
3. Surfaces below the work area shall be covered with drop sheets of polyethylene or other suitable material that is impervious to asbestos.
4. The glove bag shall be made of material that is impervious to asbestos and sufficiently strong to support the weight of material the bag will hold.
5. The glove bag shall be equipped with,
    i. sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period,
    ii. valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure,
    iii. a tool pouch with a drain,
    iv. a seamless bottom and a means of sealing off the lower portion of the bag, and
    v. a high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
6. A glove bag shall not be used to remove insulation from a pipe, duct or similar structure if,
    i. it may not be possible to maintain a proper seal for any reason including, without limitation,
        a. the condition of the insulation, or
        b. the temperature of the pipe, duct or similar structure, or
    ii. the bag could become damaged for any reason including, without limitation,
        a. the type of jacketing, or
        b. the temperature of the pipe, duct or similar structure.
7. Immediately before the glove bag is attached, the insulation jacketing or coating shall be inspected for damage or defects, and if any damage or defect is present, it shall be repaired.
8. The glove bag shall be inspected for damage or defects,
    i. immediately before it is attached to the pipe, duct or other similar structure, and
    ii. at regular intervals during its use.
9. If damage or defects are observed when the glove bag is inspected under subparagraph 8 i, the glove bag shall not be used and shall be disposed of.
10. If damage or defects are observed when the glove bag is inspected under subparagraph 8 ii or at any other time,
    i. the use of the glove bag shall be discontinued,

ii. the inner surface of the glove bag and the contents, if any, shall be thoroughly wetted,
iii. the glove bag and the contents, if any, shall be removed and placed in a container as described in paragraph 5 of section 15, and
iv. the work area shall be cleaned by vacuuming with a vacuum equipped with a HEPA filter before removal work is resumed.

11. When the removal work is completed,
    i. the inner surface of the glove bag and the waste inside shall be thoroughly wetted and the air inside the bag shall be removed through an elasticized valve, by means of a vacuum equipped with a HEPA filter,
    ii. the pipe, duct or similar structure shall be wiped down and sealed with a suitable encapsulant,
    iii. the glove bag, with the waste inside, shall be placed in the proper container
    iv. the work area shall be cleaned by damp wiping or by cleaning with a vacuum equipped with a HEPA filter.

Additional Measures and Procedures for <u>Type 3</u> Operations:

(1) In addition to the measures and procedures prescribed above, the following measures and procedures apply to Type 3 operations:
    1. The work area shall be separated from the rest of the workplace by walls, the placing of barricades or fencing or other suitable means.

(2) In the case of paragraph 5 of a Type 3 operation, the following measures and procedures also apply:
    1. The spread of dust from the work area shall be prevented by,
        i. using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls, and
        ii. using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.
    2. Unless the operation is carried on outdoors, or inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition, the spread of dust from the work area shall also be prevented by,
        i. creating and maintaining within the enclosed area, by installing a ventilation system equipped with a HEPA filtered exhaust unit, a negative air pressure of 0.02 inches of water, relative to the area outside the enclosed area,
        ii. ensuring that replacement air is taken from outside the enclosed area and is free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas, and
        iii. using a device, at regular intervals, to measure the difference in air pressure between the enclosed area and the area outside it.

3. The ventilation system referred to in subparagraph 2 i shall be inspected and maintained by a competent worker before each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it shall be replaced before the ventilation system is used.
4. Before leaving the work area, a worker shall,
    i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, and
    ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15.
5. Facilities for the washing of hands and face shall be made available to workers and shall be used by every worker when leaving the work area.

(3) In the case of paragraph 1, 2, 3 or 4 of a Type 3 operation that is carried on outdoors, the following measures and procedures also apply:

1. If practicable, any asbestos-containing material to be removed shall be thoroughly wetted before and during removal, unless wetting would create a hazard or cause damage.
2. Dust and waste shall not be permitted to fall freely from one work level to another.
3. If practicable, the work area shall be washed down with water after completion of the clean-up and removal described in paragraph 6 of section 15.
4. Temporary electrical power distribution systems for tools and equipment involved in wet removal operations shall be equipped with ground fault circuit interrupters.
5. A decontamination facility shall be located as close as practicable to the work area and shall consist of,
    i. a room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment,
    ii. a shower room as described in paragraph 7 of subsection (4), and
    iii. a room suitable for changing into street clothes and for storing clean clothing and equipment.
6. The rooms described in subparagraphs 5 i, ii and iii shall be arranged in sequence and constructed so that any person entering or leaving the work area must pass through each room.
7. When leaving the work area, a worker shall enter the decontamination facility and shall, in the following order,
    i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
    ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15,
    iii. shower, and
    iv. remove and clean the respirator.

(4) In the case of paragraph 1, 2, 3, 4 or 6 of a Type 3 operation that is carried on indoors, the following measures and procedures also apply:

1. Friable asbestos-containing material that is crumbled, pulverized or powdered and that is lying on any surface in the work area shall be cleaned

up and removed using a vacuum equipped with a HEPA filter or by damp wiping and everything shall be removed from the work area or covered with polyethylene sheeting or other suitable material that is impervious to asbestos.

2. The spread of dust from the work area shall be prevented by an enclosure of polyethylene or other suitable material that is impervious to asbestos, if the work area is not enclosed by walls, and by a decontamination facility consisting of a series of interconnecting rooms including,
   i. a room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment,
   ii. a shower room as described in paragraph 7,
   iii. a room suitable for changing into street clothes and for storing clean clothing and equipment, and
   iv. curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted to each side of the entrance or exit to each room.
3. The rooms described in subparagraphs 2 i, ii and iii shall be arranged in sequence and constructed so that any person entering or leaving the work area must pass through each room.
4. The mechanical ventilation system serving the work area shall be disabled and all openings or voids, including ventilation ducts to or from the work area, shall be sealed by tape or other appropriate means.
5. Unless the operation is carried on inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition, the spread of dust from the work area shall also be prevented by,
   i. creating and maintaining within the enclosed area, by installing a ventilation system equipped with a HEPA filtered exhaust unit, a negative air pressure of 0.02 inches of water, relative to the area outside the enclosed area,
   ii. ensuring that replacement air is taken from outside the enclosed area and is free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas, and
   iii. using a device, at regular intervals, to measure the difference in air pressure between the enclosed area and the area outside it.
6. The ventilation system referred to in subparagraph 5 i shall be inspected and maintained by a competent worker before each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it shall be replaced before the ventilation system is used.
7. The shower room in the decontamination facility shall,
   i. be provided with hot and cold water or water of a constant temperature that is not less than 40° Celsius or more than 50° Celsius,
   ii. have individual controls inside the room to regulate water flow and, if there is hot and cold water, individual controls inside the room to regulate temperature,
   iii. be capable of providing adequate supplies of hot water to maintain a water temperature of at least 40° Celsius, and
   iv. be provided with clean towels.

8. When leaving the work area, a worker shall enter the decontamination facility and shall, in the following order,
    i. decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing,
    ii. if the protective clothing will not be reused, place it in a container as described in paragraph 5 of section 15,
    iii. shower, and
    iv. remove and clean the respirator.
9. If practicable, existing electrical power distribution systems that are not water-tight shall be de-energized and locked out where wet removal operations are to be carried out.
10. Temporary electrical power distribution systems for tools and equipment involved in wet removal operations shall be equipped with ground fault circuit interrupters.
11. Friable asbestos-containing material shall be thoroughly wetted before and during removal, unless wetting would create a hazard or cause damage.
12. The work area shall be inspected by a competent worker for defects in the enclosure, barriers and decontamination facility,
    i. at the beginning of each shift,
    ii. at the end of a shift if there is no shift that begins immediately after the first-named shift, and
    iii. at least once each day on days when there are no shifts.
13. Defects observed during an inspection under paragraph 12 shall be repaired immediately and no other work shall be carried out in the work area until the repair work is completed.
14. If practicable, dust and waste shall be kept wet.
15. On completion of the work,
    i. negative air pressure shall be maintained if required by subparagraph 5 i,
    ii. the inner surface of the enclosure and the work area inside the enclosure shall be cleaned by a thorough washing or by vacuuming with a vacuum equipped with a HEPA filter,
    iii. equipment, tools and other items used in the work shall be cleaned with a damp cloth or by vacuuming with a vacuum equipped with a HEPA filter or they shall be placed in a container as described in paragraph 5 of section 15 before being removed from the enclosure, and
    iv. a visual inspection shall be conducted by a competent worker to ensure that the enclosure and the work area inside the enclosure are free from visible dust, debris or residue that may contain asbestos.
16. Once the work area inside the enclosure is dry after the steps set out in subparagraphs 15 ii, iii and iv have been completed, clearance air testing shall be conducted by a competent worker in accordance with subsection (5), unless the operation is carried on inside a building that is to be demolished and will not be entered by any person except the workers involved in the operation and the workers involved in the demolition.

17. The barriers, enclosure and decontamination facility shall not be removed or dismantled until,
    i. cleaning has been done as described in paragraph 15, and
    ii. if clearance air testing is required, it has been completed and the work area inside the enclosure has passed the clearance air test.

(5) The following rules apply to clearance air testing:
1. Sample collection and analysis shall be done,
    i. using the phase contrast microscopy method, in accordance with subsection (6), or
    ii. using the transmission electron microscopy method, in accordance with subsection (7).
2. If the work area inside the enclosure fails the clearance air test, the steps set out in subparagraphs 15 ii, iii and iv of subsection (4) shall be repeated and the work area shall be allowed to dry before a further test is carried out, unless paragraph 6 of subsection (6) applies.

(6) Clearance air testing using the phase contrast microscopy method shall be carried out in accordance with U.S. National Institute of Occupational Safety and Health Manual of Analytical Methods, Method 7400, Issue 2: Asbestos and other Fibres by PCM (August 15, 1994), using the asbestos fibre counting rules, and shall comply with the following requirements:
1. Testing shall be based on samples taken inside the enclosure.
2. Forced air shall be used, both before and during the sampling process, to ensure that fibres are dislodged from all surfaces inside the enclosure before sampling begins and are kept airborne throughout the sampling process.
3. At least 2,400 litres of air shall be drawn through each sample filter, even though the standard mentioned above provides for a different amount.
4. The number of air samples to be collected shall be in accordance with Table 3.
5. The work area inside the enclosure passes the clearance air test only if every air sample collected has a concentration of fibres that does not exceed 0.01 fibres per cubic centimetres of air.
6. If the work area inside the enclosure fails a first test that is done using the phase contrast microscopy method, the samples may be subjected to a second analysis using transmission electron microscopy in accordance with the standard mentioned in subsection (7).
7. When a second analysis is done as described in paragraph 6, the work area inside the enclosure passes the clearance air test only if every air sample collected has a concentration of asbestos fibres that does not exceed 0.01 fibres per cubic centimetre of air.

(7) Clearance air testing using the transmission electron microscopy method shall be carried out in accordance with U.S. National Institute of Occupational Safety and Health Manual of Analytical Methods, Method 7402, Issue 2: Asbestos by TEM (August 15, 1994), and shall comply with the following requirements:
1. Testing shall be based on samples taken inside the enclosure and samples taken outside the enclosure but inside the building.
2. Forced air shall be used inside the enclosure, both before and during the sampling process, to ensure that fibres are dislodged from all surfaces

before sampling begins and are kept airborne throughout the sampling process.

3. At least 2,400 litres of air shall be drawn through each sample filter, even though the standard mentioned above provides for a different amount.
4. At least five air samples shall be taken inside each enclosure and at least five air samples shall be taken outside the enclosure but inside the building.
5. Sampling inside and outside the enclosure shall be conducted concurrently.
6. The work area inside the enclosure passes the clearance air test if the average concentration of asbestos fibres in the samples collected inside the enclosure is statistically less than the average concentration of asbestos fibres in the samples collected outside the enclosure, or if there is no statistical difference between the two average concentrations.

(8) Within 24 hours after the clearance air testing results are received,

(a) the owner and the employer shall post a copy of the results in a conspicuous place or places,

i. at the workplace, and

ii. if the building contains other workplaces, in a common area of the building; and

(b) a copy shall be provided to the joint health and safety committee or the health and safety representative, if any, for the workplace and for the building.

(9) The owner of the building shall keep a copy of the clearance air testing results for at least one year after receiving them.

Instruction and Training:

(1) The employer shall ensure that instruction and training in the following subjects are provided by a competent person to every worker working in a Type 1, Type 2 or Type 3 operation:

1. The hazards of asbestos exposure.
2. Personal hygiene and work practices.
3. The use, cleaning and disposal of respirators and protective clothing.

(2) The joint health and safety committee or the health and safety representative, if any, for the workplace shall be advised of the time and place where the instruction and training prescribed by subsection (1) are to be carried out.

(3) Without restricting the generality of paragraph 3 of subsection (1), the instruction and training related to respirators shall include instruction and training related to,

(a) the limitations of the equipment;

(b) inspection and maintenance of the equipment;

(c) proper fitting of a respirator; and

(d) respirator cleaning and disinfection.

APPENDIX 1: ASBESTOS CONROL POLICY

WESTERN UNIVERSITY

ASBESTOS CONTROL POLICY

PREPARED BY: **Occupational Health and Safety**
APPROVED BY: **Occupational Health and Safety Committee**
University Health and Safety Committee

EFFECTIVE DATE: August 3, 2006

REVISION: **January 21, 1997**

INTRODUCTION

Many construction and insulation materials contain asbestos. These materials, if removed, or disturbed in an uncontrolled manner, can release asbestos fibres into the air, possibly causing a health hazard. The disturbance and mishandling of the Asbestos-Containing Materials (ACM) can result from activities performed in close proximity to, and not necessarily on asbestos-containing insulation materials. All personnel working with, or in proximity to where there is a likelihood of disturbance to the friable asbestos products must be informed by their supervisors of the known and/or potential hazards associated with this exposure.

All asbestos-related work must be performed in accordance with the Ministry of Labour's (MOL) Asbestos Regulations as a minimum. The work procedures must be safe for the personnel involved, and for the environment, but also must be perceived as safe by the public.

The University has established specific procedures and work practices which meet or exceed this requirement (Work Procedure (WP) 10, 58 and 59 and the Ceiling Space Access Policy). These can be obtained from Facilities Management.

PURPOSE

The Asbestos Control Policy is designed to provide information and guidelines for the safe handling of Asbestos-Containing Materials (ACM) to promote awareness of its presence and location in facilities at Western University. The goal is to ultimately prevent incidents of uncontrolled disturbance.

RESPONSIBILITY

Compliance with this policy is the responsibility of the supervisors of personnel at all levels within administrative, faculty, and ancillary operations, or supervisors of contracted activities where workers may come in contact with ACM.

All uncontrolled asbestos-disturbance incidents must be reported immediately upon discovery to the Occupational Health and Safety (OHS), or Facilities Management. Completion of an incident report is also required from each affected person's supervisor. It is understood that Facilities Management and OHS will share any information regarding such incidents as soon as possible after being notified.

Facilities Management has prepared and is maintaining an inventory of structural asbestos for all affected Western buildings. Also, Facilities Management is responsible for removal and/or clean up of asbestos as required. Facilities Management will also be responsible for notifying OHS of all Type 3 Asbestos operations prior to the commencement of any project.

It is the responsibility of OHS to assess any uncontrolled disturbance of ACM in any University facility and to determine if further monitoring is necessary. OHS is also responsible for compiling annual reports of asbestos exposure to the Ministry of Labour and for providing information to the University community in the form of site visits, consultation, documents, and training sessions.

CONTACTS

If you have any questions or concerns, contact Facilities Management at extension 83304, or Occupational Health and Safety at extension 88730.

REGULATIONS AND GUIDELINES

1. Ministry of Labour, Regulation 278, Designated Substances-Asbestos on Construction Projects and in Buildings and Repair Operations.
2. Ministry of the Environment and Energy, Regulation 347, Section 14, under the Environmental Protection Act.
3. Transportation of Dangerous Goods Act and Regulations, Schedule II, List II.
4. The City of London, Asbestos Waste Packaging Guidelines

DEFINITIONS

Asbestos:

Any fibrous silicates such as chrysotile, amosite, and crocidolite.

Friable Material:

Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized, or powdered.

Type 3 Asbestos Project:

Major removal of friable asbestos-containing materials.

REQUIREMENTS

(a) All handling, renovations, maintenance activities, construction, demolition, and other projects in areas containing ACM, must be performed in accordance with relevant Facilities Management Work Procedures. In situations where these written procedures do not address specific circumstances, appropriate measures must be taken to control the release of asbestos fibres to protect all building occupants. Both Facilities Management and OHS are to be consulted when such matters arise.

(b) University staff and contractors shall not attempt to handle or work in close proximity to ACM without first obtaining the Asbestos Awareness training, in accordance with the Occupational Health and Safety Act, Regulation 278, Section 19. Without proof of training, individuals will not be permitted to work on or in close proximity to ACM. Training may be provided by OHS or other recognized agencies.

(c) Access to all ceiling spaces must be performed in compliance with the requirements outlined in the Ceiling Space Access Policy.

(d) Accompanying this policy are two related documents which further detail the health hazard information that must be distributed to employees. i.e. Asbestos Project Information Handout; and Asbestos Project Information Guideline/Procedure.

(e) All University-generated ACM waste must be double-packaged in approved asbestos bags, and transported to the designated waste-holding facilities on the University's premises at the completion of work. When required, this asbestos waste must be transported to an approved landfill site and must be transported to such site in compliance with Ontario Regulation 347 and the Transportation of Dangerous Goods Act and Regulations.

APPENDIX 2: CEILING SPACE ACCESS POLICY

Western

Western University

CEILING SPACE ACCESS POLICY

PREPARED BY: **OCCUPATIONAL HEALTH & SAFETY, FACILITIES MANAGEMENT**
APPROVED BY: **THE UNIVERSITY HEALTH & SAFETY COMMITTEE**
EFFECTIVE: **August 3, 2006**
REVISION: **January 21, 1997**

PURPOSE
This policy is intended to ensure that entrance to ceiling spaces is performed only by Western University employees, or externally contracted employees who have been trained in the proper procedures for accessing and working in ceiling spaces, and who are aware of the hazards which may be present.

RESPONSIBILITY
It is the responsibility of Deans, Directors or Budget Unit Heads to ensure that persons under their supervision, who are not authorized for ceiling access, do not enter ceiling spaces.

It is the responsibility of the Director of Facilities Management (FM) to ensure that accurate information, with respect to the hazards in ceiling spaces, is made available to Western employees and externally contracted personnel who are authorized to access ceiling spaces. It is the responsibility of the contracting department (ie. FM, CCPS, ITS) to ensure that all externally contracted personnel under their supervision are qualified to access ceiling spaces.

Occupational Health and Safety (OHS) will:
1) provide and/or be consulted in appropriate ceiling space access training,
2) provide and/or be consulted on specialized technical services and advice, including any testing, and
3) audit the program.

CONTACTS

The Facilities Management Service Centre must be contacted at 83304 by all persons planning to enter ceiling spaces on campus for prior authorization and approval *except those having a valid authorization card (refer to Ceiling Space Access Training Guidelines, 96-02) .*

DEFINITIONS

Ceiling Spaces

Ceiling spaces are defined to be any spaces between a suspended ceiling, constructed of any material, and the slab, roof or deck above it.

Hazards

Hazards associated with ceiling spaces include, but are not necessarily limited to, asbestos, electrical shock, falls from ladders and other mechanical and physical hazards. Examples include, sharp surfaces/objects, hot water and steam lines, electrical equipment and wiring, telecommunication cables *and wires*, fire alarm devices, and similar items or materials.

Persons Authorized for Ceiling Space Access

Persons who are authorized for ceiling space access are those who have received *approved **Western** training in the proper procedures *(see Ceiling Space Access Training Guidelines, 96-02) which include* all pertinent health and safety aspects.

REQUIREMENTS

a) *All Western personnel who require access to ceiling spaces must successfully complete required training* in the proper procedures for ceiling space access.

b) *All "authorized persons" who must access ceiling spaces will wear the appropriate visible identification, and will ensure that the proper procedures are carried out.*

c) *All external contracts which require ceiling space access must include a reference to the Ceiling Space Access Policy. All contractor personnel must be trained and subsequently authorized in proper ceiling space access procedures and in safe working procedures by successfully completing the *approved Western training course.*

d) Where ceiling spaces are to be accessed in a building that has asbestos-containing insulation applied to the structure, *or where there is thermal (pipe) insulation that may be damaged*, all work is to be performed in compliance with the requirements outlined in the Asbestos Control Policy.

*approved Western training course: pertinent details are described in the Ceiling Space Access Training Procedure/Guidelines, 96-02.

APPENDIX 3: GENERAL ASBESTOS BUILDING INFORMATION

*The University has updated the asbestos inventory to include the location, type, and condition of all ACM on campus. This information has been made available to all building occupants since November 2007 at the following link:

https://rabbit.vm.its.uwo.ca/AsbestosSurvey/Default.aspx

A summary of the original asbestos inventory may be a useful reference, this is found below:

Western University

Facilities Management ● Support Services Building

Asbestos Reference and Structural Inventory Manual

GENERAL ASBESTOS INFORMATION - SUMMARY

Revised March 2006

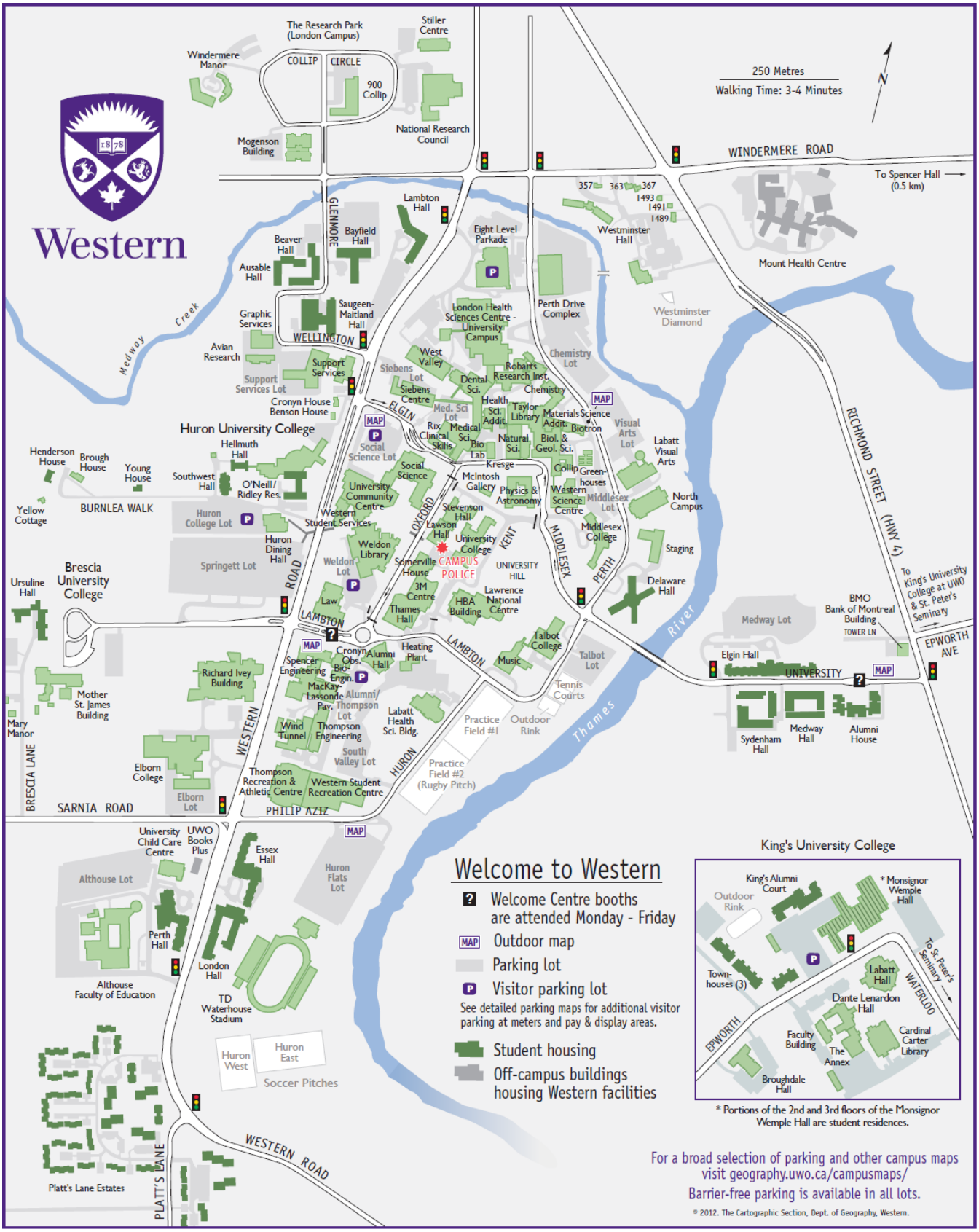
BUILDING	STRUCTURAL	THERMAL	CEILING PLASTER
Althouse College	Y	Y	Y
Althouse Portable			
Alumni Hall	Y	Y	Y
Alumni House	N	N	N
Alumni Western Centre	N	N	N
Ausable Hall Residence	N	Y	N
Bayfield Hall Residence	N	Y	N
Beaver Hall Residence	N	Y	N
Bio-Engineering	N	Y	N
Biology & Geology Greenhouse	N	Y	N
Biology & Geological Sciences	Y	Y	N
Boundary Layer Wind Tunnel	N	N	N
Central Food Commissary	N	Y	N
Chemistry Building	Y	Y	N
Collip Building	N	Y	N
Cronyn Observatory	N	Y	N
Delaware Hall Residence	N	Y	Y
Delaware Radio Observatory	N		
Dental Sciences Building	Y	Y	N

BUILDING	STRUCTURAL	THERMAL	CEILING PLASTER
Dunn Barns			
Elborn College	N	Y	N
Elgin Hall Residence	N	N	N
Elginfield Observatory	N	Y	N
Engineering Sciences Building	Y	Y	N
Essex Hall Residence	N	N	N
Fanshawe Boathouse	N	N	N
Galleria Mall (Continuing Education)	N	N	N
Gibbons Lodge Residence	N	Y	N
Gibbons Lodge Garage			
Hazardous Materials Storage Facility	N	N	N
Health Sciences Addition	N	N	N
Heating Plant	N	Y	N
IMTI	N	N	N
Kresge Building	N	Y	N
Lambton Hall Residence	N	N	N
Law Building	N	Y	N
London Bio Comm Centre	N	N	N
London Museum of Archaeology			
McIntosh Gallery	N	Y	N
Medical Sciences Building	Y	Y	Y
Medway Hall Residence	N	Y	N
Middlesex College	Y	Y	N
Mogenson Building	N	N	N
Molecular Biology Laboratory	N	Y	N
Music Building	N	Y	N
NCMRD	N	N	N
Natural Sciences Centre	Y	Y	Y
NSC - North Chiller Plant	Y	Y	N

BUILDING	STRUCTURAL	THERMAL	CEILING PLASTER
Photo Period Lab			
Physics & Astronomy Building	N	Y	N
Plant Sciences Field Station	N		N
Platt's Lane Apartments	N	N	N
Platt's Lane Townhouses	N	N	N
Saugeen Maitland Hall Residence	N	Y	N
School of Business Administration	Y	Y	Y
Seibens Drake Research Institute	N		
Services Building	Y	Y	N
Social Sciences Centre	Y	Y	N
Somerville House	Y	Y	N
Spencer Hall Complex	N	Y	N
3M Centre	N	N	N
Staging Building	N	Y	N
Stevenson-Lawson Building	Y	Y	N
Sydenham Hall Residence	N	Y	N
Talbot College	Y	Y	N
Taylor Library	N	N	N
TD Waterhouse Stadium	N	N	N
Thames Hall	N	Y	N
Thompson Athletic & Recreational Centre	N	Y	N
University College	Y	Y	N
University Community Centre	N	Y	N
Visual Arts Centre	N	N	N
Welcome Centre - East	N	N	N
Welcome Centre - West	N	N	N

BUILDING	STRUCTURAL	THERMAL	CEILING PLASTER
Weldon Library	N	Y	N
Western Science Centre	N	N	N
Windermere Manor			
Winter Tennis Club	N	N	N
1130 Western Road			
1134 Western Road			
1140 Western Road			
1153 Western Road (Books Plus)	N		
1383 Western Road			
1389 Western Road			
1393 Western Road			

APPENDIX 4: WESTERN CAMPUS MAP


Western
250 Metres
Walking Time: 3-4 Minutes
N
WINDERMERE ROAD
To Spencer Hall (0.5 km)
The Research Park (London Campus)
Stiller Centre
Windermere Manor
COLLIP CIRCLE
900 Collip
National Research Council
Mogenson Building
GLENMORE
Lambton Hall
Bayfield Hall
Beaver Hall
Ausable Hall
Eight Level Parkade
Westminster Hall
357 363 367 1493 1491 1489
Mount Health Centre
Medway Creek
Graphic Services
Saugeen-Maitland Hall
WELLINGTON
Avian Research
Support Services
Support Services Lot
Cronyn House
Benson House
London Health Sciences Centre - University Campus
Perth Drive Complex
Westminster Diamond
Chemistry Lot
West Valley
Siebens Lot
Siebens Centre
Dental Sci.
Robarts Research Inst.
Chemistry
Med. Sci Lot
Health Sci. Addit.
Taylor Library
Materials Science
Addit.
Biotron
Visual Arts Lot
Labatt Visual Arts
Rix Clinical Skills
Medical Sci.
Bio Lab
Natural Sci.
Biol. & Geol. Sci.
Kresge
Collip
Green-houses
ELGIN
Huron University College
Social Science Lot
Social Science
McIntosh Gallery
Physics & Astronomy
Western Science Centre
Middlesex Lot
North Campus
Hellmuth Hall
Henderson House
Brough House
Young House
Southwest Hall
O'Neill/ Ridley Res.
University Community Centre
Stevenson Hall
Lawson Hall
University College
OXFORD
KENT
MIDDLESEX
PERTH
Middlesex College
Staging
Yellow Cottage
BURNLEA WALK
Huron College Lot
Western Student Services
Huron Dining Hall
Weldon Library
Weldon Lot
Somerville House
CAMPUS POLICE
UNIVERSITY HILL
Delaware Hall
Springett Lot
ROAD
Ursuline Hall
Brescia University College
Law
3M Centre
Thames Hall
HBA Building
Lawrence National Centre
LAMBTON
Talbot College
Talbot Lot
Medway Lot
BMO Bank of Montreal
TOWER LN
To King's University College at UWO & St. Peter's Seminary
EPWORTH AVE
Richard Ivey Building
Spencer Engineering
Cronyn Obs.
Alumni Hall
Heating Plant
Bio-Engin.
MacKay-Lassonde Pav.
Alumni/ Thompson Lot
Music
Tennis Courts
Elgin Hall
UNIVERSITY
Mother St. James Building
Mary Manor
WESTERN
Wind Tunnel
Thompson Engineering
Labatt Health Sci. Bldg.
Practice Field #1
Outdoor Rink
Thames River
Sydenham Hall
Medway Hall
Alumni House
BRESCIA LANE
Elborn College
Elborn Lot
South Valley Lot
HURON
Practice Field #2 (Rugby Pitch)
Thompson Recreation & Athletic Centre
Western Student Recreation Centre
SARNIA ROAD
PHILIP AZIZ
University Child Care Centre
UWO Books Plus
Essex Hall
Huron Flats Lot
Althouse Lot
Perth Hall
London Hall
Althouse Faculty of Education
TD Waterhouse Stadium
Huron West
Huron East
Soccer Pitches
WESTERN ROAD
PLATT'S LANE
Platt's Lane Estates
Welcome to Western
Welcome Centre booths are attended Monday - Friday
Outdoor map
Parking lot
Visitor parking lot
See detailed parking maps for additional visitor parking at meters and pay & display areas.
Student housing
Off-campus buildings housing Western facilities
King's University College
King's Alumni Court
Outdoor Rink
* Monsignor Wemple Hall
Town-houses (3)
Labatt Hall
To St. Peter's Seminary
WATERLOO
Dante Lenardon Hall
EPWORTH
Faculty Building
The Annex
Cardinal Carter Library
Broughdale Hall
* Portions of the 2nd and 3rd floors of the Monsignor Wemple Hall are student residences.
For a broad selection of parking and other campus maps visit geography.uwo.ca/campusmaps/
Barrier-free parking is available in all lots.
© 2012. The Cartographic Section, Dept. of Geography, Western.

APPENDIX 5: FACILITIES MANAGEMENT PROCEDURES

- **MINOR ASBESTOS CLEAN-UP IN MECHANICAL ROOMS (WP-10)**
- **ASBESTOS TYPE 1 OPERATIONS (WP-58)**
- **ASBESTOS TYPE 2 OPERATIONS (WP-59)**

POLICY: MINOR ASBESTOS CLEAN-UP CAMPUS MECHANICAL ROOMS			NUMBER: WP-10
			Page 1 of 1
PREPARED BY: Facilities Management	AUTHORIZED BY: D.V.B. Riddell	CLASSIFICATION: Work Procedure	EFFECTIVE: December 1, 2004
			SUPERSEDES: October 1, 1986

APPLICATION:

This work procedure shall be used only in Mechanical Rooms where minimal fall-off has occurred and is lying on the floor or any visible horizontal surfaces.

PREPARATION:

1. Schedule work when personnel are not in the Mechanical Room.

2. Post an asbestos warning sign at entrances to Mechanical Room where this procedure is being used.

WORKER PROTECTION:

All workers in the Mechanical Room to be dressed in disposable coveralls with head cover and approved respiratory protection. Respiratory protection must be used in accordance with the respiratory policy.

WORK PROCEDURE:

Vacuum the floor area and any visible horizontal surfaces where asbestos fall-off is evident.

CLEANUP PRACTICES:

1. Decontaminate shoes and protective clothing by using a HEPA vacuum or by damp wiping.

2. When protective clothing is to be disposed of, it shall be decontaminated as above and double-bagged in 6 mil polyethylene bags with one yellow and one clear bag sealed separately and taken to Services Building for ultimate disposal.

3. Workers shall thoroughly wash hands and face at the nearest washroom when work is complete.

GENERAL PRECAUTIONS:

1. Vacuum cleaners referred to in this work procedure are special asbestos vacuums equipped with HEPA filters.

2. No eating, drinking or smoking is allowed in the work area.

3. Compressed air shall not be used to clean up or remove asbestos from any surface.

WORK PROCEDURES:

1. Remove or push the tile aside carefully, minimizing the quantity of dust and other material from the top surface of the tile being released into the room or corridor.

2. Vacuum tile supports in the area of the removed/relocated tile.

3. Vacuum the dust from cable impeding access to the ceiling space before moving it aside.

4. After completion of the inspection/adjustment carefully replace the removed/relocated tile to its original position.

CLEANUP PRACTICES:

1. Vacuum all ladder surfaces, beginning at the top of the ladder and preceding downwards.

2. If, by accident, a piece of asbestos is dislodged and falls to the floor, it must be cleaned up with a vacuum if possible. If it is too large for this, it shall be thoroughly wetted using amended water and a spray bottle, and carefully placed in a 6 mil. of polyethylene bag.

3. Vacuum the floor area at least 12 feet square centred under the tile removed.

4. Decontaminate shoes and protective clothing by using a vacuum or by damp wiping.

5. When protective clothing or drop sheets are to be disposed of, they shall be decontaminated as above and placed in 6 mil. polyethylene bags.

6. All material for disposal to be double bagged in 6 mil. polyethylene bags, with one yellow and one clear bag sealed separately, and taken to the Services Building for ultimate disposal.

7. Workers shall thoroughly wash hands and face at the nearest washroom when work is complete.

GENERAL PRECAUTIONS:

1. A wetting agent shall be added to water required to be used by this work procedure to improve its capability to control the spread of asbestos dust.

2. Vacuum cleaners referred to in this work procedure are special asbestos vacuums equipped with High Efficiency Particulate Air filters.

3. No eating, drinking, or smoking is allowed in the work area.

4. Compressed air shall not be used to clean up or remove asbestos from any surface.

POLICY: MINOR ASBESTOS CLEAN-UP CAMPUS MECHANICAL ROOMS			NUMBER: WP-10 Page 1 of 1
PREPARED BY: Facilities Management	**AUTHORIZED BY:** D.V.B. Riddell	**CLASSIFICATION:** Work Procedure	**EFFECTIVE:** December 1, 2004 **SUPERSEDES:** October 1, 1986

APPLICATION:

This work procedure shall be used only in Mechanical Rooms where minimal fall-off has occurred and is lying on the floor or any visible horizontal surfaces.

PREPARATION:

3. Schedule work when personnel are not in the Mechanical Room.

4. Post an asbestos warning sign at entrances to Mechanical Room where this procedure is being used.

WORKER PROTECTION:

All workers in the Mechanical Room to be dressed in disposable coveralls with head cover and approved respiratory protection. Respiratory protection must be used in accordance with the respiratory policy.

WORK PROCEDURE:

Vacuum the floor area and any visible horizontal surfaces where asbestos fall-off is evident.

CLEANUP PRACTICES:

4. Decontaminate shoes and protective clothing by using a HEPA vacuum or by damp wiping.

5. When protective clothing is to be disposed of, it shall be decontaminated as above and double-bagged in 6 mil polyethylene bags with one yellow and one clear bag sealed separately and taken to Services Building for ultimate disposal.

6. Workers shall thoroughly wash hands and face at the nearest washroom when work is complete.

GENERAL PRECAUTIONS:

4. Vacuum cleaners referred to in this work procedure are special asbestos vacuums equipped with HEPA filters.

5. No eating, drinking or smoking is allowed in the work area.

6. Compressed air shall not be used to clean up or remove asbestos from any surface.

WORK PROCEDURES:

5. Remove or push the tile aside carefully, minimizing the quantity of dust and other material from the top surface of the tile being released into the room or corridor.

6. Vacuum tile supports in the area of the removed/relocated tile.

7. Vacuum the dust from cable impeding access to the ceiling space before moving it aside.

8. After completion of the inspection/adjustment carefully replace the removed/relocated tile to its original position.

CLEANUP PRACTICES:

8. Vacuum all ladder surfaces, beginning at the top of the ladder and preceding downwards.

9. If, by accident, a piece of asbestos is dislodged and falls to the floor, it must be cleaned up with a vacuum if possible. If it is too large for this, it shall be thoroughly wetted using amended water and a spray bottle, and carefully placed in a 6 mil. of polyethylene bag.

10. Vacuum the floor area at least 12 feet square centred under the tile removed.

11. Decontaminate shoes and protective clothing by using a vacuum or by damp wiping.

12. When protective clothing or drop sheets are to be disposed of, they shall be decontaminated as above and placed in 6 mil. polyethylene bags.

13. All material for disposal to be double bagged in 6 mil. polyethylene bags, with one yellow and one clear bag sealed separately, and taken to the Services Building for ultimate disposal.

14. Workers shall thoroughly wash hands and face at the nearest washroom when work is complete.

GENERAL PRECAUTIONS:

5. A wetting agent shall be added to water required to be used by this work procedure to improve its capability to control the spread of asbestos dust.

6. Vacuum cleaners referred to in this work procedure are special asbestos vacuums equipped with High Efficiency Particulate Air filters.

7. No eating, drinking, or smoking is allowed in the work area.

8. Compressed air shall not be used to clean up or remove asbestos from any surface.

The UNIVERSITY of WESTERN ONTARIO

Physical Plant and Capital Planning Services Division

POLICY: ASBESTOS - TYPE 1 OPERATIONS			NUMBER: WP-58 Page 1 of 2
PREPARED BY: PP&CPSD	AUTHORIZED BY: D.V.B. Riddell	CLASSIFICATION: Work Procedure	EFFECTIVE: June 15, 2006 SUPERSEDES: New

APPLICATION:

This work procedure shall be used in the following circumstances:

a. **Installing / removing ceiling tiles** that are Asbestos-Containing Materials (ACM) covering an area **less than 7.5 m²** and are installed or removed without being broken , cut drilled abraded, ground. sanded or vibrated.

b. Installing or removing **non-friable ACM, other than ceiling tiles**, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.

c. Breaking, cutting, drilling, abrading, grinding, sanding, or vibrating **non-friable ACM if the material is wetted and the work is done only by hand tools**.

d. **Removal of less than 1m² of dry wall** in which joint-filling compounds that are asbestos-containing material have been used

PREPARATION OF WORK AREA:

Although this work procedure addresses the handling of wetted non-friable ACM, the work area must be clearly identified and isolated from the rest of the workplace by means of caution tape or barricade.

WORKER PROTECTION:

Respirator and protective clothing may be requested; in this case, the worker will be fit-tested and provided with an adequate respirator and protective clothing. The worker must wear the respirator and protective clothing for the duration of the work project.

WORK PROCEDURE:

1. Prior to handling, all tiles and other non-friable ACM shall be decontaminated with a HEPA vacuum or damp wiping.
2. Position a 6-mil polyethylene drop sheet directly underneath the work area so that fragments of ACM and other waste would be captured and collected.
3. Material shall be thoroughly wetted with amended water before handling, and at reasonable intervals, to reduce the generation of dust.
4. Upon completion, fold up drop sheet and place waste in 6-mil polyethylene.

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GENERAL PRECAUTIONS:

1. A wetting agent shall be added to water required to be used by this work procedure to improve its capability to control the spread of asbestos dust.
2. Vacuum cleaners referred to in this work procedure are special asbestos vacuums equipped with High Efficiency Particulate Air filters.
3. No eating, drinking, or smoking is allowed in the work area.
4. Compressed air shall not be used to clean up or remove dust from any surface.
5. Clean-up at regular intervals
6. Drop sheets and any other sheeting shall not be reused
7. All material for disposal to be double bagged in 6 mil. polyethylene bags, with one yellow and one clear bag sealed separately, and taken to the Services Building for ultimate disposal.
8. Workers shall thoroughly wash hands and face at the nearest washroom when work is complete

POLICY: O Regulation 278/05 Type 2 Operations	NUMBER: WP-59
	Page 2 of 3

PREPARATION OF WORK AREA:

1. Shut down, and isolate, all ventilation serving the work area. Seal all ventilation openings with plastic sheeting.
2. Remove all furnishings and equipment from the work area where practical. This should include anything that the occupants may wish to use during the work period. Where this is not practical, cover with 6 mil. polyethylene and seal.
3. Erect a portable enclosure to seal the work area using 6 mil. polyethylene sheeting. Entrance to the enclosure shall be through a double overlapping flap of 6 mil. polyethylene. Both carpeted and hard surface floors require a single layer of 6 mil. polyethylene sealed to the enclosure.
4. Post applicable warning signs, available from the Tool Crib, at the entrance(s) to the work area, and directly on the flap door of the portable enclosures.

WORKER PROTECTION:

1. All individuals entering the enclosure must wear approved respirators and disposable coveralls with head cover.
2. Disposable coveralls and work boots shall be HEPA vacuumed, or wet wiped, before leaving the enclosure.
3. After leaving the enclosure, individuals shall thoroughly wash their hands and face, at the nearest washroom.

WORK PROCEDURE:

1. All tiles removed from the ceiling shall be HEPA vacuumed and covered with plastic.
2. Any friable asbestos lying in the area of the work, and which may be disturbed during the work, shall be cleaned up by HEPA vacuuming or wet wiping before commencing any work.
3. If any asbestos is to be removed, it shall be thoroughly wetted with amended water before removal.
4. Exposed edges of asbestos, resulting from removal, shall be sealed with an approved spray adhesive made for this specific purpose.
5. Frequently, and at regular intervals during the work, dust and waste containing asbestos in the work area shall be cleaned up by wet wiping and placed in 6 mil. polyethylene bags, or shall be cleaned up by HEPA vacuuming (after large pieces of asbestos and/or materials containing asbestos are picked up).

CLEANUP:

1. At regular intervals during the work, and upon completion, asbestos-containing dust and bagged waste shall be cleaned up using a HEPA filtered vacuum, or by wet wiping.
2. All tools and equipment used inside the enclosure shall be HEPA vacuumed before removal.
3. The complete floor area shall be HEPA vacuumed before the removal of the enclosure.
4. All material for disposal shall be placed in approved, labelled bags, which shall be HEPA vacuumed or wet wiped before removal from the work area. Waste shall be doubled bagged, with one yellow and one clear bag. Each bag shall be sealed separately.
5. Plastic sheeting shall be wetted before removal and disposal. Rigid and portable enclosures to be reused shall be thoroughly cleaned by HEPA vacuuming or wet-wiping.

APPENDIX 6: ASBESTOS HEALTH HAZARDS

CLEANUP- continued:

6. When protective clothing is to be disposed of, it shall be decontaminated, as above, and double bagged in 6 mil. polyethylene bags (yellow and clear bags) that are sealed separately.

7. All material for disposal is to be sealed in 6 mil. bags, labelled to indicate contents, and taken to the Services Building for holding until ultimate disposal.

GENERAL PRECAUTIONS:

1. A wetting agent shall be added to the water required to be used by this work procedure to improve its capability to control the spread of asbestos dust.

2. No eating, drinking, chewing, or smoking is allowed in the work area.

3. Compressed air shall not be used to clean up, or remove asbestos, from any surface.

DEFINITIONS:

False Ceiling	-	Any suspended ceiling, all of, or part of, which is removable. (Includes access openings to non-removable ceilings.)
Friable Asbestos	-	Asbestos containing material that can be crumbled, pulverized, or powdered, including that which has been crumbled, pulverized, or powdered.
Ventilation	-	All air-handling systems moving air into, or out of, or within the work area.
Isolation	-	Sealing off of a duct to prevent airflow into, or out of, the work area.
Amended Water	-	Water to which a wetting agent has been added to improve its capability to control the spread of dust.
HEPA Vacuum	-	A vacuum cleaner equipped with a High Efficiency Particulate Air filter to trap very small asbestos particles.

Asbestos Health Hazards

Asbestos is a generic term referring to various fibrous mineral silicates, including chrysotile (hydrated magnesium silicate), amosite (iron-magnesium silicate), crocidolite (sodium-iron silicate), tremolite (calcium-magnesium silicate), anthophyllite (another iron-magnesium silicate), and actinolite (calcium-magnesium-iron silicate).

The potential health hazards associated with exposure to asbestos result from inhalation of airborne fibres; small asbestos fibres can pass readily through the upper respiratory tract and be deposited in the terminal bronchioles of the lung. There the fibres can produce a local irritation which the body attempts to overcome by initiating a tissue response resulting in the encapsulation of the fibres and consequent formation of "asbestos bodies." Asbestos fibres are the causative agents in cases of asbestosis, a progressive disease characterized by diffuse interstitial fibrosis and, at times, pleural changes of fibrosis and calcification. The disease is often evident by such clinical signs as rales and dyspnea. In its severe form, asbestosis can contribute to, and result in, death due to the inability of the body to obtain oxygen or the heart to pump blood through the scarred lungs.

Exposure to airborne asbestos fibres has also been associated with bronchogenic carcinoma (a malignancy of the interior of the lung), mesothelioma (a diffuse malignancy of the lining of the chest cavity or abdomen), and cancer of the stomach, colon and rectum. Cigarette smoking can enhance the incidence of bronchogenic carcinoma from this substance.

APPENDIX 7: METHOD OF ANALYSIS FOR ASBESTOS BULK

METHOD OF ANALYSIS FOR ASBESTOS BULK USING POLARIZED LIGHT MICROSCOPY (PLM)

When a bulk asbestos sample is received, several representative portions of the sample are removed and put into a labelled Petri dish. The sample parts are examined through a sterobinocular microscope and fibres are extracted using forceps. These extracted fibres are then placed on a microscope slide and mounted using a refractive index solution (high dispersion (HD) Cargille Liquid).

After mounting, the fibres are identified using polarized light microscopy (PLM), supplemented by dispersion staining. After fibre identification by PLM, an estimation (+ or - 10%) is made as to the percent (area) composition of asbestos. The estimated percentages are based on size, number, shape, and density of each of the components, and comparison to a standard set of samples previously quantitated.

McCrone, Walter C., The Asbestos Particle Atlas, Ann Arbor Science Publishers, Inc., 1980

APPENDIX 8: ASBESTOS TRAINING PROGRAM

ASBESTOS TRAINING PROGRAM

PACKAGE NO. 1 INITIAL TRAINING SEMINAR

This introductory training seminar will be offered to every worker employed by the University who is likely to work in close proximity to and may disturb Asbestos Containing Material (ACM), and to all new trades personnel. The Ministry of Labour (MOL) has set a precise training requirement for workers and includes information on:

(a) The hazards of asbestos exposure
(b) The use, care and disposal of personal protective equipment (PPE)
(c) Proper work practices and procedures
(d) The types of asbestos operations to be performed by these workers
(e) The work practices, procedures and PPE needed for each type as specified by the regulation
(f) Standard operating procedures for each operation involving potential exposure to friable asbestos.

In addition, the following two items will also be presented:

1. The proper handling/use of HEPA vacuums
2. The action to take upon the discovery of suspicious material

This training session is expected to take three hours.

PACKAGE NO. 2 THE GENERAL REFRESHER PACKAGE

This seminar will be offered on an annual basis to Caretakers, Service Workers, and other staff who are not expected to work in areas containing ACM, but might discover fallen insulation material, or detect signs of damage and disturbance to the ACM. The seminar will cover the following:

(a) Any changes in legislation or recommended work practices
(b) A review of the action to take upon the discovery of suspicious material
(c) A review of where to go for information
(d) The requirements for project notification
(e) The proper handling of HEPA vacuums.

This training seminar is expected to take one hour.

APPENDIX 9: ASBESTOS PROJECT INFORMATION

Western **SAFETY PROCEDURE/GUIDELINES**	**NUMBER:** 96 - 01 **PAGE:** 1 OF 1
SUBJECT: ASBESTOS PROJECT INFORMATION	**EFFECTIVE DATE:** December 12, 2006 **SUPERSEDES:** January 21, 1997
APPLIES TO: ALL DEPARTMENTS	**APPROVED: OHSC (Committee)** **UHSC (Committee)**

This corporate guideline/procedure is intended as a minimum requirement upon which individual departments can build their own program directed at the specifics of their activities.

Western University will provide information to all affected occupants on the known health hazards of asbestos in the workplace environment.

*Personnel working in proximity to Type 3 asbestos *projects where **friable Asbestos-Containing Materials are known to exist will be informed as follows:*

1. The work coordinator will provide an Asbestos Project Information Handout to the supervisor(s) of personnel in the affected area at least two weeks prior to the commencement of any project.

2. The work coordinator will also provide a 10-minute VHS video entitled “Asbestos in School Buildings” to the same supervisor(s) for use during the entire duration of the project.

3. supervisor(s) of the affected areas will be responsible for:

    a. Distributing the “Asbestos Project Information Handout” to personnel in affected areas.

    b. Having the video “Asbestos in School Buildings” available for review by concerned staff.

c. If required, a request for an Asbestos Information Seminar can be made by the supervisor(s) in the affected area(s). This is available from the Occupational Health and Safety, extension 88730.

Questions or concerns should be directed to Facilities Management at extension 83304, or Occupational Health and Safety at extension 88730.

Type 3 Asbestos: Major friable asbestos disturbance.
**Projects: Construction, renovations, or maintenance activities where friable asbestos-containing materials are present.*
*** Friable Material: Material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized, or powdered.*

WESTERN UNIVERSITY

ASBESTOS PROJECT INFORMATION HANDOUT

Western University ensures that all asbestos removal procedures, ceiling space entry, and maintenance activities in areas containing Asbestos-Containing Materials (ACM) are performed in such a way as to prevent the spread of asbestos dust/debris and in accordance with governmental procedures and regulations.

Advanced notice will be provided by the project coordinator / supervisor to affected occupants. The notice shall include information on the anticipated duration of the project, type of work, and name of the group performing the work. All personnel working with or in proximity to friable asbestos projects will be informed of the known and / or potential hazards associated with the exposure to asbestos.

A VHS video addressing the issues of asbestos in school buildings is available for review through your supervisor.

Maintenance or contracted personnel doing work on or near ACM, will adopt those controls that are appropriate to the type of work being done and as listed below:

1. Post the area with asbestos hazard signs.
2. Where classification of work requires it, disable the ventilation system serving the work area, and seal the ventilation ducts to and from the work area.
3. Install polyethylene enclosure (or utilize a portable enclosure) around the affected area to prevent the spread of ACM.
4. Wear personal protective equipment as prescribed to protect against the exposure to asbestos.
5. Maintain proper controls in the work area to prevent the release of ACM outside of the work area.
6. During, and immediately upon completion of the work, vacuum all exposed surfaces with asbestos vacuums and double-bag the waste with 6-mil polyethylene bags.

During major asbestos disturbance projects (Type 3), a qualified Safety Officer or inspecting agency will monitor the air in and around the affected area. Monitoring of the air will be performed before, during, and immediately after the completion of the project. All samples will be analyzed by an accredited laboratory.

Since the enclosure of the work area is designed to prevent the spread of asbestos fibres, personnel working outside the enclosed area may continue to work in a normal manner. However, they should note that:

(a) access to the enclosed area is restricted to trained persons only wearing protective clothing and equipment.
(b) evidence of dust/debris created by the work and /or lack of enclosure should be reported to the supervisor in charge or by calling the numbers below.

If you have any questions or concerns contact Facilities Management at extension 83304 or Occupational Health and Safety at extension 88730.