

Asbestos Management Program

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Applies To: University of Michigan employees trained to remove asbestos.

This Guideline is issued by the Department of Environment, Health & Safety to provide guidance and consistency in management of asbestos containing materials at the University of Michigan.

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Summary

Asbestos is a naturally occurring group of fibrous minerals. It was added to many building materials because it is heat and chemical resistant, strong, and not easily degraded. Asbestos was widely used in building materials prior to 1980. Approximately 75% of the University's buildings were constructed before this time. *Asbestos containing materials* can also be found in building materials used after 1980, although it is rare. Asbestos is primarily found in insulation around pipes, ducts, and tanks. Other asbestos containing materials include sprayed-on fireproofing, troweled-on plaster, fire doors, wallboard, fume hood linings, linoleum, laboratory countertops, and floor tiles.

Asbestos becomes a concern when fibers become airborne. Materials that can be crumbled or reduced to powder by hand pressure are considered to be "friable", meaning they have the potential to become airborne. *Intact*, sealed, and undisturbed materials do not present an exposure risk. When materials are exposed or disturbed, asbestos fibers can become airborne, and exposure may result from fibers being inhaled. Studies have shown that some individuals exposed to asbestos fibers have developed lung cancer, *asbestosis* (scarring of the lungs), and *mesothelioma* (cancer of the lining of the lung or abdomen). These diseases have generally been observed after long-term exposures from activities that directly disturb asbestos containing materials (ACM). Typically, the diseases do not develop until 10 to 40 years after exposure.

EHS, in conjunction with UM–Facilities & Operations and UM–Architecture, Engineering & Construction (AEC), has maintained an Asbestos Management Program on campus for several years. The UM-Housing Division has also maintained a comprehensive Asbestos Management Program that covers all student housing facilities. The management programs follow the Environmental Protection Agency's (EPA) philosophy, which is detailed in a document titled "[Managing Asbestos in Place](#)". The agency recommends a pro-active in-place management program rather than requiring removal of all asbestos materials. This strategy involves identifying ACM, maintaining those materials in good condition and removing ACM as needed during maintenance or renovation activities.

Scope

This Guideline has been developed to inform the University community of the Asbestos Management Program for University buildings. The purpose of a management program is to reduce or eliminate the risk of employee exposure to asbestos containing materials. The requirements and procedures associated with asbestos removal activities are also outlined for those individuals that have been trained to perform those activities.

Reference Regulations

- [Asbestos for General Industry](#): MIOSHA Part 305 and OSHA 29 CFR REGULATIONS 1910.1001
- [Asbestos Standards for Construction](#): MIOSHA Part 602 and OSHA 29 CFR 1926.1101
- [National Emissions Standards for Hazardous Air Pollutants](#) (NESHAPS): 40 CFR 61, Subpart M (National Emission Standard for Asbestos)
- [Asbestos Model Accreditation Plan](#) (MAP): 40 CFR 763 (Appendix C)
- [Asbestos Workers Accreditation Act](#): Michigan Act 440, P.A. of 1988
- [Asbestos Abatement Contractors Licensing Act](#): Michigan Act 135, P.A. of 1986

Glossary of Terms

TERM	DEFINITION
Asbestos	Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these materials that have been chemically treated and/or altered.
Asbestos Containing Material (ACM)	Is a material that has been tested and determined to contain more than 1% asbestos, or is assumed to be in the absence of testing. Also refer to the definition of <i>Presumed Asbestos Containing Material (PACM)</i> . Exposure to asbestos occurs when airborne fibers are inhaled into the lungs. The Michigan Occupational Safety and Health Administration (MIOSHA) set the permissible exposure limit (PEL) at 0.1 fibers per cubic centimeter as a time-weighted average (TWA) over an 8 hour workday. There should be no exposure in excess of the Short Term Excursion Limit (STEL), which is 1.0 fiber per cubic centimeter of air as a 30-minute TWA.
Asbestosis	Scarring of lung tissue (around terminal bronchioles and alveolar ducts) resulting from the inhalation of asbestos fibers.
Authorized Person	Is any person authorized by the employer and required by work duties to be present in regulated areas.
Class I Asbestos Work	Are activities involving the removal of thermal systems insulation (TSI) and surfacing ACM and PACM.
Class II Asbestos Work	Is activity involving the removal of ACM that is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding, and construction mastics.
Class III Asbestos Work	Is repair and maintenance operations, where ACM, including thermal systems insulation and surfacing ACM and PACM, is likely to be disturbed.
Class IV Asbestos Work	Is maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.
Disturbance	Is activity that disrupts the matrix of ACM, crumbles or pulverizes ACM, or generates visible debris from ACM. Disturbance includes cutting away small amounts of ACM, no greater than the amount which can be contained in one standard sized <i>glovebag</i> or waste bag in order to access a building component. In no event shall the amount of ACM disturbed exceed that which can be contained in one glovebag or waste bag which shall not exceed 60 inches in length and width.
Enclosure	Means an airtight, impermeable, barrier around an ACM designed to prevent the release of asbestos fibers into the air.
Fiber	Means a particulate form of asbestos 5 micrometers (µm) or longer, with a length-to-diameter ratio of at least 3 to 1.

TERM	DEFINITION
Friable	Means asbestos-containing material that when dry, can be easily crumbled or pulverized to powder by hand pressure and is therefore likely to emit fibers.
Glovebag	Is not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.
High-Efficiency Particulate Air (HEPA) Filter	Is a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 µm in diameter.
Intact	Means that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.
Mesothelioma	Is a rare form of cancer of the lining of the lung or abdomen.
Negative Exposure Assessment	Means a demonstration by the employer, that employee exposure during an operation is expected to be consistently below the Permissible Exposure Limit (PEL) and Excursion Limit (EL). It is job specific and the work place conditions, type of material, control methods, work practices, and environmental conditions must closely resemble those of the activity to be represented.
Presumed Asbestos Containing Material (PACM)	Is thermal system insulation and surfacing material found in buildings constructed no later than 1980. All materials meeting this definition must be presumed to be asbestos containing and handled as such unless analytical testing proves otherwise.
Regulated Area	Is an area established by the employer to demarcate areas where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limits.
Surfacing Material	Is material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).
Thermal System Insulation (TSI)	Is ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.

Responsibility

Supervisors

- Assure employees who are required to be trained receive training in accordance with this Guideline.
- Assure employees practice safe work procedures in accordance with their training, and use the proper equipment and controls.
- Assure that employees are not disturbing any materials that are suspected to contain asbestos. Contact EHS for testing at 7-1142 or the UM- Facilities & Operations Plumbing Shop at 3-4327 for clean-up/repair if ACM is accidentally disturbed.
- Submit Work~Connections [injury/illness forms](#) for any work-related accident, injury, or exposures.
- Contact EHS to request technical assistance.

Employees

- Report any suspect materials to supervisor prior to disturbance.
- Report accidental disturbances to your supervisor.
- Perform asbestos removal activities as trained for in a safe manner following all regulations and this Guideline while wearing appropriate personal protective equipment as necessary for the type of job performed.

UM – Architecture, Engineering & Construction (AEC)

- Request asbestos surveys during the design phase of any project that may involve the disturbance of suspect asbestos containing materials.
- Prequalify asbestos abatement contractors. Contractors who would like to apply to become a University qualified asbestos abatement contractor can submit a [Contractor Application for Qualification packet](#) from AEC.
- Conduct oversight of projects involving asbestos related activities. This includes ensuring that demolition activities do not disturb asbestos materials.
- Ensure that EHS is notified prior to the start of all abatement activities.
- Contact EHS to report any accidental disturbances of asbestos or to have any suspect materials tested.

EHS

- Review and revise the Asbestos Management Program Guideline as necessary.
- Coordinate and contract industrial hygiene services to survey and label ACM in buildings and monitor asbestos abatement activities.
- Maintain asbestos surveys of University buildings on the EHS website. To access asbestos survey information, follow the below link:
<http://ehs.umich.edu/living-safely/building-environment-issues/asbestos/asbestos-building-surveys-campus/>
- Assist the UM-Architecture, Engineering & Construction Department in the prequalification of asbestos abatement contractors.
- Provide training or coordinate the scheduling of external training as necessary.
- Provide technical assistance upon request.
- Serve as a University liaison for local, county, and state agencies regarding asbestos issues and inspections.
- Review and revise University asbestos contract specifications in conjunction with UM – Architecture, Engineering & Construction Management, as necessary.
- Maintain all records of ACM and employee exposures.
- Schedule and maintain records of all medical surveillance services, training, air monitoring, and building surveys.

Asbestos Abatement Compliance

Asbestos Surveys

An asbestos survey is conducted prior to any renovation of any building, regardless of the date of construction. Representative samples are taken of every suspect material, which are analyzed at an independent laboratory. All surveys are conducted according to the requirements set forth in the MIOSHA [Asbestos Standards for Construction](#). Any *thermal systems insulation (TSI)* material or *surfacing material* not tested **must** be presumed to be asbestos containing and handled accordingly. A scope of asbestos work will be developed for each project that outlines the materials present as well as the abatement techniques to be utilized.

[Asbestos survey information](#) is available on the EHS website.

Asbestos Abatement Contractors

The majority of renovation projects involving asbestos containing materials are managed by UM-Architecture, Engineering & Construction. An asbestos abatement contractor is usually retained for abatement either by direct contract or as a subcontractor to a general contractor.

All asbestos abatement contractors **must** be prequalified to bid on University projects. Prequalification of asbestos contractors is conducted through the Architecture, Engineering & Construction Department.

All contractors are required to follow “[Section 028213 – Asbestos Remediation](#)” of the University Master Specification which would be included in the bid documents. The specification will be modified for each project according to the scope of the abatement work to be completed.

In-House Trained Personnel

Renovation and maintenance projects may also be conducted by in-house trained personnel. Several groups within UM- Facilities & Operations can conduct abatement activities for these projects. There are also other University Departments that have been trained to conduct routine maintenance activities within their respective areas as well.

All workers are trained and accredited as required by the [Asbestos Standards for Construction](#) and the State of Michigan [Asbestos Worker Accreditation Act](#).

The following groups at the University have individuals trained as asbestos workers:

- UM-Facilities & Operations Plumbing Shop – insulators trained as 40-hour asbestos competent persons capable of performing all classes of work.
- UM-Facilities & Operations Roofing Department – trained as 40-hour asbestos competent persons, although work is restricted to roofing repair work.
- UM-Facilities & Operations Construction Services – trained for Intact Floor Tile and Counter Top Removal (Class II).
- UM-Housing – trained for Intact Floor Tile Removal (Class II) and Operations and Maintenance (Class III).
- UM-Athletics – trained in Operations and Maintenance (Class III).
- UM- Facilities & Operations Sheet Metal & Construction Services – trained in Class II Duct Caulk Removal.

Air Monitoring

The EHS Department hires independent consultants to conduct asbestos air monitoring during ACM removal projects conducted by asbestos abatement contractors as well as in-house personnel. The consultants typically conduct personal, area, and final clearance monitoring to ensure that fiber levels are below established standards.

The method of sampling is [NIOSH Method 7400](#) (Asbestos and Other Fibers by PCM – Phase Contrast Microscopy). The method involves collection of a volume of air on 25 mm Mixed Cellulose Ester (MCE) filters and on-site analysis using an optical microscope. All consultants are required to complete the NIOSH 582 course for asbestos fiber counting.

The MIOSHA permissible exposure limit (PEL) for employee exposures to airborne asbestos is 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). The Excursion Limit (EL) is 1.0 f/cc as a 30-minute sample that should not be exceeded.

The State of Michigan clearance level of 0.05 f/cc is required for any project involving more than 10 linear or 15 square feet or more of friable material that is performed within a negative pressure enclosure. The University strives to ensure that the clearance levels are below the EPA recommended level of 0.01 f/cc.

University employees' personal exposures are maintained in a database at the EHS department. The exposures are categorized by type of removal to serve as a negative exposure assessment as required by the MIOSHA standard. A negative exposure assessment is job specific and the work place conditions, type of material, control methods, work practices, and environmental conditions **must** closely resemble those of the activity to be represented. The assessment can be used to show that levels for a given job will be below the PEL and EL, so that lower levels of respiratory protection can be used.

Notification Procedures

1. **Occupant Notification** – Every effort should be made to pre-notify individuals who work in or adjacent to areas where asbestos activities will take place. The notification should include the presence, location, and quantity of ACM at the site and can be verbal or written. EHS accomplishes this task by sending a written notice to the building contact(s) for the area prior to abatement activities. The building contacts are then expected to convey the information to the affected persons.

This notice is also sent to the Construction Project Manager who is instructed to inform other employers of employees, i.e. other contractors, who may be working in the area. The in-house abatement members accomplish notification on their own through the use of a fill-in form that is posted outside the work areas and/or verbally to individuals in area prior to start of work. Refer to [Appendix B](#) for examples of these notification forms.

2. **State of Michigan Notification** – Asbestos abatement contractors are required to submit notification forms to the [Michigan Department of Licensing and Regulatory Affairs \(LARA\)](#), for all removals of regulated asbestos materials exceeding 10 linear feet or 15 square feet.

They are also required to submit notification to the [Michigan Department of Environmental Quality \(MDEQ\)](#) for removals of regulated material exceeding 260 linear feet or 160 square feet.

The University in-house personnel are required to submit notification to the MDEQ only if their jobs are above the cutoff limits. Notifications **must** be filed 10 days (calendar days for LARA, working days for MDEQ) prior to the start of the job. Copies of all notifications are maintained at EHS and should be posted at the job site for the duration of the project. Any changes to the notification **must** be approved by the agency.

Regulated Areas

All Class I – III work **must** be conducted within a *regulated area*. A regulated area **must** have the following:

1. **Must** be demarcated in a manner to restrict persons from entering and protect from exposure to airborne asbestos.
2. **Must** have signs posted with the following information:

**DANGER
ASBESTOS
MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY**

and

**WEAR RESPIRATORY PROTECTION AND
PROTECTIVE CLOTHING IN THIS AREA**

(If required for the type of work.)

3. **Must** require the use of respirators, if required, prior to entry.
4. **Must** not allow employees to eat, drink, smoke, chew tobacco or gum, or apply cosmetics.
5. **Must** be supervised by a competent person.

Under no circumstances is a University employee that has not been trained as an asbestos worker allowed to enter a regulated area. Special provisions will be made by EHS for emergency personnel depending on the situation.

Methods of Abatement

All asbestos abatement contractors and in-house employees **must** follow all requirements for work practices as outlined in Part 3 of "[Section 028213 – Asbestos Remediation of the University Master Specification](#)".

Respiratory Protection

Abatement Contractors are responsible for their respiratory protection program and issuance of employee respirators. University employees will be issued respirators by the EHS department, as

required. All employees **must** be medically cleared for respirator use prior to issuance. (Refer to the EHS [Respiratory Protection Program Guideline](#) for details.)

Respirators **must** be worn when conducting the following:

1. All *Class I* activities;
2. All *Class II* activities where ACM is not intact;
3. All Class II and *III* activities where wet methods are not used;
4. All Class II and III activities that do not have a negative exposure assessment;
5. All Class III work involving thermal systems insulation or surfacing materials;
6. All work where employees are exposed above the PEL/EL;
7. In emergencies.

Respiratory protection that may be issued for asbestos activities includes the following: half-face or full-face tight-fitting air-purifying respirators with *HEPA* cartridges and Powered Air-purifying respirators (PAPR) with a HEPA filter. All respirators will be quantitatively fit tested at EHS and all mandatory users will be required to be fit tested annually.

Protective Clothing

University employees will be supplied with protective clothing consisting of disposable Tyvek® suits. The suits are required to be worn during Class I operations involving greater than 25 linear feet or 10 square feet, or any operation without a negative exposure assessment, or any operation where exposures will exceed the PEL or EL.

Suits should be routinely inspected for rips or tears while working. Damaged suits should be mended or immediately replaced. All contaminated suits should be disposed as asbestos waste.

Hygiene Facilities

Decontamination areas **must** be established for Class I work that is greater than 25 linear or 10 square feet of thermal system insulation or surfacing materials. It **must** be set up adjacent and connected to the regulated area. All employees **must** exit and enter through the decontamination area that **must** consist of an equipment room, shower area, and clean room in series.

Decontamination is also required for Class I work involving less than 25 linear or 10 square feet, or Class II and III work where exposures exceed the PEL or EL, or where there is no Negative Exposure Assessment. An equipment area **must** be established adjacent to the regulated area for the decontamination of employees and equipment.

It **must** consist of an impermeable dropcloth on the floor surface. Work clothes **must** be HEPA vacuumed before removal, all equipment **must** also be cleaned prior to removal and employees **must** enter and exit through the equipment room from the regulated area.

Training Requirements

To avoid potential exposure, and in accordance with regulations, only trained and qualified individuals may disturb ACM. Contact EHS for training, if employees fall into one of these groups or are otherwise likely to disturb ACM:

Class I and II Training

Required training for activities that involve the removal of asbestos containing materials which include, but are not limited to the following: thermal systems insulation, surfacing materials, wall board, floor tile and sheeting, ceiling tile, roofing materials, and siding. Training is 32 hours for worker level and 40 hours for competent person level.

If individuals are to be trained in Class II operations only, the training will consist of a minimum of 8 hours with hands-on training for the type of material that will be removed. Annual refreshers are required for both classes.

Class III Training

Required training for activities that involve the *disturbance* of thermal system insulation or surfacing materials for the purpose of conducting repair or maintenance activities only. Training is 16 hours with a 4-hour refresher annually.

Class IV Training

Class IV training is required for all maintenance and custodial staff that work in buildings that have asbestos containing materials. Initial training is 2 hours with refreshers required annually.

Housekeeping and Disposal

All asbestos-containing flooring materials **must** be maintained in the following manner:

1. Sanding of flooring material is prohibited.
2. Stripping of finishes should be done using low abrasion pads at speeds lower than 300 rpm and wet methods.
3. Burnishing or dry buffing should only be done on flooring that has sufficient finish so that the pad cannot contact the flooring material.

All asbestos waste and debris **must** be promptly cleaned up by properly trained workers and disposed in the proper manner. Only HEPA filtered vacuums may be used when vacuuming asbestos materials. All asbestos waste needs to be disposed in an Asbestos-accepting Type II landfill. Refer to the "[Section 028213 – Asbestos Remediation of the University Master Specification](#)" for specific waste handling procedures for each type of material.

Abatement contractors are required to arrange for disposal at a proper landfill location and supply EHS with the final disposition records upon receipt. In-house employees **must** deliver the waste to the asbestos dumpster located at EHS's North Campus Transfer Facility at 1655 Dean Road. A [waste shipment record](#) **must** be turned in to the secretary at the North Campus Transfer Facility before waste is deposited into the dumpster.

Medical Surveillance

The Environment, Health & Safety Department maintains a Medical Surveillance Program in conjunction with [U-M Occupational Health Services](#). All employees who engage in Class I, II, or III work or are exposed at or above the permissible exposure limit for a combined 30 days or more per year will be included in the program for asbestos exposure. Employees otherwise required by this standard to wear a negative pressure respirator, **must** be physically able to perform the work and use the equipment. This determination shall be made under the supervision of a physician.

EHS also offers the same medical surveillance examination to employees with significant past asbestos exposure at the University. Involvement is voluntary and is aimed at those individuals who worked with asbestos containing materials routinely, prior to public knowledge of the health effects of asbestos exposure or regulations governing disturbance of ACM. Contact EHS at 7-1142 if interested in being included for past exposure or indicate on medical surveillance form.

Medical Surveillance is required upon assignment to a job involving asbestos exposure as indicated previously and annually thereafter. Medical Surveillance will be conducted annually in accordance with the [University Protocol for Asbestos Medical Surveillance](#).

The evaluation can be obtained by indicating that an employee is an asbestos worker on the [Medical Surveillance Request Form](#). The form can be requested from EHS by calling 5-2140 or accessed from the EHS website. The completed form will be evaluated by EHS, and the employee will be contacted directly by the clinic to schedule an appointment.

Recordkeeping

All objective data and sampling data for asbestos projects are maintained at EHS offices. The data will be maintained for as long as it is relied upon. Any information regarding abatement projects will be maintained for the duration of ownership of the building.

All records regarding employee exposures are maintained at EHS offices. These records **must** be maintained for 30 years.

Medical Surveillance information regarding asbestos exposures will be maintained by the University's Health Care Provider. The physician's written opinion will be maintained in an employee file at EHS offices. All information will be maintained for the duration of employment plus 30 years.

Training records will be maintained at EHS offices for 1 year past the last date of employment.

Referenced Documents

- [EPA – Managing Asbestos in Place](#) – A Building Owner's Guide DOCUMENTS to Operations and Maintenance Programs for Asbestos Containing Materials
- [OSHA – Asbestos Standard for General Industry](#) – An Overview
- [EHS Respiratory Protection Guideline](#)
- [ATSDR – Toxicological Profile for Asbestos](#)
- [ATSDR – ToxFAQ for Asbestos](#)

Technical Support

All referenced guidelines, regulations, and other documents are available through EHS (7-1142).

Attachments

- Appendix A – [Master Specification “Section 028213 – Asbestos Remediation”](#)
- Appendix B – [Example Occupant Notification Forms](#)
- Appendix C – [University Waste Shipment Record](#)
- Appendix D – [EHS Protocol for Asbestos Medical Surveillance](#)