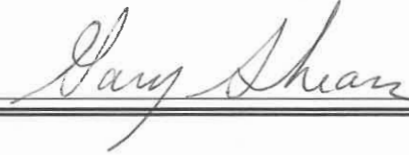


POLICY: IV: 01- Asbestos Control

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Procedure Review: Annually

APPROVED: Executive Director of Facilities and Construction



**I. PURPOSE**

The purpose of this procedure is to safeguard and control the hazards to the university community from exposure to asbestos. This is accomplished by compliance with related asbestos control requirements promulgated by the Environmental Protection Agency (EPA), the Occupational Safety and Health Agency (OSHA), Virginia Occupational Safety and Health (VOSH), and the Virginia Department of General Services.

**II. DEFINITIONS**

- A. ACM (Asbestos Containing Material) - Any material that contains more than 1% Asbestos.
- B. ACBM- Asbestos containing building material(s).
- C. Air monitoring - Sampling of asbestos fiber concentrations within the asbestos control area, which is representative of the airborne concentrations of asbestos fibers, which may reach the breathing zone.
- D. Amosite (Brown Asbestos) - An asbestiform mineral of the amphibole group containing approximately 50% Silicon and 40% Iron (II) Oxide, and is made up of straight, brittle fibers, light gray to pale brown in color, found in approximately 5% of all ACM.
- E. AMP - (Asbestos Management Plan) - Record of ACBM within a building with procedures for response actions, operations and maintenance. Presently located in the Facilities Management engineering office in the University Services Building.
- F. Asbestos - A generic name given to a number of naturally occurring hydrated mineral silicates that possess a unique crystalline structure, are incombustible in air, and are separable into fibers. Asbestos is found in a variety of building and building related materials, such as thermal insulation, roofing shingles, paint, ceiling tiles, floor tiles, and chemical fillers, as well as in brake linings and other auto products. Asbestos includes the asbestiform varieties of chrysotile (serpentine); crocidolite (riebeckite); amosite (cummington-grunerite); anthophyllite; tremolite; and actinolite. Asbestos is hazardous to your health.
- G. Chrysotile (white asbestos) - The only asbestiform mineral of the serpentine group containing approximately 40% each of silica and magnesium oxide. It is the most common form of asbestos used in buildings and is found in approximately 95% of all ACM.
- H. CIH- Certified Industrial Hygienist

- I. Class I - Removal of TSI, surfacing ACM and presumed asbestos containing material (PACM). Class I tasks will normally be done by a certified asbestos contractor.
- J. Class II- Removal of asbestos that is not TSI or surfacing ACM. Includes wallboard, floor tile, roofing materials, mastics and siding. Employees working with Class II tasks require a total of 24 hours of training.
- K. Class III- Repair and maintenance operations where ACM is likely to be disturbed. Employees working with Class III tasks require a total of 16 hours of training.
- L. Class IV- Maintenance and custodial activities during which employees contact ACM and PACM and activities to clean up it. Employees working with Class IV tasks require 2 hours of "Awareness" training.
- M. Friable asbestos material- Material that is capable of being crumbled, pulverized or reduced to powder by hand pressure, or which under normal use in maintenance, emits or can be expected to emit fibers into the air.
- N. HEPA filter equipment- High efficiency particulate air equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall be 99.97% efficient for retaining particles and fibers with a minimum dimension of 0.3 micrometers or larger.
- O. Major fiber release- The dislodging of 3 sq. ft. or more of surfacing material or 3 linear ft. or more of pipe insulation.
- P. NIOSH PAT Program- National Institute for Occupational Safety and Health Proficiency Analysis Testing Program.
- Q. NVLAP- National Voluntary Accreditation Program.
- R. PAC- (Presumed Asbestos Containing Material) - Presume that all thermal system insulation (TSI) and spray applied and/or troweled-on surfacing material installed before 1981 contain asbestos until proved otherwise through testing by a CIH or an accredited inspector.
- S. PCM- Phase Contrast Microscopy
- T. TEM- Transmission Electron Microscope
- U. Tremolite asbestos - Asbestos that is not mined or used commercially but is a frequent contaminant of chrysotile asbestos, vermiculite, and talc. Therefore, individuals exposed to these materials or to end-products containing these materials may be exposed to tremolite.
- V. TSI-Thermal System Insulation
- W. Vermiculite - A hydrous phyllosilicate mineral which undergoes significant expansion when heated. If asbestos contaminated vermiculite is disturbed, it could cause tiny, needle-like asbestos fibers to become airborne.
- X. Vermiculite analysis for asbestos - Vermiculite shall be analyzed in accordance with EPA 600-M4-82-020 PLM fiber identification procedures modified by the amphibole asbestiform definitions of EPA 600-R93-116. Additional analysis for asbestos content is recommended when

large amounts vermiculite may be disturbed using "Suspended Particles Fraction" in accordance with TEM/EDS ISO 10312/13794 analysis procedures.

- Y. Permissible exposure limit (PEL)- Exposure to an airborne concentration of asbestos not to exceed 0.1 fibers per cubic centimeter of air as an eight (8) hour time weighted average (TWA) as determined in 29 CFR 1926.58, Appendix A.
- Z. Personal monitoring- Sampling of asbestos fiber concentrations within the breathing zone of an employee (i.e. attached to or near the collar or lapel near the worker's face).
- AA. Time weighted average (TWA) - Representative samples are required to establish the eight (8) hour time weighted average. The TWA is an eight (8) hour time weighted average airborne concentration of fibers, longer than five (5) micrometers per cubic centimeter of air. Work shifts, which differ, from an eight (8) hour duration may require adjustments of the standard which applies.

### III. RESPONSIBILITIES

- A. Executive Director of Facilities and Construction - Ensures the campus community is kept informed of asbestos issues, that appropriate emphasis is placed on asbestos abatement projects, and adequate training and equipment are provided to support asbestos control activities. Also secures funding for long-term abatement and renovation actions, scheduled maintenance/repair actions (as necessary), and emergency response actions.
- B. Asbestos Program Manager - Shall coordinate university compliance with asbestos safety and health requirements including updating of the asbestos management plan, preparing emergency response actions, posting required signs, notifying and consulting with building coordinators on locations of asbestos within a building, and planned abatement activities.
- C. Project Managers - Ensures university contractors comply with applicable asbestos requirements in the performance of their contracts and notify building coordinators when an asbestos abatement project is scheduled for their buildings.
- D. Associate Director for Operations- Shall ensure the proper scheduling of response actions related to asbestos and ensure the training of FM employees.
- E. Engineering, Housekeeping, and Operations Managers - Shall ensure that FM engineering, maintenance and housekeeping employees comply with relevant asbestos safety and health requirements and receive the necessary training to perform their duties.
- G. Housekeeping Managers- Shall receive sufficient training identify flooring which might contain asbestos and be able to perform necessary floor upkeep.
- H. Maintenance Supervisors - Shall have sufficient training to handle asbestos identification requirements.
- I. Human Resources - Maintain medical records for employees involved with asbestos work.
- J. Risk Management staff - Assist in coordination of required initial training and annual training thereafter for affected employees. Maintain training records of maintenance, transportation and housekeeping employees

#### IV. PROCEDURE

##### A. Medical surveillance and exposure limits

1. According to the OSHA standard for asbestos, every employer must provide, or make available, medical surveillance programs for all employees who:
  - a. Are engaged in work involving exposure to asbestos or other mineral fibers at or above the level of 0.1-fiber/cc air, 8 hr. TWA for 30 or more days in a 12-month period of time.
  - b. Are required by this procedure to wear negative pressure respirators.
2. People medically supervised have permissible exposure limit (PEL) of 0.1-fibers/cc air, 8 hour TWA with a short duration of excursion level of 1.0 fiber/cc for 30 minutes.

NOTE: 0.1 fiber/cc means that 0.1 fibers are present in each cubic centimeter (cm) of air. Since there are 1,000,000 cc in 1 cubic meter(m), there would be 100,000 fibers in a cubic meter.

3. Prior to receiving formal asbestos worker training, associates shall undergo a complete physical exam including an EKG, pulmonary function test, and chest x-ray, to determine the fitness of the worker candidate. Associates who receive formal asbestos worker training shall also undergo annual pulmonary function testing in accordance with OSHA guidelines. These physicals and tests shall be conducted by a university contracted physician. Results of physicals and tests shall be confidential and maintained by Human Resources.

##### B. Cleaning techniques

Routine cleaning of facilities shall not result in disturbing ACM. No cleaning methods can be used that could result in the release of asbestos fibers. Mechanical stripping, drilling or sanding of asbestos containing floors, mastics, walls and ceilings, hose spraying of pipe insulation, and all similar activities that could disturb ACM shall not be used.

##### C. Renovation/demolition projects

By state law, no renovation project can proceed without a complete inspection by a licensed asbestos inspector. Major maintenance, renovation and/or demolition projects involving ACM must be evaluated by the asbestos program manager for appropriate action. In most cases removal of ACM will be required prior to the major maintenance, renovation or demolition project. Such removal shall be performed by a qualified asbestos abatement contractor. If a current project is determined to involve previously unidentified ACM, all related work shall be stopped until the asbestos program manager can evaluate the necessity for abatement.

##### D. Maintenance/repair work

1. Personnel entering areas identified as containing ACM or PACM (i.e. mechanical equipment spaces, crawl spaces, etc.) shall be appropriately trained.
2. Employees, who in the course of a normal or emergency situation, may be required to remove or disturb ACM or PACM shall receive training.

3. Equipment repairs involving the disturbance of ACM or PACM shall be halted and the asbestos program manager shall be contacted to determine the proper response action.
4. Maintenance work involving the disturbance of any amount of ACM or PACM shall be brought to the attention of the asbestos program manager by the project supervisor. A qualified asbestos abatement contractor shall be hired to remove the subject material before repairs can be made.
5. In areas with known ACM or PACM, the following procedures shall be followed whenever any friable ACBM is present:
  - a. Signs shall be posted.
  - b. Non-friable ACBM must be treated as friable when the material is about to become damaged.
  - c. Periodic surveillance must be conducted at least once every three months (continuously by maintenance personnel) to include:
    - i. Visual inspection.
    - ii. Record any condition changes date and name.
    - iii. Submit recorded changes to asbestos program manager (include in management plan).
  - d. At least once after completion of the inspection and before initiation of any response action an initial cleaning shall be performed with the following procedures:
    - i. HEPA vacuum or steam clean carpets.
    - ii. HEPA vacuum or wet clean floors and all other horizontal surfaces.
    - iii. Dispose of debris, filter, mop heads and clothes in sealed leak tight containers.
  - e. When maintenance and operations activities disturb friable material:
    - i. Restrict entry to the area and post signs.
    - ii. Shut off or modify the air handling system.
    - iii. Use necessary controls to inhibit spread of released fibers with wet methods, protective clothing, HEPA vacuums, mini enclosures and glove bags.
    - iv. Clean fixtures or other components.
    - v. Place debris and other cleaning materials in a sealed leak tight container.

E. Fiber release episodes

1. A major fiber release episode is defined as falling or dislodging more than three square or linear feet of friable ACBM. Perform the following procedure:
  - a. Restrict entry to the area and post signs.
  - b. Contact the asbestos program manager.
  - c. Shut off or modify the air handling system.
  - d. Initiate response actions using accredited persons.
2. A minor fiber release episode is defined as falling or dislodging three (3) square or linear feet or less of friable ACBM. Perform the following cleanup procedure:
  - a. Restrict entry to the area and post signs.
  - b. Contact the asbestos program manager.
  - c. Shut off or modify the air handling system.
  - d. Saturate the debris.
  - e. Place asbestos debris in a sealed, leak tight container.
  - f. Repair the area or implement appropriate response action.

F. Response actions

1. Response actions shall be selected, designed, implemented and conducted in a timely manner by accredited persons:
  - a. Project designer/manager
  - b. Contractor
  - c. Workers
2. Damaged or significantly damaged thermal system (pipes, boiler, etc.):
  - a. Repair damaged area.
  - b. Remove damaged material if repair is not feasible.
  - c. Maintain material and coverings in intact and undamaged condition.
3. Damaged friable surfacing ACBM or damaged friable miscellaneous ACBM:
  - a. Encapsulate, enclose, remove or repair damaged material.

- b. Use local circumstances to help choose: occupancy, use patterns, economic concerns, etc.
- 4. Significantly damaged friable surfacing ACBM or significantly damaged friable miscellaneous ACBM:
  - a. Immediately isolate unless not necessary.
  - b. Remove the material, enclose or encapsulate.
- 5. Potentially damaged friable surfacing, thermal or miscellaneous ACBM; do the operation and maintenance activity.
- 6. Potentially significant damaged friable surfacing, thermal or miscellaneous ACBM:
  - a. Perform operation and maintenance activity.
  - b. Use control measures to prevent damage, deterioration or delamination.
  - c. Remove ASAP, unless:
    - i. Prevention controls are effectively implemented.
    - ii. Other response actions are preferred because of technological or economic factors.

G. Completion of response actions

The project manager shall:

- 1. Conduct visual inspection to determine proper completion.
- 2. Perform aggressive clearance air sampling as specified by the asbestos program manager.
- 3. Request air sample analysis by an accredited lab preferably in Virginia.
  - a. PCM (Phase Contrast Microscopy)
    - i. Lab shall be NIOSH PAT (Proficiency analysis test) program proficient.
    - ii. Analyzer shall be a graduate of NIOSH 582 or equivalent course.
    - iii. NIOSH 7400 methodology shall be utilized.
  - b. TEM (Transition Electron Microscope)
    - i. NVLAP (National voluntary laboratory analysis program) accreditation within six months of availability.
    - ii. Firms shall submit proof of accreditation for the lab and any subcontracting labs.

## H. Specific Procedures

1. Floor tile - Floor tiles on campus shall be assumed to contain asbestos unless otherwise identified by the asbestos program manager. Floor tile manufacturers have warned that all 9" x 9" and most 12" x 12" tile manufactured before 1986 did contain asbestos. More importantly, the fibers are usually too small to be detected with an optical microscope.
  - a. Acceptable practices for floor tile maintenance:
    - i. Wet buffing with soft (red/pink) buffing pads.
    - ii. Chemical stripping and cleaning.
    - iii. Waxing - a good-waxed surface provides a natural barrier to abrasion and fiber release.
  - b. Loose floor Tile:
    - i. Report all loose floor tile incidents to the asbestos program manager.
    - ii. Loose pieces of floor tile shall be picked up and placed into plastic bags. The bags can be placed in cardboard boxes to prevent puncture. The asbestos program manager shall direct the proper disposal of all tiles containing asbestos.
    - iii. Carpet shall be placed over the bare mastic (glue) until the tile is replaced.
    - iv. No partially loose tile shall be pried up.
  - c. Non-acceptable practices for floor tile maintenance:
    - i. Dry buffing
    - ii. Dry stripping
    - iii. Sanding
    - iv. Drilling
    - v. Carpet removal where carpeting has been installed over floor tile.
    - vi. Removal by untrained personnel.
2. Sheet flooring - Both the hard and soft forms of this product typically have a non-asbestos vinyl surface and an asbestos-containing backing. This backing may contain as much as 55% asbestos. Normal cleaning procedures can be used on undamaged sheet good products.
  - a. Damaged sheet flooring shall be reported to the asbestos program manager.



- b. Non-acceptable practices for sheet flooring:
  - i. Cutting
  - ii. Drilling
  - iii. Sanding
  - iv. Removal by untrained personnel
- 3. Transite panels - This extremely hard product is often found in siding on buildings, lining of cooling towers and the lining of chemical exhaust hoods in the science labs.
  - a. The asbestos program manager shall be informed of any activities that will physically disturb the panels.
  - b. No physical modification (cutting, drilling, sanding, etc.) is allowed.
  - c. The access panels in lab hoods are attached with screws that tap into a metal brace behind the panel. Therefore, the access panels can be removed safely without the danger of fiber release.
- 4. Transite piping, conduits and ducts:
  - a. The asbestos program manager shall be informed of any activities that may disturb these products.
  - b. These products shall only be removed, cut or repaired by specially trained personnel.
- 5. Kemstone panels and counter-tops - This asbestos containing material is similar to transite and is found in exhaust hood linings and counter-tops. The procedure for Transite Panels shall apply to Kemstone as well.

I. Possible locations of ACM

- 1. Surfacing materials: sprayed or toweled on walls and ceilings.
- 2. Thermal insulation: batts, blocks, pipe coverings and gaskets.
- 3. Cementations: panels, roof tiles, clapboard, shingles and mud on pipe joints.
- 4. Paper Products: corrugated and millboard.
- 5. Roofing Felts: found on shingles and pipelines.
- 6. Compounds: caulking, putties, adhesives, joint compound, roofing asphalt, mastics, roof putty, plaster, stucco, spackles and sealants.
- 7. Ceiling tiles: lay-in and glued on.

8. Flooring tile and sheets: vinyl asbestos tile (VAT), asphalt asbestos tile, sheet goods such as resilient vinyl sheet flooring.
9. Wall Coverings: vinyl wallpapers.
10. Paints and coating: roof coatings, airtight aluminized paint.
11. Auto products: brake pads, clutch and gaskets.

## V. TRAINING

Annual training awareness is required for all custodial, auto repair and maintenance associates who may work in a building that contains ACBM. This training is scheduled through Risk Management with the asbestos program manager and the appropriate supervisor. This training shall include:

1. A review of this procedure.
2. The characterization of asbestos.
3. Information on health effects, asbestos related diseases/conditions.
4. Locations of ACBM throughout each building in which they work.
5. Recognition of damage, deterioration and delamination of ACBM.
6. Name and phone number of the asbestos program manager and the location of the asbestos management plan.

## VI. RECORDKEEPING

- A. Documents relating to asbestos materials shall be maintained for at least 30 years. The asbestos program manager shall be responsible for maintaining files of asbestos documentation excluding associate medical data.
- B. Human Resources shall maintain all health-related records for all employees involved with asbestos work. The medical record for each employee shall be preserved and maintained for at least the duration of employment plus thirty (30) years.
- C. Risk Management staff shall maintain training records.
- D. Asbestos related files shall be identified with warning labels (provided by the asbestos program manager) to prevent inadvertent destruction.