

Virginia Tech's

**Asbestos Operations and Maintenance
Program**

Administered by
Environmental Health and Safety Services
231-5985

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TABLE OF CONTENTS

Section	Page(s)	
1.0	1	Introduction to the Asbestos Operations and Maintenance Program
1.1	2	Who Should Participate
2.0	3	Program Elements
2.1	3-6	Education and Training
2.2	6-10	Occupant Awareness
2.3	10-12	Building Surveys and Hazard Assessments
2.4	13-15	Exposure Monitoring
2.5	15-16	Recordkeeping
2.6	16	Management
3.0	17	Work Order Permit Review System
3.1	17	Purpose
3.2	17-18	Participants
3.3	18-21	Completing the Work Order Review Form
3.4	21	Recordkeeping
4.0	23	Standard Work Practices and Procedures
4.1	23	Introduction
4.2	23-24	Personal and Work Area Air Monitoring
4.3	24	Providing Notice to EHSS
4.4	24-25	Providing Notice to OSHA and EPA
4.5	25-26	Equipment
4.6	26	Development of Standard Work Practices and Procedures

Standard Work Practices and Procedures:

Fiber Release Episodes: Designated Building Liaisons' Responsibilities
Fiber Release Episodes: Workers Responsibilities
General: Small-scale, Short-Duration Work Practices and Procedures
Entry into an Asbestos Contaminated Work Area
Asbestos Floor Tile and Mastic Removal
Glovebag Removal of Pipe Insulation
Removal of Asbestos Ceiling Tile
Routine Cleaning in Areas with Known or Suspect ACM

Appendices:

Appendix A Glossary
Appendix B Respiratory Protection
Appendix C Forms
Appendix D Regulations

PREFACE

The University has implemented an Asbestos Operations and Maintenance Program (O&M) to ensure the safety of employees who may work in the vicinity of, or who may remove, asbestos-containing materials (ACM) as part of their job duties, and to minimize the exposure of building occupants and maintenance and custodial personnel to airborne asbestos fibers.

The O&M Program was created by Environmental Health and Safety Services (EHSS) in 1989 in an effort to control, limit and monitor exposures to airborne asbestos fibers. Employees at risk for exposure are provided training, access to appropriate personal protective equipment, and medical examinations. The O&M Program was substantially revised in 1993, and this document was created as a guideline for all participants.

This document has been reviewed and approved by the Asbestos Management Committee, consisting of the following individuals:

John Beach	Physical Plant
J. B. Sutphin	Facilities Planning and Construction
Larry Lawrence	University Budget Office
Kay Heidbreder	University Legal Counsel
Doug Jones	Communications Network Services
Robert Rankin	Communications Network Services
Richard Chuses	Residential Programs
Howard Bucknam	Dining Programs
Zack Adams	Environmental Health and Safety Services

1.0 Introduction to the Asbestos Operations and Maintenance (O&M) Program

The principal objective of the Asbestos Operations and Maintenance Program is to minimize the exposure of building occupants and maintenance and custodial personnel to airborne asbestos fibers by:

1. The survey, inventory and periodic reassessment of all suspect and known asbestos-containing materials (ACM). The purpose of the reassessment is to monitor the condition of ACM to ensure that ACM is maintained in an undamaged (non-hazardous) condition.
2. Ensuring that asbestos fibers that have been previously released are properly cleaned-up.
3. Training individuals who may encounter ACM during their normal work activities.
4. Developing work practices and procedures that will allow renovation, construction or emergency maintenance to be performed safely without exposing employees, building occupants, or members of the public to airborne asbestos fibers. These procedures include the Work Order Permit Review System, which is explained in detail in Section 3.0 of this document, and Standard Work Practices and Procedures, which are outlined in Section 4.0.

This program has been designed to comply with applicable state and federal regulations pertaining to asbestos. This program shall remain in force until all ACM has been removed from all university properties.

Background information on asbestos and the health effects related to asbestos exposure is available through Environmental Health and Safety Services (EHSS). Interested persons may request this information by contacting EHSS at 231-6775.

1.1 Who Should Participate

The Asbestos O&M Program is administered by the Environmental Safety Division of EHSS. EHSS personnel coordinate sampling of suspect ACM, maintain all asbestos-related records, monitor asbestos removal operations not associated with capital projects, periodically reassess suspect and known ACM, and review proposed work to be conducted by Physical Plant, CNS, Residential Housing and other departments.

Other key university participants include:

- Building maintenance and supervisory personnel

- Custodial staff and supervisory personnel
- Personnel involved in building renovations or demolition
- Utilities personnel
- Departmental personnel involved in the placement of communication or power cables
- Facilities Planning and Construction personnel, including Leased Property Management
- Designated building liaisons
- Designated departmental contacts, and,
- Safety coordinators at remote research stations.

2.0 Program Elements

2.1 Education and Training

2.1.1 Custodial and Maintenance Training

All maintenance and custodial staff who perform duties that do not involve the removal or disturbance of ACM shall receive training on an annual basis. Training will include:

1. Asbestos characteristics and typical uses of ACM
2. Health effects of asbestos exposure and the combined effects of smoking and asbestos exposure
3. Purpose of the Asbestos O&M Program
4. Recognition of damaged ACM, and the response that should be made if damaged ACM or suspect ACM is found

Information on the identification and location of ACM, types of asbestos, and the health effects related to asbestos exposure may be obtained by contacting EHSS at 231-6775.

2.1.2 Worker Training: Small-scale, Short-duration Asbestos Projects

Maintenance personnel who perform duties that involve small-scale, short-duration removal or repair of ACM, or that are required to work in environments contaminated with ACM, shall receive 14-hours of training in addition to the 2-hour awareness training. Training shall include:

1. Approved asbestos work practices and procedures
2. Implementation of operations, maintenance and repair programs
3. Worker protection, including use of personal protective equipment
4. Fiber release episodes
5. Each employee shall receive hands-on training to include:
 - a. Setting up containment
 - b. Decontamination procedures

- c. Glove bag operations
 - d. Use of tools and equipment approved for use with asbestos
6. Each employee shall receive training on the Standard Work Practices and Procedures set forth in this section
 7. Recordkeeping requirements
 8. A review of the requirements of 1910.1001

Employees who perform asbestos repair or removal operations other than small-scale, short-duration shall meet the training requirements established by the Virginia Department of Commerce (DOC) for an Asbestos Worker.

All personnel required to wear respiratory protection or that perform minor repair or maintenance work involving asbestos materials shall receive training on respiratory protection and approved asbestos-related work practices and procedures. The requirements of the Respiratory Protection and Medical Surveillance Programs may be obtained by contacting EHSS at 231-6775.

2.1.3 Inspector, Management Planner, Supervisor, Designer, Project Monitor Training and Team Leader Qualifications

Personnel that sample suspect ACM, conduct building inspections, and that perform hazard assessments shall meet the minimum qualifications for **Asbestos Inspector** as established by the DOC.

Personnel that develop response actions, or that make recommendations for removal procedures, shall meet the minimum qualifications for **Asbestos Management Planner** and/or **Asbestos Project Designer**, as appropriate, as established by DOC.

Personnel that monitor asbestos projects, that secure asbestos air samples during an asbestos project, that perform final visual inspections and final clearance air sampling shall meet the minimum qualifications for **Asbestos Project Monitor** and **Asbestos Supervisor** as established by DOC, and shall meet the definition of "competent person" as defined by the EPA.

Personnel that coordinate sampling and assessments, and that monitor and develop response plans that require modification to the O&M plan shall meet the minimum qualifications of "**Team Leader**" as established by the Virginia Department of General Services (DGS). A team leader shall possess, at a

minimum, a college degree in a physical science (e.g. engineering, geology, etc.), and have a minimum of three years experience in conducting field assessment surveys for asbestos containing materials in buildings.

The university's O&M program will be managed by the **Asbestos Coordinator** at EHSS. The Asbestos Coordinator must meet the licensing requirements of DOC for Asbestos Inspector, Management Planner, Project Designer, Project Monitor, and Supervisor, shall be a "competent person" as established by 29 CFR Part 761 and "team leader" as established by DGS.

2.1.4 Designated Building Liaison

Physical Plant and Residential and Dining Programs shall designate one member of the custodial and/or maintenance supervisory personnel to serve as the liaison to coordinate the specific efforts of the asbestos program within the particular building to which the liaison is assigned.

The designated contact shall receive training in addition to the 2-hour asbestos awareness training. This training shall include:

- Interpreting the information contained in the building asbestos profile(s);
- Use of the Fiber Release Episode form,
- Conducting building inspections and hazard assessments, and
- Instruction in how to request assistance from EHSS if suspect or known ACM is damaged or disturbed and the method for reporting damage to suspect and known ACM.

2.2 Occupant Awareness

2.2.1 Building Occupant Awareness

- A. Occupants of buildings will be made aware of the existence of the Asbestos O&M Program, and will be provided access to this document upon request. Occupants will, in addition, be made aware that ACM may be present in their workplace, and will be cautioned that ACM is not to be damaged or disturbed except under controlled conditions by trained personnel. Occupants may review asbestos-related building survey records either by contacting their designated building liaison, or by contacting EHSS at 231-6775.
- B. Prior to the start of an asbestos abatement project, additional information will be provided to building occupants that will explain the work that is to be performed,

and the measures that are being employed to protect them. This information will be made available either at group meetings, or by letter, the use of media resources, or a combination of the above.

2.2.2 Building Preventative Maintenance and Custodial Supervisors

Preventative maintenance personnel and custodial supervisors that are not designated building liaisons will be provided, at the first opportunity, with a complete record of the location of all suspect and known ACM in the buildings for which they are responsible.

2.2.3 Designated Building Liaison

The designated building liaison shall be provided with a building asbestos profile for each building. This profile shall:

- Include information regarding product type, specific location, estimated quantity, type and percentage of asbestos content, and physical condition;
- Be kept in the possession of the person designated at a location in the building where it is readily accessible to building employees or their designated representative;
- Be updated as surveillance, test results and/or response actions are undertaken in the building.

2.2.4 Work Order Review System

It is the mandate of the Virginia Department of General Services, and the administration of Virginia Tech, that no renovation, alteration of a building material, or maintenance activity will occur that has not been reviewed either by EHSS or a licensed asbestos consultant for the possibility of contact with, or disruption of, ACM, or the presence of damaged or deteriorated ACM in the work area.

- A. All departments shall follow the guidelines of the Work Order Review System detailed in this document if they:
- Conduct maintenance, renovation or repair activities,
 - Conduct work in asbestos contaminated work environments (e.g. pipe chases, crawlspaces or other building areas where deteriorated or damaged ACM may be present),

- Work with ACM during machinery repair (for example, during the replacement of asbestos brake shoes or clutch pads), or,
- Conduct any work or operation that potentially impacts ACM.

A copy of the Work Order Review Form shall be maintained at the work site throughout the course of the project.

B. Distribution of Information: Each department that conducts building repair, renovation or maintenance work as detailed in 2.2.4 shall delineate a chain-of-command and a departmental contact person(s) who will be responsible for:

1. Requesting the sampling by EHSS of suspect ACM that will be disturbed by the work
2. Requesting a review by EHSS of proposed work that is to be conducted in the vicinity of known or suspect ACM
3. Distributing work orders that have been reviewed by EHSS

The departmental contact will be provided with building asbestos profiles for all buildings in which the department conducts work. The departmental contact person may use this information to review proposed work, in lieu of a review by EHSS, where all suspect materials have been sampled, and ACM or suspect ACM will not be disturbed.

2.2.5 Building Signage

A. Signs and Labeling of ACM

A labeling program will be implemented to identify known ACM in university buildings. The number and location of these signs or labels shall be sufficient to clearly identify ACM in routine maintenance areas. Labels shall conform to current OSHA standards.

Non-asbestos thermal system insulation (TSI) installed in areas with existing ACM TSI shall be labeled as either "Asbestos Free" or "Non-asbestos" by the installer. If the non-asbestos product is installed in-line with existing ACM (for example, on the same run of pipe), then the boundary between ACM and non-ACM shall be clearly delineated.

Signs or labels may be substituted for by employee training and the distribution of records in accordance with sections 2.1.1, 2.1.2, 2.2.2 and 2.2.3 of this document for some types of ACM. These types include: asbestos-containing

floor tile and linoleum, asbestos-cement ceiling tile and ductwork, and other types of non-friable ACM maintained in good condition and repair.

The provisions of this section do not apply to ACM that has been modified by a bonding agent, coating, binder or other material provided that it can be demonstrated that during any reasonably foreseeable use, handling or storage, no airborne asbestos fiber concentrations will be generated in excess of the action level and/or excursion level.

Reasonable precautions shall be taken to ensure that labels remain visible. During painting or other operations where labels will be hidden or covered, existing labels shall either be removed and new labels affixed after painting, or existing labels shall be otherwise protected.

B. Contaminated Building Areas

Signs conforming to the current OSHA standards shall be posted restricting access to building areas that are contaminated with ACM debris where it has been demonstrated, or can reasonably be expected, that airborne asbestos fiber concentrations exceed the PEL (e.g. regulated area). Signs shall read:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA

A secondary sign shall be posted that will direct the worker to contact EHSS @ 231-5985 for assistance.

Signs shall be posted restricting access to building areas that are contaminated with ACM debris where airborne asbestos fiber concentrations do **not** exceed the PEL. Signs shall read:

WARNING
AREA CONTAMINATED WITH ASBESTOS DEBRIS
AVOID CREATING DUST
AUTHORIZED PERSONNEL ONLY
CONTACT EHSS @ 231-6775 FOR ACCESS

Access to contaminated building areas may be restricted by limiting the availability of keys to these areas to personnel with appropriate asbestos-related training, who will enter only under the supervision and/or direction of EHSS personnel.

2.2.6 Contractor Awareness Program

Contractors employed by the university shall be informed by the departmental project supervisor of the location of suspect and known ACM in the work area to which they are assigned. Contractors shall, under no circumstances, damage or disturb suspect or known ACM unless they are a licensed Asbestos Abatement Contractor and have been specifically employed to perform asbestos removal.

The departmental project supervisor shall provide contractors with either a copy of the completed Work Order Review Form or a comprehensive asbestos inspection report *specific to their work and the materials that are to be disturbed*.

The university project supervisor shall caution contractors that they shall not proceed with any change in work that requires that a material be disturbed that the Work Order Review Form shows has not been previously been tested (e.g. "suspect" ACM). If a change in the scope of work becomes necessary, a new review request form shall be submitted to EHSS who will review the work for the potential to disturb ACM.

It will be the responsibility of the contractor to provide their own asbestos awareness program which shall, at a minimum, include the information contained in this section.

2.2.7 Media Information

EHSS may provide University Relations with information related to proposed asbestos abatement projects to facilitate the dissemination of this information to building occupants.

2.3 Building Surveys, Inspections, and Hazard Assessments

2.3.1 General

Hazard assessments and building inspections for the presence of asbestos shall be performed in accordance with the asbestos survey standard for buildings to be renovated or demolished promulgated by DGS. Buildings built after January 1, 1978 shall **not** be exempted unless suitable documentation can be obtained that certifies that installed materials are asbestos free. A copy of the current survey standard may be obtained by contacting EHSS at 231-6775.

2.3.2 Annual and Bi-annual Reassessment of ACM and Suspect ACM

All Virginia Tech properties that have either known or suspect ACM shall be reinspected by EHSS personnel at least semi-annually. Any change in material condition shall be noted during this inspection and, if necessary, the relative hazard posed to building occupants by this material shall be assessed.

All Virginia Tech dormitories that have friable ACM shall be inspected at least bi-annually. Any change in material condition shall be noted during this inspection, and a hazard assessment shall be made as previously stated.

If necessary, material repairs and/or minor abatement shall be performed at the first available opportunity to reduce or eliminate the hazard to building occupants.

A complete record of building inspections shall be maintained by EHSS.

2.3.3 Sampling of Suspect ACM

- A. The inspector shall, where possible, utilize the results from previous samples secured within the building area to make a determination of ACM or non-ACM. The inspector shall modify EHSS building records to clearly delineate sample locations and the homogenous area identified.

The information gathered during the annual and biannual reinspection of university buildings will be used to develop a prioritized list of suspect ACM that is damaged or deteriorated. Suspect ACM from this list will be sampled and analyzed in the order of assigned priority to determine actual asbestos content so that an appropriate response can be determined.

B. Hall-Kimbrell Environmental Services, Inc. (HK)

The university commissioned a complete survey of friable ACM by Hall-Kimbrell Environmental Services, Inc. in 1988. Extreme caution is advised if the data

gathered during the HK survey is to be utilized, because the sampling protocol used no longer meets current state standards, and the survey did not address non-friable ACM.

2.3.4 Capital Projects

Facilities Planning and Construction shall secure the services of a licensed asbestos inspector to secure samples of suspect ACM that will be damaged or disturbed by the proposed work. The inspecting agency shall prepare an inspection report in accordance with the survey standards detailed herein. The report shall include an assessment of damaged or deteriorated ACM in the work area as well as ACM in other building areas that may be damaged or disturbed by the proposed work (e.g. through traffic, construction induced vibration, and so forth). The inspecting agency shall be provided access to EHSS records and sampling data for the building(s) in question.

2.3.5 Leased Properties

A. Existing and New Leases

In accordance with the directive of the Department of General Services, the university shall take necessary precautions to ensure that no additional leases are entered or existing leases extended in buildings which contain friable asbestos which could subject employees or clients to health risks.

B. Assessment of Existing Leased Spaces

In accordance with the directive of the Department of General Services, the agency is responsible for the assessment of existing leased spaces for friable asbestos. This assessment shall, if possible, be performed through the landlord, and shall conform to current state asbestos inspection standards.

ACM not posing a hazard, as indicated in the asbestos inspection report for the facility, need not be removed as a condition for lease with the Commonwealth. An effective management plan, however, must be developed and implemented by the building owner if the ACM is to remain safely in-place.

A copy of the management plan and inspection report for the facility shall be provided to EHSS and shall be made accessible to building occupants. A copy of the annual reassessment made by the building owners representative shall be submitted to Leased Property Management, and shall be made available to EHSS.

C. Renovation of Leased Property by University Personnel

Requests for sampling of suspect ACM associated with renovation or demolition work conducted or supervised by in-house personnel shall be coordinated through Leased Property Management.

The removal, repair, encapsulation, enclosure or alteration of asbestos materials in leased spaces *shall be the responsibility of the building owner* even if the renovation or demolition project is being conducted at the request of, or is being supervised by, university personnel.

2.4 Exposure Monitoring

2.4.1 Personal Air Samples for University Personnel

EHSS shall monitor and secure personal air samples for all asbestos related work performed by university personnel. These samples shall be used to ensure that the permissible eight (8) hour time weighted average (TWA) exposure and the excursion limit established by OSHA (in 29 CFR 1910.1001 and 1926.58) is not exceeded. The cost for the analysis of these samples shall be borne by the department conducting the work. Historic sampling data may only be used if previous samples were taken during an asbestos project involving similar material types under similar material and environmental conditions.

Sampling methodology and analysis shall conform to the requirements of 29 CFR 1910.1001. A copy of this regulation may be obtained by contacting EHSS at 231-6775.

A copy of personal air sampling results shall be submitted to the employee for which the samples were secured within 15 days of receipt from the laboratory.

2.4.2 Personal Air Sampling for Non-university Personnel

Asbestos abatement contractors shall be responsible for securing air samples for their own personnel to meet the requirements of 29 CFR 1926.58.

2.4.3 Air Sampling during Asbestos Projects

A. General

The project monitor shall secure baseline (e.g. background) air samples before the start of the project, if necessary, and shall secure air samples outside of the work area during the project. The project monitor will, in addition, perform a final visual inspection and will secure final clearance air samples using aggressive air

sampling techniques (if required) as outlined in 2.1-526.14:1 of the Code of Virginia.

The work area will be considered safe for re-occupancy if all final clearance air samples are less than 0.01 fibers per cubic centimeter (f/cc) of air sampled as determined by Phase Contrast Microscopy (PCM).

Aggressive air sampling will not be performed if the work area is not contained and is not under negative pressure.

In the event that baseline air samples indicate that the background particulate load will not allow the use of PCM for analysis of final clearance air samples, and if it is not possible to establish a clean source of make-up air to the work area, then final clearance samples shall be analyzed using Transmission Electron Microscopy (TEM) in accordance with 40 CFR, Part 763.

The cost for analysis of air samples associated with asbestos projects shall be borne by the department initiating the work.

A. Non-capital Projects

EHSS will provide project monitoring services for non-capital projects if EHSS personnel are available and the scope of the removal/repair project is sufficiently small. Larger asbestos projects may require the services of an independent project monitoring consultant.

B. Capital Projects

Facilities Planning and Construction shall secure the services of a licensed Project Monitor.

The duties and function of the project monitor will include, but are not limited to, observing and monitoring the activities of an asbestos abatement contractor on asbestos projects to determine that proper work practices are used and compliance with all federal, state and local laws and regulations is maintained. The licensed project monitor will collect, at a minimum, environmental air samples during the asbestos project, perform visual inspections of the work area, and perform final visual inspections and aggressive final clearance air sampling. The number of air samples and sampling methodology shall conform to current state requirements.

The project monitor shall be on-site during all asbestos-related work activities.

2.4.4 Monitoring of Airborne Asbestos Fiber Concentrations in Buildings

EHSS will make available to university employees, upon request, documentation of the background airborne asbestos fiber levels in university buildings. EHSS will secure, if necessary, air samples to document the ambient exposure levels or may, if available, utilize existing records for this purpose.

2.5 Recordkeeping

All records mentioned in this Asbestos O&M Program shall be retained as required by the regulations and as necessary to maintain an effective program. These records shall include:

- The written O&M plan itself, including all revisions, changes and modifications
- Building plans and drawings, with identified homogenous areas and sample locations clearly delineated
- Building plans and drawings, with areas of known ACM clearly identified
- Building sampling and survey records, and records of all reinspections
- All asbestos project (abatement, repair, encapsulation or enclosure) records including, as appropriate, survey records, project design or abatement specifications, air sampling data, daily project monitor logs, sign-in logs, waste disposal manifests, and invoices. The building area affected and material removed shall be clearly identified on the building drawings.
- Attendance records at all awareness and training programs
- Medical surveillance records shall be maintained by the Health Assurance Program for 30 years past the last date of employment for an individual employee.
- Personal air sampling data
- Correspondence
- A copy of current state and federal regulations

Where all ACM of one type will be completely removed from a building, a sample of the material removed shall be retained by EHSS for any potential future legal action against the manufacturer.

Records will be maintained and will be available for inspection at the office of EHSS.

2.6 Management

The university's O&M program will be administered by the **Asbestos Coordinator** at EHSS.

The **Asbestos Management Committee** has been established to assist the Asbestos Coordinator in reviewing planned projects, formulate university policy related to asbestos, and to assign priorities to asbestos projects undertaken as a response action as a result of building inspections. Representatives of EHSS, Facilities Planning, Physical Plant, CNS, Residential Programs, Dining Programs, Leased Property, Legal Counsel and Finance are included as members of this committee.

Asbestos abatement or repair projects that become necessary as a result of changing material conditions identified during annual or bi-annual reinspections shall be prioritized for remediation by the University Asbestos Committee. Access to building areas impacted by damaged or deteriorated ACM that is not addressed during this action shall, if an airborne asbestos hazard or potential hazard exists, be restricted to trained personnel.

The department responsible for building/facility maintenance and/or repair will be provided with a prioritized asbestos project list for their building(s). A copy of the project list will also be provided to the designated building liaison. This list will be up-dated as asbestos repairs or removal is accomplished, and as the priority of these projects changes.

3.0 Work Order Permit Review System

3.1 Purpose

The purpose of the work order review system is to allow EHSS an opportunity to review all proposed **renovation, maintenance** or **repair** work that is to be completed internally by staff and/or outside contractors to insure that either:

- ACM will not be disturbed by the work
- Damaged ACM present in the work area is repaired and the area cleaned before the work begins
- Suitable precautions are taken if the work has the potential to unintentionally disturb ACM (e.g. due to the physical configuration of the area and the location of the ACM in relation to the proposed work), or,
- That ACM that will be disturbed by the work is removed either using trained university personnel or a licensed asbestos removal contractor under the supervision of EHSS or a licensed Project Monitor hired for this purpose

All **suspect** and **known** ACM in the area of the work will be identified on the review form. When the work involves, or will be conducted in the vicinity of, thermal system insulation (TSI), then all ACM TSI in the immediate vicinity of the work area will be clearly identified with the OSHA "Danger" warning label, and non-ACM TSI with an "Asbestos Free" label as appropriate.

3.2 Participants

- A. All departments that conduct work that has the potential to disturb ACM, or that work in a building area that is potentially contaminated with ACM debris, will utilize the Work Order Review System.
- B. Capital Outlay and Maintenance Reserve projects will abide by the regulatory requirements detailed in this document, but will not utilize the work order review system. Rather, the university shall contract the services of a licensed asbestos consulting and inspection firm to:
 - (1) secure samples of **all** suspect ACM that will be damaged, disturbed, removed or otherwise impacted by the proposed work,
 - (2) develop a comprehensive asbestos inspection report, and,
 - (3) develop asbestos removal, encapsulation and/or repair specifications.

Changes in the scope of work that require that suspect ACM be disturbed will necessitate that additional samples be analyzed.

3.3 Instructions for Completing the Work Order Review Form

A suggested work order review form is included in Appendix C and is shown on page 20 of this document. A department may prepare their own form for internal use and recordkeeping if the form used contains all pertinent information contained on the sample form.

3.3.1 Information to be Provided by the Department

Complete the following sections of the review form, as shown on page 16 of this document.

- Section A: Provide, if available, a work order number and the name of the supervisor that will oversee the work in the field.
- Section B: Detail the building area(s) and room(s) that will be involved in the work.
- Section C: Provide estimated start and completion dates for the field work. Turn-around: How quickly do you need the review form completed? If the project is an emergency, or if sample results are needed immediately, indicate "Priority"; note that the cost for priority analysis is substantially greater than the cost of routine analysis.
- Section D: Briefly describe the work that is to be performed and/or attach a copy of the work order.
- Section E: Review the proposed work in the field and check-off each material that you anticipate disturbing during the work.
- Section F: List any material that will be disturbed that is not included in Section E.
- Section G, H and I: Check either "yes" or "no" for these sections.

3.3.2 Information Provided by EHSS

- Section J: If all suspect materials marked in Section E and F were tested and were not ACM, then the box in Section J will be checked.

- Section K will be used to list all suspect and known ACM in the work area.
- If suspect or known ACM is present, but will not be disturbed by the work, then the box in Section L will be marked.
- If the proposed work will disturb ACM, then the box in Section M will be marked and the project supervisor will be contacted. The work, as shown by Section N, may either be revised so that the ACM will not be disturbed, or the ACM may be removed using trained personnel or the removal contractor.
- The scheduled removal start and completion dates will be shown in Section O.
- Additional comments or cautions will, if necessary, be listed in the comments section of the form.

3.3.3 Verbal Requests for a Review of Work-in-Progress

In the event that a verbal request is made for a review for the presence of suspect or known ACM on a project where work is in-progress, then EHSS personnel will complete all sections of the review form. The field supervisor should provide EHSS with the work order number or other reference number for the work.

In the event of an emergency that requires that work be performed in the field prior to a review by EHSS, then suitable precautions should be taken as detailed in Section 4.0 of this document. EHSS shall be notified at the first available opportunity. If the emergency should occur after normal working hours, then the responder should notify Virginia Tech police and request that they contact EHSS Asbestos and Environmental Safety personnel for assistance.

3.4 Recordkeeping

The completed Work Order Review form and all related information will be incorporated into the O&M building records.

4.0 Standard Work Practices and Procedures

4.1 Introduction

Standard work practices and procedures (SWP) provide specific guidelines for certain asbestos-related work activities. Adherence to SWP will minimize the production of airborne asbestos fibers and will protect the worker and building occupants.

Asbestos projects may be performed by in-house personnel without notification to OSHA and EPA if the amount of ACM involved is less than 10 square or linear feet. Note that, as shown on the attached SWP's, and as permitted by the Virginia Department of Labor, the 10 square foot limitation may not apply for certain non-friable materials. A copy of the notification form is included in Appendix F of this document.

The 10 square/linear foot limitation will, for the purposes of this document, be used to define the relative scale of a small-scale, short-duration operation. A small-scale, short-duration operation (SS/SD) is further defined as only those demolition, renovation, repair, maintenance or removal operations which are non-repetitive, affect small surfaces or volumes of ACM, will be completed within one work day, and are not expected to expose bystander employees to significant amounts of asbestos. In SS/SD projects, the removal of ACM is not the primary goal of the job; if the purpose of the SS/SD project is maintenance, repair or renovation of the equipment or space behind or covered by the ACM, then these provisions shall apply.

4.2 Personal and Work Area Air Monitoring

Personal and work area air monitoring will be used to evaluate the effectiveness of the work practices, to document exposure conditions, and to provide justification for the personal protective equipment used.

Personal air samples will be secured for **each individual** for each **type** of SWP until there is sufficient historic data available to meet the OSHA requirements. Once historic data is available, it will no longer be necessary to secure air samples **except:**

- Work area environmental and/or personal air samples will **always** be taken if the work area will be reoccupied after project completion, or if university personnel are present immediately outside of the work area (for example, glove bag removal of pipe insulation in the Power Plant, where access to an **area** can be restricted, but unprotected employees are in the same **space**).

- Final clearance samples will **always** be secured for any asbestos project that is not small-scale, short-duration.
- Personal air samples will be secured on a periodic basis by EHSS to provide continuing documentation that the personal protective equipment required by the SWP conforms to the OSHA requirements.

4.3 Providing Notice to EHSS

It is essential that EHSS be provided, if possible, with at least two weeks notice prior to any asbestos project that is not SS/SD, and three days notice prior to any SS/SD asbestos project; this will allow EHSS to schedule our personnel and ensure that a laboratory is available to analyze the air samples within the time frame required.

4.4 Providing Notice to OSHA and EPA

A 20-day notice and a project permit fee must be submitted to the DLI and federal EPA for all asbestos projects involving more than 10 linear or square feet of friable ACM. Notice must be provided to federal EPA for building demolitions **even if** no friable asbestos will be impacted by the work.

Notification of less than twenty days may be allowed in case of an emergency involving protection of life, health or property. This includes, but is not limited to: leaking or ruptured pipes; asbestos that has been accidentally damaged or that has fallen that could expose non-asbestos workers or the public; unplanned mechanical outages; or, repairs essential to a work process that require asbestos removal and that could only be removed safely during the mechanical outage. Notice may also be waived if the 20-day notice would impose an unreasonable financial burden.

Extreme caution is advised, however, in requesting waivers of the 20-day notice, as perceived abuse in requesting waivers may result in DLI disallowing waivers in the future. *Lack of planning or inspection for asbestos before commencement of a renovation, demolition or maintenance activity does NOT constitute an emergency.*

A copy of the permit regulations may be obtained by contacting EHSS at 231-6775.

4.5 Equipment

All equipment used for O&M work practices or response actions shall be approved for use in asbestos operations. In general, some or all of the following materials and/or equipment may be required for asbestos work:

Respirators: Respiratory protection shall conform to the requirements of OSHA 1910.1001. Respirator selection, use and maintenance shall conform to the requirements of the university's Respiratory Protection Program.

11"x17" Danger Signs: Danger signs shall be posted at each entrance to an asbestos regulated area. Signs shall conform to OSHA 1910.1001.

Barrier Tape: Barrier tape specific to asbestos-related work shall be used to demarcate a regulated area when the work area is not isolated by physical boundaries (e.g walls with lockable doors).

Six mil polyethylene sheeting: Poly is used to construct critical barriers, to protect finishes, and to contain the release of airborne asbestos from the work area. The poly is generally attached using spray glue and duct tape.

HEPA-Filtered Vacuum: Such vacuums, designed to be used with a HEPA filter, are available in various sizes and capacities, and can be used with attachments on drills, saws and other tools.

Wetting Agent: A chemical wetting agent added to water that is used to soak ACM. This amended water penetrates more effectively than normal water, and permits more thorough soaking of the ACM prior to removal or disturbance.

Airless Sprayer: Airless sprayers are used to apply amended water to ACM.

Portable Shower: Portable showers are used in conjunction with a clean and dirty change room for personnel decontamination on larger asbestos projects. A portable shower may be appropriate for some types of SS/SD projects.

Disposable Coveralls: Disposable, impervious coveralls, equipped with head and foot covers, that are used on asbestos projects to prevent gross contamination from contacting the worker.

Asbestos Disposal Bags: 6-mil Polyethylene bags that are pre-printed with the following: "Danger; Contains Asbestos Fibers; Avoid Creating Dust; Cancer and Lung Disease Hazard; Breathing Airborne Asbestos, Tremolite, Anthophyllite or Actinolite Fibers is Hazardous to Your Health"; and "RQ Hazardous Substance; Solid, NOS (ASBESTOS); NA 9188; (ORM-E)". Bags shall, in addition, utilize the hazard label currently required by Virginia Department of Transportation. Bags shall be individually labeled with an adhesive tag which lists the project, site, and name of the group that removed the asbestos.

4.5 Development of SWP's

The departments shall, with the assistance of EHSS, develop SWP's specific to the asbestos-related work that they perform. Copies of these SWP's shall be:

- Made available to EHSS,
- Maintained with the departmental copy of the O&M program, and,
- Provided to supervisors and employees who conduct work covered by the SWP.

Ensuring compliance with the SWP shall be the responsibility of the individual employee, the employees' supervisor, and the department. Deficiencies noted during field inspections and audits conducted by EHSS of work performed shall be brought to the attention of the employee, supervisor or department as appropriate.

Copies of SWP's that are based upon an industry standard, or that were developed with the assistance of various departments, may be found at the end of this section.

Appendix A

GLOSSARY

Abatement	Work that involves the physical removal of asbestos. Work must be performed by trained personnel under the supervision of a competent person as defined by the Environmental Protection Agency (EPA).
Aggressive Final Clearance Air Sampling	The act of aggressively agitating the air in an asbestos removal area using fans and/or a leaf blower while final clearance air samples are being taken.
Amended Water	Water that has been mixed (amended) with a chemical wetting agent, or surfactant, to improve penetration and wetting ability.
Asbestos	A generic name given to a number of naturally occurring minerals that possess a unique crystalline structure and are separable into fibers. Asbestos includes the asbestiform varieties of chrysotile, crocidolite and amosite.
Asbestos-containing Material (ACM)	Any material containing more than 1.0% asbestos by area as determined using Polarized Light Microscopy.
Asbestos Project	An activity involving job set-up for containment, removal, enclosure, encasement, renovation, repair, demolition, construction or alteration of an asbestos-containing material.
CFR	Code of Federal Regulations
Control Measure	A measure used to control the generation of airborne asbestos fibers until a permanent solution can be implemented. These measures include encapsulation, repair, encasement and enclosure.
Delamination	Physical separation of one layer from another.
Encapsulation	The application of a sealant over the surface of the asbestos-containing material to prevent the release of asbestos fibers.

Enclosure	The construction or installation over or around the ACM of any solid or flexible covering, which will not deteriorate or decompose for a period of time, so as to conceal the ACM, contain ACM fibers, and render the ACM inaccessible.
EPA	The United States Environmental Protection Agency
Excursion Limit	The employer shall ensure that no employee is exposed to an airborne asbestos fiber concentration in excess of 1.0 f/cc of air as averaged over a sampling period of thirty (30) minutes; the concentration of 1.0 f/cc is defined as the excursion limit.
Fiber Release Episode	The unintentional disturbance of ACM resulting either from accidental contact or that is a result of other factors, such as pipe leaks or roof leaks, where the ACM has been physically dislodged and the potential for asbestos fibers to have become airborne as a result of this disturbance is high.
Friable	Material which is capable of being crumbled, pulverized or reduced to powder by hand pressure when dry, or which under normal use or maintenance emits or can be expected to emit fibers into the air.
HEPA	High Efficiency Particulate Air (HEPA). HEPA filtered equipment must be capable of trapping and retaining 99.97% of all particles larger than 0.3 microns.
Homogenous	Materials of the same age, physical appearance, texture and color, used for a similar application. A separate homogenous sampling area shall be defined for each type of homogenous material on each floor of a building.
Industrial Hygienist	A professional qualified by education, training and experience to recognize, evaluate, and develop control measures for occupational health hazards.
Miscellaneous ACM	Interior ACM that is not surfacing or thermal system insulation, such as some floor tile, ceiling tile, wire insulation, asbestos cement products and so forth.
Operations & Maintenance Program	Specific procedures and practices developed for the interim control of asbestos-containing materials in buildings until it is removed.

OSHA

Occupational Safety and Health Administration, administered in Virginia by the Department of Labor and Industry (DLI).

Permissible Exposure Limit (PEL)

The highest allowable level of exposure to airborne asbestos fibers that an employee may have, without using respiratory protection, as stated by the Occupational Safety and Health Administration (OSHA).

Personal Protective Equipment

Any material or device worn to protect a worker from exposure to, or contact with, any harmful material or force. PPE should be used only if engineering or administrative controls are insufficient to protect against a hazard.

Regulated Area

An area established by the employer to demarcate areas where airborne asbestos fiber concentrations exceed, or can reasonably be expected to exceed, the permissible exposure limit.

Renovation

Altering, in any way, one or more facility components.

Repair

Returning damaged ACM to an undamaged condition or to an intact state so as to prevent fiber release.

Respiratory Protection

A device worn to either purify the air, or that provides clean air from another source to the wearer. All respirator users must be enrolled in Virginia Tech's Medical Surveillance Program, and must have received appropriate training on respirator use, care, and maintenance.

Response Action

Repair of damage or deterioration to asbestos materials, or the removal of asbestos or asbestos debris, undertaken to alleviate a hazard to building occupants.

For the purposes of this document, in-house workers may only conduct small-scale, short-duration removal or repair response actions, the cleaning/removal of asbestos debris, and cleaning/removal operations associated with an asbestos fiber release episode.

Asbestos work other than small-scale, short duration must be performed by either an in-house person who has Asbestos Worker equivalent training, or by a licensed asbestos removal contractor.

**Small-scale,
Short-duration
Asbestos Projects**

Small-scale, short-duration (SS/SD) renovation and maintenance activities include, but are not limited to: removal of ACM from pipes; replacement of an ACM gasket on a valve; installation or removal of small sections of drywall; installation or electrical conduit proximate to, or through, ACM; or the removal of small sections of ceiling tile, friable (e.g. damaged) flooring, or unbonded ACM flooring where the work is non-repetitive, and can be completed within an eight (8) hour work shift. The purpose of SS/SD projects is maintenance, repair or renovation where the removal of ACM is not the primary goal of the job. For additional information, see Section 4.1.

**Asbestos Project
Supervisor**

A person with the training and experience required by the Department of Commerce for licensing as an Asbestos Supervisor, and who meets the qualifications of "competent person" as established by 40 CFR 761. An asbestos project supervisor must be present on all asbestos projects which involve the removal of friable ACM.

Surfacing ACM

ACM sprayed or troweled on surfaces, such as some acoustical plasters, hard wall or ceiling plasters, and fireproofing.

**Thermal System
Insulation**

Thermal system insulation (TSI), is ACM applied to pipes, fittings, boilers, breaching, tanks, ducts or other structural components to prevent heat loss or gain or water condensation.