Asbestos Management Plan

August 2015

California State University
Long Beach, California 90840
Table of Contents

1. Introduction

2. Asbestos Location on Campus

3. Procedure for Asbestos Abatements on Campus

4. Renovations and Demolitions

5. Inspections, Bulk Sampling, and Analysis

6. Agency Notifications

7. Employee Training

8. Employee Notification

Appendix A—South Coast Air Quality Management District Rule 1403 - Asbestos Emissions from Demolition/Renovation Activities

Appendix B - Asbestos in Buildings Guidance for Service and Maintenance Personnel

Appendix C - Managing Asbestos in Place: A Building Owner’s Guide to Operations and Maintenance Programs for Asbestos Containing Materials

Appendix D—EPA Region 6 Asbestos Containing Materials List
1.0 Introduction

1.1 Overview
This is the Asbestos Management Plan (hereafter referred to as “the Plan”) for California State University Long Beach. This Plan is drafted in compliance with applicable elements of 40CFR, Part 763, Subpart E, 29CFR1926.1101, CCR Title 8, and SCAQMD Regulation 1403. The Plan establishes a method of doing business, including specified procedures and a specific program of operation, that is designed to prevent campus violations of the Federal Clean Air Act, the asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), and specific elements of the California Department of Industrial Relations Occupational Safety and Health Act.

1.2 General Precautions and Procedures

Asbestos can be found in many buildings as a component of building construction materials. Asbestos is a hazardous material which may cause adverse health effects. However, asbestos does not pose a threat to human health unless asbestos fibers become airborne.

Avoid touching asbestos containing materials on walls, ceilings, pipes, or boilers. **Do Not** drill holes, hang plants or other objects form building components made from or which may contain asbestos materials. **Do Not Disturb** asbestos-containing materials when replacing light bulbs. **Do Not Disturb** damaged asbestos-containing materials or asbestos debris. If you find asbestos-containing materials that have been damaged, you must immediately:

- Stop any activities that will generate dust or spread debris.
- Contact Environmental Health and Safety (EHS) at 52283 for direction.
- Contact EHS at 52283 if you or someone else is contaminated.
- Do not attempt to handle or clean up damaged materials unless you are trained to do so, current in your training (training date within the last year), licensed, and authorized to do so.

Only persons who are trained, licensed, and authorized to do so may handle or otherwise disturb any asbestos containing material or suspect asbestos containing material.

The Asbestos Management Plan establishes procedures to be followed by all employees, contractors, and subcontractors to minimize the possibility of exposure to airborne asbestos fibers.
The Plan is one component of the University’s commitment to protect the health and safety of its employees, students, and the general public from asbestos hazards. For more information, contact the following individuals:

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Information</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phil Dostalek or Anthony Malagrinohil</td>
<td>Facilities Management - (562) 985-8886</td>
<td>- Report damage to asbestos containing materials</td>
</tr>
</tbody>
</table>
| Peer Gerber Envity Director, Environmental Health and Safety Facilities Management - (562) 985-8893893 | - Questions regarding asbestos regulations  
- Questions regarding asbestos exposures  
- Questions regarding the location of asbestos containing materials |
1.3 Definitions

Asbestos
means the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthrophyllite, and actinolite-tremolite.

Asbestos Containing Material (ACM)
means any material which contains at least 1% asbestos.

Category I Nonfriable Asbestos Containing Material (ACM)
means asbestos containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1% asbestos.

Category II Nonfriable ACM
means any material excluding Category I nonfriable ACM, containing more than 1 percent asbestos, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Demolition
means the dismantling or removal of any load supporting structural member of a facility together with any related handling operations or the intentional burning of any facility. Structural member means any load-supporting member of a facility, such as beams and load supporting walls; or any non-load supporting member, such as ceilings and non-load supporting walls.

Friable Asbestos Material
means any material containing more than 1 percent asbestos, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

NESHAP

Operations and Maintenance Program
means a program put in place by the university to minimize exposure of all employees to asbestos fibers. To accomplish this objective, an O&M program includes work practices to (1) maintain ACM in good condition, (2) ensure proper cleanup of asbestos fibers previously released, (3) prevent further release of asbestos fibers and (4) monitor the condition of remaining ACM.
1.3 Definitions (continued)

Operations and Maintenance Team
means university employees who are trained to clean up minor fiber release episodes involving non-friable Class I or Class II materials involving less than 10 square feet of miscellaneous material, or to conduct small scale abatements that can be contained within one 36 inch by 60 inch glove bag. This training must be provided by an EPA accredited training provider, and may be either 16 hours (O&M workers) or 40 hours (Asbestos Abatement workers)

Record Retention Period
means the minimum period that records must be maintained as required by the South Coast Air Quality Management District 1403 and NESHAP. All records must be maintained for a minimum of three years.

Regulated Asbestos Containing Material (RACM)
means (a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

Renovation
means altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load supporting structural members are wrecked or taken out are demolitions.

Suspect RACM
means material that has not yet been analyzed by an EPA-accredited laboratory to determine whether it is RACM.
2.0 Location of Asbestos Containing Building Materials

2.0 Location of Asbestos in University Buildings

Asbestos can be found in many common building materials and components. Examples include, but are not limited to:

- pipe insulation
- air duct insulation
- acoustic ceiling
- floor tile
- floor tile mastic
- structural fireproofing
- electrical wiring
- FM rated fire doors
- dry wall finishing compound

Appendix D contains an EPA created listing of additional common building materials which may contain asbestos. As the disclaimer declares, the list is not comprehensive in nature and should not be viewed as complete.

The campus maintains a staff of EPA accredited building inspectors that perform inspections to locate, assess and inventory asbestos containing materials in university buildings. The following list contains all locations currently inspected in campus buildings or equipment where friable and/or non-friable asbestos containing materials are known or suspected.

EHS is responsible for maintaining and updating the list of asbestos containing materials. The list is continuously updated, as material is either discovered or removed. Contact EHS if there are any questions regarding the location of asbestos containing materials or questions as to whether a material contains asbestos.

The annual Notification to Employees of the Presence of Asbestos in University Buildings and the building list can be reviewed on the CSULB website:

http://daf.csulb.edu/offices/ppfm/ehs/programs/asbestos/index.html
3.0 Procedures for Working with Asbestos at CSULB

3.0 Working with asbestos containing materials at CSULB is regulated by Cal-OSHA, federal OSHA, federal EPA, California EPA and the Department of Toxic Substances Control, and the South Coast Air Quality Management District. Strict adherence to all applicable regulations and statutes is mandatory of asbestos related work at CSULB.

3.1 Procedure for campus projects using certified asbestos contractors.

A. A project proposal is generated by Physical Planning, Facilities Management or a campus department using “Self-Help” procedures.

B. A review of existing drawings of the campus property where the project will take place is conducted, suspect asbestos containing materials are identified.

C. A complete survey of the entire project area, including materials outside the project area that may be impacted by the project, is completed by a Certified Asbestos Consultant and a written report on the conditions found is submitted to the project generator (either Physical Planning or Facilities Management). Since building inspection reports require specialized knowledge to comprehend and formulate response actions, departments engaged in self-help projects will simply be notified that asbestos containing materials have or have not been found within the project scope. Appropriate response actions will be directed by Physical Planning.

D. If asbestos containing building materials have been discovered and will be disturbed, or if previously identified asbestos containing building materials will be disturbed by the project, an asbestos abatement using California certified asbestos contractor personnel and a California certified third party industrial hygiene firm will be retained to complete the abatement component using CSULB specifications.

E. Uniform Waste Manifds or bill of lading for non-hazardous nonfriable asbestos containing waste generated by the project are signed by EHS before the waste is shipped to approved disposal facilities and the campus project continues.
3.2 Procedure for campus projects using campus personnel and an Operations and Maintenance team. *(Note: There is currently no O&M Team operated by the university. All asbestos abatements are completed by qualified contractors, with professional oversight contractors inspecting and issuing clearance air reports.)*

A. A project proposal is generated by Physical Planning, Facilities Management or a campus department using “Self-Help” procedures.

B. A review of existing drawings of the campus property where the project will take place is conducted, suspect asbestos containing materials are identified.

C. A complete survey of the entire project area, including materials outside the project area that may be impacted by the project, is completed by a Certified Asbestos and a written report on the conditions found is submitted to the project generator (either Physical Planning or Facilities Management). Since building inspection reports require specialized knowledge to comprehend and formulate response actions, departments engaged in self-help projects will simply be notified that asbestos containing materials have or have not been found within the project scope. Appropriate response actions will be directed by Physical Planning.

*(Note: The following procedure shall be used if the university returns to an “in-house” O&M Team.)*

D. If asbestos containing building materials have been discovered and will be disturbed, or if previously identified asbestos containing building materials will be disturbed by the project, an asbestos abatement using a fully trained campus Operations and Maintenance team may complete the abatement following campus protocols.

1. Campus Operations and Maintenance Protocol

   a. The minimum level of training for campus asbestos abatement shall be “Operations and Maintenance 16 hour training, curriculum as described in 40CFR, Part 763.92.

   b. All asbestos abatement work using campus O and M procedures will be completed using two currently trained employees. Compliance with all agency notification requirements is mandatory.

   c. Campus O and M procedures will be limited to ten (10) square feet of miscellaneous material (vinyl asbestos tile and mastic), or one 36” X 60” glove bag.
d. Any emergencies that result in a NESHAPS major fiber release episode will be addressed by contractor personnel holding qualifications as a California Asbestos Contractor. Emergencies that can be contained within one 36” X 60” glove bag or involve less than 10 square feet of miscellaneous material may be resolved by the CSULB O and M Team.

e. The campus O and M team shall be supervised by an employee trained to the level of “Competent Person, O & M Class III and IV work”, curriculum as described in 40 CFR, Part 763.92 (a)(2).

f. All required notifications, HVAC shutdowns, and third party oversight supervision, inspection and clearance by a Certified Asbestos Consultant will be required for campus O and M projects.

g. If the campus is currently maintaining an employee who is trained and has current certification as a Certified Asbestos Consultant, that person may provide the survey, supervision, monitoring, final inspection and clearance services detailed in (f).

The complete guide—Managing Asbestos in Place: A Building Owner’s Guide to Operations and Maintenance Programs for Asbestos Containing Materials- can be found in Appendix C.
3.3 Regulations Regarding Operations and Maintenance Training

Environmental Protection Agency
§ 763.92 Training and periodic surveillance.

(a) Training. (1) The local education agency shall ensure, prior to the implementation of the O&M provisions of the management plan, that all members of its maintenance and custodial staff (custodians, electricians, heating/air conditioning engineers, plumbers, etc.) who may work in a building that contains ACBM receive awareness training of at least 2 hours, whether or not they are required to work with ACBM. New custodial and maintenance employees shall be trained within 60 days after commencement of employment. Training shall include, but not be limited to:

(i) Information regarding asbestos and its various uses and forms.
(ii) Information on the health effects associated with asbestos exposure.
(iii) Locations of ACBM identified throughout each school building in which they work.
(iv) Recognition of damage, deterioration, and delamination of ACBM.
(v) Name and telephone number of the person designated to carry out general local education agency responsibilities under § 763.84 and the availability and location of the management plan.

(2) The local education agency shall ensure that all members of its maintenance and custodial staff who conduct any activities that will result in the disturbance of ACBM shall receive training described in paragraph (a)(1) of this section and 14 hours of additional training. Additional training shall include, but not be limited to:

(i) Descriptions of the proper methods of handling ACBM.
(iii) The provisions of this section and § 763.91, Appendices A, C, and D of this subpart E of this part, EPA regulations contained in 40 CFR part 763, subpart G, and in 40 CFR part 61, subpart M, and OSHA regulations contained in 29 CFR 1926.58.
(iv) Hands-on training in the use of respiratory protection, other personal protection measures, and good work practices.

(3) Local education agency maintenance and custodial staff who have attended EPA-approved asbestos training or received equivalent training for O&M and periodic surveillance activities involving asbestos shall be considered trained for the purposes of this section.
4.0 Renovations and Demolitions

All renovations and demolitions to campus buildings, leased buildings where university employees are assigned, and properties that come under the beneficial control of the university will comply with South Coast Air Quality Management District Rule 1403, federal EPA NESHAP for asbestos, and California Code of Regulations, Title 8, Articles 2.5, 2.6 and 2.7, section 5208, and section 1529. This standard, in substance, requires:

1. A thorough inspection and quantification of asbestos containing materials by a Certified Asbestos Consultant prior to any renovation or demolition activity.
2. Notification to SCAQMD of any demolition operation, whether asbestos is present or not.
3. Notification to SCAQMD of renovation operations if asbestos is present in quantities greater than 100 square feet.
4. Notification to Cal/OSHA of renovation and/or demolition operations if asbestos is present in quantities greater than 100 square feet.
5. Training of campus employees performing inspections, supervision, and abatement.
6. The presence of a competent person, holding a valid Contractor/Supervisor course certificate, during all phases of all demolition and/or renovation activities.
7. Removal of asbestos prior to renovation and/or demolition activities that disturb asbestos or preclude access to asbestos.
8. Specific work practices to be used during demolition and renovation operations involving asbestos materials.
9. Specific procedures to be followed for asbestos waste disposal, including labeling, transportation, and recordkeeping requirements.

Prior to the commencement of any demolition or renovation, a diligent and complete inspection shall be performed, by a Certified Asbestos Consultant, of the facility for the presence of RACM and suspect RACM. No activity will begin that might disturb or preclude access to any RACM or suspect RACM, including any activity that might disturb or preclude access to any RACM or suspect RACM in any adjacent structure, mechanical system, building or room not directly involved in the demolition or renovation until:

1. The results of laboratory analyses conducted by a NIST or EPA-accredited laboratory are available establishing that the suspect RACM is, in fact non-RACM or
2. All RACM or suspect RACM has been completely removed from the facility in accordance with all applicable laws and regulations.
4.0 Renovations and Demolitions (continued)

If any suspect RACM is discovered at a demolition or renovation activity, this material may be treated as RACM without sampling and analysis. However, before suspect RACM may be treated or handled as non-RACM, samples of the suspect RACM must be appropriately collected and analyzed. The only assumption that can be made regarding RACM is affirmative – analysis must be used to prove that suspect RACM is non-RACM.

If a department contemplating renovation or demolition of university facilities or equipment believes that a specific material, utilized throughout the facility as a homogenous material, does not contain asbestos, and that specific material has been designated as PACM by an accredited AHERA/ASHARA Building Inspector, Certified Asbestos Consultant, or Certified Industrial Hygienist, the department may rebut the finding that such a material is PACM by selecting one of the following options:

1. Having a completed inspection conducted pursuant to the requirements of AHERA (40 CFR 763, Subpart E) which demonstrates that no ACM is present in the material; or
2. Performing tests of the material containing PACM which demonstrate that no ACM is present in the material. Such tests shall include analysis of bulk samples in the manner described in 40 CFR 763.86. The tests, evaluation and sample collection shall be conducted by an accredited inspector or by a Certified Industrial Hygienist (CIH). Analysis of samples shall be performed by persons or laboratories with proficiency demonstrated by current successful participation in a nationally recognized testing program such as the National Voluntary Laboratory Accreditation Program (NVLAP) or the National Institute for Standards and Technology (NIST) or the Round Robin for bulk samples administered by the American Industrial Hygiene Association (AIHA) or an equivalent nationally recognized round robin testing program.

The requesting department shall fully fund the costs of such requested rebuttal testing.

If any RACM or suspect RACM is discovered at a demolition or renovation operation that is already underway, work will immediately cease that could disturb or preclude access to the RACM or suspect RACM. Work activities shall not resume that might disturb or preclude access to the RACM or suspect RACM until the discovered material has been appropriately sampled, analyzed, and, if found to be RACM, removed by trained asbestos abatement personnel.
5.0 Inspection, Bulk Sampling, and Analysis

5.1 Inspections

Inspections will only be conducted by a person who has successfully completed the asbestos inspection curriculum specified in the Training Section. If a trained CSULB inspector is not available, the campus will arrange for the services of an inspector trained in accordance with EPA/AHERA Building Inspector requirements.

All inspections will be documented in a report detailing procedures used to identify RACM and suspect RACM. All inspections will include a review of original blueprints and specifications of the facility when those documents are available. The inspection will identify and quantify all friable, Class I and Class II non-friable ACM. A visual inspection will be performed of all areas of the facility with which any person involved in the demolition or renovation operation may come into contact, or which may contain asbestos and could be affected directly or indirectly by the operation. In conducting the inspections, each inspector will:

- Visually inspect the area to identify the location of all suspect RACM not previously sampled;
- Touch all suspect RACM not previously identified to determine if it is friable;
- Identify all friable suspect RACM and all non-friable suspect RACM that was not previously identified; and
- Collect bulk samples of suspect RACM not assumed to contain asbestos and suspect RACM not previously sampled. Bulk sampling will be conducted in accordance with current best practices for bulk sample collection.

An area of homogeneous material may be considered to be RACM without analyzing any remaining samples if one bulk sample analysis shows more than 1% asbestos. If all samples required to be collected are found by an EPA-accredited laboratory not to contain more than 1% asbestos, then the area of homogeneous material may be treated as non-RACM.

5.2 Sampling

Asbestos bulk samples will be collected only by a person who has completed the asbestos inspection training specified in the Training Section. All asbestos bulk samples will be collected in a random manner, using the grid system described in EPA publication number 560/5-85-030a, “Asbestos in Buildings – Simplified Sampling Scheme for Friable Surfacing Materials [EPA “Pink” Book]. The sampling protocol recommended in that publication is available for review at the EHS office.
5.0 Inspection, Bulk Sampling, and Analysis

8. SAMPLE COLLECTION

Collect samples while the area is unoccupied. The following guidelines for sample collection are designed to minimize damage to the ACM and subsequent fiber release.

- Wear at least a half-face respirator with disposable P100 filters.

- Wet the surface of the material to be sampled with water mist from a spray bottle or place a plastic bag around the sampler with the open end of the bag pressed tightly against the wall or ceiling.

- Sample with a reusable sampler such as a cork borer or a single-use sampler such as a glass vial, or metal or plastic container.

- With a twisting motion, slowly push the sampler into the material. Be sure to penetrate any paint or protective coating and all the layers of the friable material.

- For reusable samplers, extract and eject the sample into a container. Wet-wipe the tube and plunger. For single-use samplers, extract, wet-wipe the exterior, and cap it.

- Label the container with the unique sample ID number that is marked on the Sampling Area diagram.

- Clean debris using wet towels and discard them in a plastic bag.

- Use latex spray paint, or a sealant, to cover the spot where the sample was taken.
5.0 Inspection, Bulk Sampling, and Analysis

The number of asbestos bulk samples collected will be based on the extent of homogeneous area according to the following schedule:

3 samples minimum – If the area of the homogeneous suspect RACM is less than 1000 linear feet or 1,000 square feet, at least three (3) bulk samples will be collected from each area.

5 samples minimum – If the area of the homogeneous suspect RACM is at least 1000 linear feet or 1,000 square feet but less than 5,000 square feet, at least five (5) bulk samples will be collected from each area.

7 samples minimum - If the area of the homogeneous suspect RACM is at least 5000 linear feet or 5,000 square feet at least seven (7) bulk samples will be collected from each area.

All asbestos bulk samples will be made up of a core that has fully penetrated the suspect RACM. Each sample collected will be immediately placed in a sealed leak-tight container. The sample container will be labeled with the following information:
5.0 Inspection, Bulk Sampling, and Analysis

Procedures for Documentation of Inspection Findings

1. An inspection report shall be produced with the dates of the inspection and the name, address, telephone number and signature of each person making the inspection.
2. A written statement that the inspectors have successfully completed the required asbestos inspector training course.
3. An inventory and graphic description of the demolition or renovation operation, showing the locations of the area of homogeneous material where samples were collected, the exact location where each bulk sample was collected, the dates samples were collected, the areas of homogenous material where friable samples were collected, the areas of homogeneous materials where non-friable suspect RACM was assumed to be RACM and was therefore not sampled, and the areas where samples taken were determined by an EPA-accredited laboratory to be RACM.
4. A description of the manner used to determine sampling location and a description of sampling protocols.
5. A list of the type of materials that make up each area of homogeneous material (e.g. surfacing, thermal systems insulation, miscellaneous).
6. Chain of custody forms identifying each sample taken.
7. The name, address and telephone number of any laboratory which conducted analyses.
8. A statement of qualification of the laboratory demonstrating its current NIST-accreditation.
9. Laboratory reports for each asbestos bulk sample of RACM and suspect RACM taken at the demolition or renovation operation, including a list of test methods used, test data, and any other information used to identify or quantify any materials containing asbestos.

5.3 Laboratory Analysis

If the asbestos content is less than 10% as determined by polarized light microscopy (PLM) the asbestos content must also be verified by using the PLM point counting method.

Samples will be analyzed only by an EPA-accredited or NIST-accredited laboratory. An EPA-accredited laboratory means a laboratory with current accreditation to conduct bulk analysis pursuant to EPA’s Interim Asbestos Bulk Sample Analysis Quality Assurance Program.

A NIST-accredited laboratory has a current accreditation to conduct asbestos bulk sample analysis from the National Institutes of Science and Technology (NIST), pursuant to the National Voluntary Laboratory Accreditation Program.
6.0 Agency Notifications

6.1 Notification Responsibilities

All work involving the disturbance or potential disturbance of ACM on the campus will be engaged and completed by contractors. Contractors retained by the university to completed asbestos related projects must be appropriately licensed by the state of California, carry and be able to demonstrate that they carry appropriate types and amounts of insurance, as required by the CSU system, and provide work crews with current training and medical documents. As stipulated in SCAQMD, Reg. 1403, these contractors are responsible for filing the appropriate notifications with the appropriate agencies. EHS will assist the office of Construction Management in ensuring that copies of the completed form (AQMD REV200610) are filed with the appropriate agency. Copies of the notification form can be accessed at the SCAQMD website as follows:


Copies of the appropriate notifications will be maintained by Construction Management in the project file for the required records retention period.

6.2 South Coast AQMD Notification

South Coast AQMD Rule 1403 specifies notification requirements. A copy of this rule is included in Appendix A. The Agency must be notified as follows:

1. Annual notification is required if nonscheduled renovation operations conducted during the year are expected to exceed 100 square feet. This notification is due by December 17 of the year preceding the year in which notification is given. *(CSULB does not maintain an Operations and Maintenance Team. Any work which may require the disturbance of ACM, ACBM, RACM or suspect RACM is directed to an appropriately licensed contractor. Scheduled renovations and demolitions are designed according to current facility surveys, and any asbestos related work is directed to licensed contractors. The Annual Notification requirement will be followed if the university reinstates the Operations and Maintenance Team.)*

2. Renovation notification is required if more than 100 square feet of asbestos will be removed. The notification must be postmarked at least 10 working days prior to the start of demolition activities.

3. Demolition notification is always required, **even if there is less than 100 square feet of asbestos that will be disturbed.** *(Refer to the definition of demolition in section 1.3) The notification must be postmarked at least 10 working days prior to the start of demolition activities.*

Notification must be typewritten on forms provided by South Coast AQMD. A copy of the notification form follows this section. A filing fee must accompany the notification. Consult the AQMD website for current fee schedules, which are amended frequently. The fee schedule is posted in AQMD Rule 301. Send the notification to:

South Coast AQMD
Air Toxics Branch
21865 East Copely Drive
Diamond Bar, Ca. 91765-4182
Telephone: (909) 396-2336
6.0 Agency Notifications

Notifications must be revised if the quantity of asbestos changes by 20% or more, the start date changes, or the complete date changes.

6.3 Federal EPA Notification

Federal EPA does not require notification if the South Coast AQMD has been notified.

6.4 Cal/OSHA Notification

California Code of Regulation, Title 8, section 5203 specifies notification requirement. Two types of notifications apply to the campus:

- Carcinogen Report of Use
- Temporary Worksite (Abatement) Notification

The Carcinogen Report of Use applies to exposures of campus employees to listed Cal/OSHA carcinogens. Employee exposure to asbestos must be included in the Carcinogen Report of Use. The Temporary Worksite Notification applies to asbestos abatements.

The Carcinogen Report of Use form is a general notification to Cal/OSHA and applies to campus employees. This form does not apply to temporary worksite abatement operations. This form is filed one time, but must be updated within 15 days of any information changes. Cal/OSHA can also periodically request the campus to verify the information listed on the current submitted form. The Carcinogen Report of Use Form is sent to the Chief of the Division of Occupational Safety and Health, PO Box 603, San Francisco, Ca. 94101. A copy of the Carcinogen Report of Use Form follows this section. There is no notification fee.

A Temporary Worksite Notification must be made for abatement jobs if more than 100 square feet of asbestos will be disturbed. The notification applies to the employees of the contractor performing the work. Notification must be made at least 24 hours in advance of the job. There is no notification fee. The notification can be made by using the SCAQMD Notification Form, or other means that include the time and date of the commencement of work, approximate duration of work, location, type of business, and kind of work to be performed. Notification can be made by mail, phone, or fax to the Cal/OSHA District Office:

Department of Industrial Relations
Division of Occupational Safety and Health
680 Knox Street, Suite 100
Torrance, Calif. 90502
Telephone (310) 516-3734

Copies of the referenced SCAQMD and Cal/OSHA notification forms follow. Verify that these forms are current (consult the SCAQMD website) prior to use.
7.0 Employee Training

7.1 Training Requirements

Any employee engaged in the removal of RACM during demolition or renovation operations, or in the inspection of a facility for the presence of RACM or suspect RACM, will be properly trained. Copies of training certificates for each trained employee will be maintained in this Plan for the records retention period.

The campus will maintain at least two employees who have successfully completed an EPA-approved 3-day Building Inspector course of study, and at least two employees who have successfully completed a four or five day Contractor/Supervisor/Competent Person course. These same employees can be trained as both Building Inspector/Contractor/Supervisor/Competent Person. Each employee selected will attend an EPA-approved refresher training course before the current certificate expires. If training certificates expire, those employees who cannot show current proof of training shall not be assigned duties that include working with, sampling for, or inspecting building components that may contain asbestos.

No one will be deemed to have “successfully completed” the training required until he or she has passed the test given by the EPA-approved training provider for the relevant course of study or training program.

Pursuant to 40 CFR 763, Subpart G 763.120-123, 29 CFR 1910.1001 (j) (7) (iv) and CCR Title 8, sec. 5208 (j) (7) (D) custodial employees whose assigned duties may bring them into areas where ACM or PACM may be installed shall be provided with an awareness level training, 2 hours in length and an annual refresher training.

7.2 Inspector Training

Any person engaged in the inspection of a facility for RACM or suspect RACM will have successfully completed an EPA-approved 3-day Building Inspector course of study. The course material will contain, but not be limited to:

- Federal, state, and local laws and regulations governing asbestos removal, notification, handling, transport and disposal requirements.
- Practices and procedures for detection and sampling of asbestos, control of asbestos fiber releases, worker protection, and equipment decontamination.
- Health effects of asbestos exposure.

7.3 Contractor/Supervisor/Competent Person Training

Any person engaged to perform maintenance, renovation, asbestos stripping, removal, handling, clean-up, air monitoring, transportation, or disposal activities, including maintenance personnel who can reasonably be expected to come into contact with RACM or suspect RACM during their normal duties, will have successfully completed a four or five day EPA-approved training course for asbestos abatement workers. The course material will include, but not be limited to:
7.0 Employee Training

- Legal liabilities
- Work practice procedures
- The role of inspectors, hygienists, and other asbestos experts.
- Federal, state, and local laws and regulations governing asbestos removal, notification, handling, transport, and disposal.
- Worker and occupant safety issues.
- Clean up and disposal of RACM
- Personal protective equipment
- Safety considerations
- Health effects of asbestos exposure

California State University Long Beach
Trained Employee List

AHERA/ASHARA EPA Building Inspectors

George Alfaro-- Environmental Compliance Specialist  Envi  (562) 985-2378
Environmental, Health and Safety

Michael Kitahara- Occupational Safety and Environmental Specialist  (562) 985-1761
Environmental, Health and Safety

AHERA/ASHARA EPA Contractor/Supervisor/Competent Person

George Alfaro-- Environmental Compliance Specialist  (562) 985-2378
Environmental, Health and Safety

Michael Kitahara- Occupational Safety and Environmental Specialist  (562) 985-1761
Environmental, Health and Safety
7.0 Employee Training

7.4 Custodial Awareness Training

Custodians and other housekeeping employees whose assigned duties may bring them into areas where ACM, RACM or PACM is installed, shall be provided with an awareness level training. The content of this training shall be, at a minimum, the following:

- health effects of asbestos
- locations of ACM and PACM in the building/facility
- recognition of ACM and PACM damage and deterioration
- requirements in this standard relating to housekeeping
- proper response to fiber release episodes

Custodial and housekeeping employees shall have a refresher training at least annually. This refresher training will take the form of a distributed written training document, with a signed affirmation by the employee that they have received, read, and understood the training document.

Copies of these affirmation responses shall be maintained by EHS EHS for the records retention period.
8.0 Employee Notification

8.1 The Director, Environmental Health & Safety, is responsible for required employee notifications and will maintain records of employee notifications for the record retention period.

Employees will be provided with an asbestos notification according to the following schedule:

- Within 30 days of being hired or within 15 days of commencement of work in a building containing asbestos, which ever occurs first.
- Within 15 days of the close of each calendar quarter if new asbestos information was developed during the quarter.
- Annually.

Since this data is maintained electronically and is updated whenever new information is received regarding the location and condition of asbestos, compliance with the above schedule is considered complete.

Notwithstanding the above schedule, the university shall post the current Notification Letter to Employees of the Presence of Asbestos in University Buildings, and the attendant listing of those locations annually, on the following website:

http://daf.csulb.edu/offices/ppfm/ehs/programs/asbestos/index.html

The notification must inform the employee of:

- The information specified in Health and Safety Code section 25915.
- What an employee must do if that employee discovers RACM or suspect RACM while working at a facility, including a description of safety measures that employees can take in the event of site or personal contamination.
- The fact that asbestos is a hazardous material which can cause adverse health effects.
- The specific direction not to handle, move, or otherwise disturb any RACM or suspect RACM unless they are specially trained, licensed, and authorized to do so.

A copy of the EPA publication “Asbestos in Buildings, Guidance for Service and Maintenance Personnel” will be given to all employees who may be involved in demolition or renovation work, including all maintenance personnel and custodial staff. A copy of this publication is included in Appendix B.
Appendix A
SCAQMD Rule 1403
Asbestos Emissions from Renovation/
Demolition Activities
RULE 1403.  ASBESTOS EMISSIONS FROM DEMOLITION/RENOVATION ACTIVITIES

(a) Purpose
The purpose of this rule is to specify work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials (ACM). The requirements for demolition and renovation activities include asbestos surveying, notification, ACM removal procedures and time schedules, ACM handling and clean-up procedures, and storage, disposal, and landfilling requirements for asbestos-containing waste materials (ACWM). All operators are required to maintain records, including waste shipment records, and are required to use appropriate warning labels, signs, and markings.

(b) Applicability
This rule, in whole or in part, is applicable to owners and operators of any demolition or renovation activity, and the associated disturbance of asbestos-containing material, any asbestos storage facility, or any active waste disposal site.

(c) Definitions
For the purpose of this rule, the following definitions shall apply:

(1) ACTIVE WASTE DISPOSAL SITE is any disposal site that receives, or has received or processed ACWM within the preceding 365 calendar days.

(2) ADEQUATELY WET is the condition of being sufficiently mixed or penetrated with amended water to prevent the release of particulates or visible emissions. The process by which an adequately wet condition is achieved is by using a dispenser or water hose with a nozzle that permits the use of a fine, low-pressure spray or mist.

(3) AMENDED WATER is water to which a chemical wetting agent or surfactant has been added to improve penetration into ACM.

(4) ASBESTOS is the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, actinolite or tremolite.
(5) ASBESTOS-CONTAINING MATERIAL (ACM) is both friable asbestos-containing material or Class I nonfriable asbestos-containing material.

(6) ASBESTOS-CONTAINING WASTE MATERIAL (ACWM) is any waste that contains commercial asbestos and that is generated by a source subject to the provisions of this rule. ACWM includes, but is not limited to, ACM which is friable, has become friable, or has a high probability of becoming friable, or has been subjected to sanding, grinding, cutting, or abrading, and the waste generated from its disturbance, such as asbestos waste from control devices, particulate asbestos material, asbestos slurries, bags or containers that previously contained asbestos, used asbestos-contaminated plastic sheeting and clothing, and clean-up equipment waste, such as cloth rags or mop heads.

(7) ASBESTOS HAZARD EMERGENCY RESPONSE ACT (AHERA) is the act which legislates asbestos-related requirements for schools (40 CFR 763, Subpart E).

(8) ASSOCIATED DISTURBANCE of ACM or Class II nonfriable ACM is any crumbling or pulverizing of ACM or Class II nonfriable ACM, or generation of uncontrolled visible debris from ACM or Class II nonfriable ACM.

(9) CLASS I NONFRIABLE ASBESTOS-CONTAINING MATERIAL is material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), and that, when dry, can be broken, crumbled, pulverized, or reduced to powder in the course of demolition or renovation activities. Actions which may cause material to be broken, crumbled, pulverized, or reduced to powder include physical wear and disturbance by mechanical force, such as, but not limited to, sanding, sandblasting, cutting or abrading, improper handling or removal or leaching of matrix binders. Class I nonfriable asbestos-containing material includes, but is not limited to, fractured or crushed asbestos cement products, transite materials, mastic, roofing felts, roofing tiles, cement water pipes and resilient floor covering.

(10) CLASS II NONFRIABLE ASBESTOS-CONTAINING MATERIAL is all other material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), that is neither friable nor Class I nonfriable.
(11) COMMERCIAL ASBESTOS is any material containing asbestos that is extracted from asbestos ore.

(12) CUTTING is penetrating with a sharp-edged instrument and includes sawing, but does not include shearing, slicing, or punching.

(13) DEMOLITION is the wrecking or taking out of any load-supporting structural member of a facility and related handling operations or the intentional burning of any facility.

(14) EMERGENCY DEMOLITION is a demolition ordered by a governmental agency for the purpose of eliminating peril to the safety of persons, property or the environment resulting from hazards such as collapse, fire, crime, disease, or toxic contamination or other hazard as determined by the Executive Officer.

(15) EMERGENCY RENOVATION is any renovation that was not planned and results from a sudden unexpected event that results in unsafe conditions. Such events include, but are not limited to, renovations necessitated by non-routine failures of equipment, earthquake or fire damage. An economic burden alone, without a sudden, unexpected event, does not give rise to conditions that meet this definition.

(16) ENCAPSULATION is the treatment of ACM with a material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers, as the encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

(17) ENCLOSED STORAGE AREA means a storage room, drum, roll-off container, other hard-sided container, or fenced area that is designed to be securely closed with a lock.

(18) FACILITY is any institutional, commercial, public, industrial or residential structure, installation, building; any ship; and any active waste disposal site. A facility is subject to this rule regardless of its current use or function. For example, a facility destroyed by fire, explosion, or natural disaster, including any debris, remains subject to this rule’s provisions.

(19) FACILITY COMPONENT is any part of a facility including foundations and or utility/commodity pipelines; and equipment such as but not limited to heaters, boilers, HVAC, and motors.
(20) **FRIABLE ASBESTOS-CONTAINING MATERIAL** is material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

(21) **GLOVEBAG** is a sealed compartment with attached inner gloves used for handling ACM. When properly installed and used, glove bags provide a small work area enclosure used for small-scale asbestos stripping operations. Information on glovebag installation, equipment, and supplies, and work practices is contained in the Occupational Safety and Health Administration's final rule on occupational exposure to asbestos (Appendix G to 29 CFR 1926.1101(g)).

(22) **HIGH EFFICIENCY PARTICULATE AIR (HEPA) FILTER** is a filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometer in diameter or larger.

(23) **INSTALLATION** is any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under central control).

(24) **ISOLATED WORK AREA** is the immediate enclosed containment area in which the asbestos abatement activity takes place.

(25) **LEAK-TIGHT** is the condition whereby any contained solids or liquids are prevented from escaping or spilling out.

(26) **LOCKED** means rendered securely closed and able to be opened only with a key or access code.

(27) **NONSCHEDULED RENOVATION OPERATION** is a renovation operation necessitated by the routine failure of equipment, which is expected to occur within a given calendar year based on past operating experience, but for which an exact date cannot be predicted.

(28) **OUTSIDE AIR** is air outside of the facility or outside of the isolated work area.

(29) **OWNER or OPERATOR OF A DEMOLITION OR RENOVATION ACTIVITY** is any person who owns, leases, operates, controls or supervises activities at the facility being demolished or renovated; the demolition or renovation operation; or both.

(30) **PERSON** is any individual, firm, association, organization, partnership, business, trust, corporation, company, contractor, supplier, installer, user
or owner, or any state or local government agency or public district or any
other officer or employee thereof. PERSON also means the United States
or its agencies to the extent authorized by Federal law.

(31) PLANNED RENOVATION is a renovation operation, or a number of
such operations, in which the amount of ACM that will be removed or
stripped within a given period of time can be predicted. Individual
nonscheduled renovation operations are included if a number of such
operations can be predicted to occur during a given period of time based
on operating experience.

(32) PROJECT is any renovation or demolition activity, including site
preparation and clean-up activity.

(33) REMOVAL is the taking out of ACM or facility components that contain
or are covered with ACM from any facility.

(34) RENOVATION is the altering of a facility or the removing or stripping of
one or more facility components in any way, including, but not limited to,
the stripping or removal of ACM from facility components, retrofitting for
fire protection, and the installation or removal of heating, ventilation, air
conditioning (HVAC) systems. Activity involving the wrecking or taking
out of load-supporting structural members are demolitions.

(35) RESIDENTIAL SINGLE UNIT DWELLING is a structure that contains
only one residential unit. Apartment buildings, townhouses, and
condominiums are not residential single unit dwellings.

(36) RESILIENT FLOOR COVERING is asbestos-containing floor tile,
including asphalt and vinyl floor tile, and sheet vinyl floor covering
containing more than one percent (1%) asbestos as determined by
paragraph (h)(2).

(37) STRIPPING is the taking off of ACM from any part of a facility or facility
component.

(38) STRUCTURAL MEMBER is any load-supporting member of a facility,
such as beams and load-supporting walls; or any nonload-supporting
member, such as ceilings and nonload-supporting walls.

(39) WASTE GENERATOR is any person who owns or operates a source
subject to the provisions of this rule according to subdivision (b), and
whose act or process produces ACWM.

(40) WASTE SHIPMENT RECORD is the shipping document, required to be
originated and signed by the waste generator, used to track and
substantiate the disposition of ACWM as specified by the provisions of subdivision (f).

(41) WORKING DAY is Monday through Friday and includes holidays that fall on any of the days Monday through Friday.

(d) Requirements

A person subject to this rule shall prevent emissions of asbestos to the outside air by complying with the following requirements:

(1) Demolition and Renovation Activities

The owner or operator of any demolition or renovation activity shall comply with the following requirements:

(A) Facility Survey

(i) The affected facility or facility components shall be thoroughly surveyed for the presence of asbestos prior to any demolition or renovation activity. The survey shall include the inspection, identification, and quantification of all friable, and Class I and Class II non-friable asbestos-containing material, and any physical sampling of materials.

(ii) A thorough survey shall include, at a minimum, identification of all affected materials at the facility, including but not limited to all layers of flooring materials to the joist level, and all material in the wall or ceiling cavities as necessary to identify and sample them.

(iii) The survey shall be documented with the following information:

(I) The name, address, and telephone number of the person who conducted the survey;

(II) A written statement of the qualifications of the person who conducted the survey, demonstrating compliance with clause (d)(1)(A)(iv);

(III) The dates the survey was conducted;

(IV) A listing of all suspected materials containing any asbestos, a listing of all samples collected, and a sketch of where the samples were taken;
Rule 1403 (Cont.)

(V) The name, address, and telephone number of any laboratory used to conduct analyses of materials for asbestos content;

(VI) A statement of qualification of the laboratory which conducted the analyses, demonstrating compliance with paragraph (h)(2);

(VII) A list of the test methods used, demonstrating compliance with subdivision (h), including sampling protocols and laboratory methods of analysis, test data, and any other information used to identify or quantify any materials containing asbestos; and

(VIII) A general description of the condition of the facility, including but not limited to a description of any obvious fire or structural damage.

(iv) Persons conducting asbestos surveys in accordance with subparagraph (d)(1)(A) shall be certified by Cal/OSHA pursuant to regulations required by subdivision (b) of Section 9021.5 of the Labor Code, and shall have taken and passed an EPA-approved Building Inspector Course and conform to the procedures outlined in the Course.

(B) Notification
The District shall be notified of the intent to conduct any demolition or renovation activity. Notifications shall be submitted in a District-approved format which may include but not be limited to U.S. mail, telephone, facsimile, digital, internet, and e-mail. Telephone, facsimile, digital, and e-mail notifications shall be confirmed with follow-up written notifications to the District postmarked or delivered to the District within 48 hours from submitting the telephone, facsimile, digital, or e-mail notification. No notification shall be considered received unless it is accompanied by the required fee pursuant to Rule 301, as part of the required written notification. Notifications shall be provided in accordance with the following requirements:

(i) Time Schedule
   (I) Demolition or Renovation Activities
The notification shall be submitted to the District no later than 10 working days before any demolition or renovation activities other than emergency demolition, emergency renovation, or planned renovations involving individual nonscheduled renovation operations begin.

(II) Planned Renovation - Annual Notification
The District shall be notified by December 17 of the year preceding the calendar year for which notice is being given for planned renovation activities which involve individual nonscheduled renovation operations.

(III) Emergency Demolition or Renovation
The District shall be notified as soon as possible, but prior to any emergency demolition or renovation activity.

(ii) Notification Required Information
All notifications shall include the following information:

(I) An indication of whether the notice is the original or a revised notification;

(II) Name, address and telephone number of both the owner and operator of the facility, supervising person, and the asbestos removal contractor, owner or operator;

(III) Address and location of the facility to be demolished or renovated and the type of operation: demolition or renovation;

(IV) Description of the facility or affected part of the facility to be demolished or renovated including the size (square meters or square feet and number of floors), age, and present or prior uses of the facility;

(V) The specific location of each renovation or demolition at the facility and a description of the facility components or structural members contributing to the ACM to be removed or stripped from the facility;
(VI) Scheduled project starting and completion dates of demolition or renovation. Notifications shall also include the ACM removal starting and completion dates for demolition or renovation; planned renovation activities involving individual nonscheduled renovation operations need only include the beginning and ending dates of the report period as described in subclause (d)(I)(B)(i)(II);

(VII) Brief description of work practices and engineering controls to be used to comply with this rule, including asbestos removal and waste handling emission control procedures;

(VIII) A separate estimate for each of the amounts of friable, Class I, and Class II nonfriable asbestos-containing material to be removed from the facility in terms of length of pipe in linear feet, surface area in square feet on other facility components, or volume in cubic feet if off the facility components. The total as equivalent surface area in square feet shall also be reported;

(IX) Name and location of waste disposal site where ACWM will be deposited.

(X) Description of steps to be followed in the event that unexpected ACM is found or Class II nonfriable asbestos-containing material becomes crumbled, pulverized, or reduced to powder;

(XI) California State Contractors License Certification number;

(XII) Cal/OSHA Registration number;

(XIII) Name and location address of off-site storage area for ACWM;

(XIV) Name, address, and telephone number of transporters used to transport ACWM off-site;

(XV) Procedures, including analytical methods, used to detect the presence of friable and nonfriable asbestos-containing material; and
(XVI) Signed certification that at least one person trained as required in subparagraph (d)(1)(G) will supervise the stripping and removal described by this notification.

(iii) Emergency Demolition Additional Information

Notification of all emergency demolition activities shall include the following additional information:

(I) The agency, name, title, telephone number and authority of the representative who ordered the emergency demolition; and

(II) A copy of the order, and the date on which the demolition was ordered to begin.

(iv) Emergency Renovation Additional Information

Notification of all emergency renovation activities shall include the following additional information:

(I) The name and phone number of the responsible manager or authorized person who is in charge of the emergency renovation;

(II) The date and hour that the emergency occurred;

(III) A description of the sudden, unexpected event;

(IV) An explanation of how the event caused an unsafe condition, or would cause equipment damage or an unreasonable financial burden; and

(V) A signed letter from the person directly affected by the emergency, such as the property owner or property manager, attesting to the circumstances of the emergency.

(v) Notification Updates

All notifications shall be updated when any of the following conditions arise:

(I) Change in Quantity of Asbestos

A change in the quantity of affected asbestos of 20 percent or more from the notified amount shall be reported to the District as soon as the information becomes available, but not later than the project end
date, unless otherwise specified in an approved Procedure 5.

(II) Later Starting Date
A delay in the starting date of any demolition or renovation activity shall be reported to the District as soon as the information becomes available, but no later than the original start date.

(III) Earlier Starting Date
A change in the starting date of any demolition or renovation activity to an earlier starting date shall be reported to the District no later than 10 working days before any demolition or renovation activities begin.

(IV) Completion Date Change
Changes in the completion date shall be reported to the District at least 2 calendar days before the original scheduled completion date. In the event renovations or demolitions are not completed, are delayed or are completed ahead of schedule, the District shall be notified as soon as possible, but no later than the following business day.

(V) Planned Renovation Progress Report
Notifications for on-going planned renovation operations in which the scheduled starting and completions dates are more than 1 year apart shall be updated, every year of the operation by December 17, unless the most recent written notification update was postmarked or delivered after October 1 of that year and include the amount of ACM removed and the amount of ACM remaining to be removed.

(C) Asbestos Removal Schedule
Material containing asbestos shall be removed from a facility according to the following schedule:

(i) Burning Demolitions
All ACM and Class II asbestos-containing material shall be removed from a facility prior to any demolition by intentional burning. All demolition by intentional burning shall be performed in accordance with Rule 444 – Open Burning.

(ii) Renovations and Non-Burning Demolitions

(I) All ACM shall be removed from a facility being demolished or renovated before any non-burning demolition or renovation activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal.

(II) ACM not accessible for testing or not discovered until after the renovation or demolition activities begin may be removed after the start of the renovation or non-burning demolition activities, pursuant to the appropriate procedure in subparagraph (d)(1)(D).

(III) Notwithstanding the above, asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products which are not friable and are not crumbled, cut, abraded, or otherwise not damaged and in good condition, may be removed after the start of renovation or non-burning demolition activities if prior approval from the District is obtained (Procedure 5).

(IV) If the renovation or demolition activity involves any mechanical force such as, but not limited to, sanding, sandblasting, cutting, or abrading and thus would render the materials friable, they must be removed prior to the renovation or demolition.

(V) If for any reason, any renovation or demolition results in an associated disturbance of ACM or Class II nonfriable ACM outside of a containment or work area then, prior to continuing with any renovation or demolition activity, the
owner/operator shall secure, stabilize and survey the affected facility areas and submit and obtain an approved Procedure 5 plan, prior to any asbestos clean-up.

(D) Removal Procedures

(i) One or more of the following procedures shall be used when removing or stripping ACM:

(I) Procedure 1 - HEPA Filtration

Remove ACM within an isolated work area. The following techniques shall be used during Procedure 1 ACM removal activities:

(1) All stationary objects and surfaces not intended for removal or stripping of ACM shall be covered with plastic sheeting;

(2) All air passageways, such as doors, windows, vents and registers in the work area, shall be covered and rendered air tight with plastic sheeting or hard wooden barriers with studded support. Air passageways used to provide makeup air for the isolated work space need not be covered;

(3) All sources of air movement, including the air-handling system, shall be shut off or temporarily modified to restrict air movement into the work zone;

(4) The barriers used for the construction of the isolated work area shall be equipped with transparent viewing ports which allow outside observation of all stripping and removal of ACM;

(5) The isolated work area shall be vented, with negative air pressure to a HEPA filtration system, which shall be operated continuously from the commencement of removal activities through the final clean-up of the work area;
(6) The HEPA filter shall be free of tears, fractures, holes or other types of damage and shall be securely latched and properly situated in the holding frame to prevent air leakage from the filtration system; and

(7) ACM shall be adequately wet during the removal process.

(II) Procedure 2 - Glovebag
Remove by the glovebag method or mininenclosures designed and operated according to 29 CFR Section 1926.1101(g), Appendix G, and current Cal/OSHA requirements.

(III) Procedure 3 - Adequate Wetting
Procedure 3 shall only be used to remove nonfriable asbestos-containing materials, using the following techniques:

(1) All exposed ACM shall be adequately wet during cutting or dismantling procedures.

(2) ACM shall be adequately wet while it is being removed from facility components and prior to its removal from the facility.

(3) Drop cloths and tenting shall be used to contain the work area to the extent feasible.

(4) Only non-power tools shall be used.

(IV) Procedure 4 - Dry Removal
Obtain written approval from the Executive Officer's designee prior to using dry removal methods for the control of asbestos emissions when adequate wetting procedures in the renovation work area would unavoidably damage equipment or present a safety hazard. Dry removal methods may include one or more of the following:

(1) Use of a HEPA filtration system, operated in accordance with subclause (d)(1)(D)(i)(I), within an isolated work area;
(2) Use of a glovebag system, operated in accordance with subclause (d)(1)(D)(i)(II); or

(3) Use of leak-tight wrapping or an approved alternative, to contain all ACM removed in units or sections prior to dismantlement.

(V) Procedure 5 - Approved Alternative

(1) Use an alternative combination of techniques and/or engineering controls. Written approval from the Executive Officer or his designee shall be obtained prior to the use of a Procedure 5 Approved Alternative.

(2) The Executive Officer may pre-approve specific combinations of techniques and/or engineering controls in writing, which may be used by any person as a Procedure 5 Approved Alternative, subject to such conditions and limitations as required by the Executive Officer.

(3) No person shall use a Procedure 5 Approved Alternative without complying with all of the conditions and limitations set forth therein.

(ii) Specific procedure requirements

(I) No person shall remove or strip ACM or Class II nonfriable ACM that has suffered damage from fire, explosion, or natural disaster without the use of a Procedure 5 Approved Alternative.

(E) Handling Operations

All ACWM shall be collected and placed in transparent, leak-tight containers or wrapping. The following techniques shall be used.

(i) ACM shall be carefully lowered to the ground or a lower floor without dropping, throwing, sliding, or otherwise damaging or disturbing the ACM;
(ii) ACM which has been removed or stripped more than 50 feet above ground level and was not removed as units or in sections shall be transported to the ground via leak-tight chutes or containers;

(iii) ACWM shall be collected, and sealed in leak-tight containers. ACWM shall be adequately wet prior to and during collection and packaging. Alternatively, areas of Class I nonfriable asbestos-containing material which have become friable or have been subjected to sanding, grinding, cutting, or abrading, may be sealed via encapsulation; and

(iv) All surfaces in the isolated work area shall be cleaned, with a vacuum system utilizing HEPA filtration, wet mopping and wipe down with water, or by an equivalent methods, prior to the dismantling of plastic barriers or sealed openings within the work area.

(F) Freezing Temperature Conditions
When the temperature at the point of wetting is below 0°C (32°F), the wetting provisions of subparagraph (d)(1)(D) shall be superseded by the following requirements:

(i) Facility components containing, coated with, or covered with ACM shall be removed as units or in sections to the maximum extent possible; and

(ii) The temperature in the area containing the facility components shall be recorded at the beginning, middle, and end of each workday during periods when wetting operations are suspended due to freezing temperatures. Daily temperature records shall be available for inspection by the District during normal business hours at the demolition or renovation site. Records shall be retained for at least 2 years.

(G) On-Site Representative
At least one on-site representative, such as a foreman, manager, or other authorized representative, trained in accordance with the provisions of paragraphs (i)(1) and (i)(3), shall be present during the stripping, removing, handling, or disturbing of ACM. Evidence that the required training has been completed shall be
posted at the demolition or renovation site and made available for inspection by the Executive Officer's designee.

(H) On-Site Proof
The following shall be maintained on-site and shall be provided to the District upon request:

(i) California State Contractor's License certification number;
(ii) Cal/OSHA Registration number;
(iii) copies of surveys, conducted pursuant to subparagraph (d)(1)(A); and
(iv) copies of notifications submitted pursuant to subparagraph (d)(1)(B).

Proof shall be consistent with the most recently updated information submitted in the notification.

(I) On-Site Storage
No ACWM shall be stored on-site except in a leak-tight container. When leak-tight containers are not in use, they shall be kept inside an enclosed storage area. The enclosed storage area shall not be accessible to the general public and shall be locked when not in use.

(J) Disposal
All ACWM shall be disposed of at a waste disposal site that is operated in accordance with paragraph (d)(3) of this rule.

(K) Container Labeling
Leak-tight containers which contain ACWM shall be labeled as specified in subdivision (e).

(L) Transportation Vehicle Marking
Vehicles used to transport ACWM shall be marked, as specified in subdivision (e), during the loading and unloading of ACWM.

(M) Waste Shipment Records
Waste Shipment Records shall be prepared and handled in accordance with the provisions of paragraph (f)(1).

(N) Recordkeeping
Records shall be kept as specified in subdivision (g).

(2) ACWM Storage Facilities
The owner or operator of any ACWM storage facility shall comply with the following requirements:
(A) Maintenance and Handling
   (i) ACWM shall be stored in leak-tight containers;
   (ii) All leak-tight containers shall be labeled as specified in paragraph (e)(1); and
   (iii) ACWM shall be stored in an enclosed locked area.

(B) Transportation Vehicle Marking
   Vehicles used to transport ACWM shall be marked, as specified in paragraph (e)(3), during the loading and unloading of ACWM.

(C) Waste Shipment Records
   Waste Shipment Records shall be handled in accordance with the provisions of paragraph (f)(2).

(D) Recordkeeping
   Records shall be maintained as specified in paragraph (g)(2).

(3) Active Waste Disposal Sites
The owner or operator of any waste disposal site where ACWM is being deposited shall comply with the following requirements:

(A) Maintenance and Handling
   (i) ACWM shall be in leak-tight containers;
   (ii) Warning signs, as specified in paragraph (e)(2), shall be displayed at all entrances and at intervals of 330 feet or less along the property line of the site or along the perimeter of the sections of the site where ACWM is being deposited;
   (iii) Access to the general public shall be deterred by maintaining a fence along the perimeter of the site or by using a natural barrier;
   (iv) All ACWM shall be maintained in a separate disposal section;
   (v) ACWM deposited at the site shall be covered with at least six (6) inches of nonasbestos-containing material at the end of normal business hours. The waste shall be compacted only after it has been completely covered with nonasbestos-containing material. A low pressure water spray or nontoxic dust suppressing chemical shall be used for any surface wetting after compaction; and
   (vi) ACWM shall be covered with a minimum of an additional thirty (30) inches of compacted nonasbestos-containing
material prior to final closure of the waste disposal site, and shall be maintained to prevent exposure of the ACWM.

(B) Transportation Vehicle Marking

Vehicles used to transport ACWM shall be marked, as specified in paragraph (e)(3), during the loading and unloading of ACWM.

(C) Waste Shipment Records

Waste Shipment Records shall be handled in accordance with the provisions of paragraph (f)(2).

(D) Recordkeeping

Records shall be maintained as specified in paragraph (g)(3).

(e) Warning Labels, Signs, and Markings

Warning labels, signs, and markings shall be used to identify asbestos related health hazards and comply with the following requirements:

(1) Leak-Tight Containers

Leak tight containers shall be labeled according to the following requirements:

(A) Warning labels for leak-tight containers and wrapping shall have letters of sufficient size and contrast as to be readily visible and legible, and shall contain the following information, or as specified by Occupational Safety and Health Standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.1001(j)(2) or 1926.58(k)(2)(iii), or current Cal/OSHA requirements:

CAUTION
Contains Asbestos Fibers
Avoid Opening or Breaking Container
Breathing Asbestos is Hazardous to Your Health

or

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

(B) Leak-tight containers that are transported off-site shall be labeled with the name of the waste generator and the location at which the
waste was generated. The location description shall include the street address.

(2) Active Waste Disposal Sites
No person shall operate an active waste disposal site unless warning signs are conspicuously posted and meet the following:

(A) Are displayed in such a manner and location that a person can easily read the legend;

(B) Conform to the requirements for 51 cm x 36 cm (20 inch x 14 inch) upright format signs specified in 29 CFR 1910.145 (d)(4) and this paragraph;

(C) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this subparagraph:

<table>
<thead>
<tr>
<th>Legend</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos Waste Disposal Site</td>
<td>2.5 cm (1 inch) Sans Serif, Gothic or Block</td>
</tr>
<tr>
<td>Do Not Create Dust</td>
<td>1.9 cm (3/4 inch) Sans Serif, Gothic or Block</td>
</tr>
<tr>
<td>Breathing Asbestos is Hazardous to Your Health</td>
<td>14 Point Gothic</td>
</tr>
</tbody>
</table>

; and

(D) Have spacing between any two lines at least equal to the height of the upper of the two lines.

(3) Transportation Vehicles
Markings for transportation vehicles shall:

(A) Be displayed in such a manner and location that a person can easily read the legend;

(B) Conform to the requirements for 51 cm x 36 cm (20 inch x 14 inch) upright format signs specified in 29 CFR 1910.145 (d)(4) and this paragraph; and

(C) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph:
<table>
<thead>
<tr>
<th>Legend</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER</td>
<td>2.5 cm (1 inch) Sans Serif, Gothic or Block</td>
</tr>
<tr>
<td>ASBESTOS DUST HAZARD</td>
<td>2.5 cm (1 inch) Sans Serif, Gothic or Block</td>
</tr>
<tr>
<td>CANCER AND LUNG DISEASE HAZARD</td>
<td>1.9 cm (3/4 inch) Sans Serif, Gothic or Block</td>
</tr>
<tr>
<td>Authorized Personnel Only</td>
<td>14 Point Gothic</td>
</tr>
</tbody>
</table>

; and

(D) Have spacing between any two lines at least equal to the height of the upper of the two lines.

(f) Waste Shipment Records
(1) Waste Generators

A waste generator shall comply with the following:

(A) Waste shipment information shall include, but not be limited to, the following:

(i) The name, address, and telephone number of the waste generator;

(ii) The name, address, and telephone number of the South Coast Air Quality Management District;

(iii) The quantity of ACWM in cubic meters or cubic yards;

(iv) The name and telephone number of the disposal site owner and operator;

(v) The name and physical site location of the disposal site;

(vi) The date transported;

(vii) The name, address, and telephone number of the transporter; and

(viii) A signed certification that the contents of this consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and in proper condition for highway transport according to applicable federal, state, and local regulations.
Rule 1403 (Cont.)  
(Amended October 5, 2007)

(B) A copy of the Waste Shipment Record shall be provided to the disposal site owner or operator at the same time the ACWM is delivered to the disposal site.

(C) If a copy of the Waste Shipment Record, signed by the owner or operator of the designated disposal site, is not received within 35 days of the date the ACWM was accepted by the initial transporter, the transporter and/or the owner or operator of the designated disposal site shall be contacted to determine the status of the waste shipment.

(D) If a copy of the Waste Shipment Record, signed by the owner or operator of the designated disposal site, is not received within 45 days of the date the ACWM was accepted by the initial transporter, a written report shall be submitted to the District and shall include the following:

(i) A copy of the Waste Shipment Record for which a confirmation of delivery was not received; and

(ii) A signed cover letter explaining the efforts taken to locate the ACWM shipment and the results of those efforts.

(2) Storage and Active Waste Disposal Facilities

The owner or operator of any storage facility or active waste disposal site shall comply with the following requirements:

(A) Waste shipment information shall be filled out on the Waste Shipment Record forms provided by the waste generator, for all ACWM received from an off-site facility, and shall include, but not be limited to, the following:

(i) The name, address, and telephone number of the waste generator;

(ii) The name, address, and telephone number of the transporter;

(iii) The quantity of ACWM received in cubic meters or cubic yards; and

(iv) The date of receipt.

(B) No shipment of ACWM shall be received from an off-site facility unless it is accompanied with a completed Waste Shipment Record signed by the waste generator.
(C) If there is a discrepancy between the quantity of ACWM designated in the Waste Shipment Record and the quantity actually received, and if the discrepancy cannot be resolved with the waste generator within 15 days of the date the ACWM was received, a written report shall be filed with the District. The report shall include the following:

(i) A copy of the Waste Shipment Record; and

(ii) A signed cover letter explaining the discrepancy, and the attempts to reconcile it.

(D) If any shipment of ACWM is not properly containerized, wrapped, or encapsulated, a written report shall be filed with the District. The report shall be postmarked or delivered within 48 hours after the shipment is received, or the following business day.

(E) A signed copy of the Waste Shipment Record shall be provided to the waste generator no later than 30 calendar days after the ACWM is delivered to the disposal site.

(g) Recordkeeping

(1) Demolition and Renovation Activities

The owner or operator of any demolition or renovation activity shall maintain the following records for not less than three (3) years and make them available to the District upon request:

(A) A copy of all survey-related documents;

(B) A copy of all submitted notifications. A copy of the most recently updated written notification submitted in accordance with the provisions of this rule shall be maintained on-site;

(C) A copy of all written approvals obtained under the requirements of subparagraph (d)(1)(D);

(D) A copy of all Waste Shipment Records;

(E) All training informational materials used by an owner or operator to train supervisors or workers for the purposes of this rule; and

(F) A copy of all supervisors and workers training certificates and any annual reaccreditation records which demonstrate EPA-approved or state accreditation to perform asbestos-related work.
(2) Storage Facilities
The owner or operator of any storage facility shall maintain a copy of all Waste Shipment Records on site for not less than three (3) years and make them available to the District upon request.

(3) Active Waste Disposal Sites
The owner or operator of an active waste disposal site shall maintain the following information on site for not less than three (3) years and make them available to the District upon request:

(A) A description of the active waste disposal site, including the specific location, depth and area, and quantity, in cubic meters or cubic yards, of ACWM within the disposal site on a map or diagram of the disposal area;
(B) A description of the methods used to comply with waste disposal requirements; and
(C) A copy of all Waste Shipment Records.

(4) In lieu of the requirements of paragraph (g)(1), the owner or operator of a renovation activity at any facility, in which less than 100 square feet of surface area of ACM on facility components is removed or stripped, may instead elect to maintain the following information for a period of not less than three (3) years, and make it available to the District upon request:

(A) A copy of all survey-related documents;
(B) Records containing an estimate of the amount of ACM removed or stripped at each renovation subject to this paragraph;
(C) Type of removal controls used for each renovation; and
(D) A copy of all Waste Shipment Records.

(h) Sampling Protocols and Test Methods
(1) Sampling of materials suspected to contain asbestos, to comply with this rule, shall be conducted following the provisions of 40 CFR Part 763.86.

(2) Analysis of materials for asbestos, to comply with this rule, shall be determined by using SCAQMD Method 300-91 as detailed in the District's Laboratory Methods of Analysis for Enforcement Samples manual, or by using the Method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy. Asbestos analyses performed to comply with this rule must be undertaken by laboratories accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).
(i) Training Requirements

The owner or operator performing a demolition or renovation activity shall provide asbestos-related training as follows:

(1) On-site supervisory personnel shall successfully complete the Asbestos Abatement Contractor/Supervisor course pursuant to the Asbestos Hazard Emergency Response Act (AHERA), and obtain and maintain accreditation as an AHERA Asbestos Abatement Contractor/Supervisor.

(2) Workers shall successfully complete the Abatement Worker course pursuant to the AHERA.

(3) Supervisory personnel and workers shall be trained on the provisions of this rule as well as on the provisions of 40 CFR Part 61.145, 61.146, 61.147 and 61.152 (Asbestos NESHAP provisions) and Part 763, and the means by which to comply with these provisions.

(j) Exemptions

(1) The notification requirements of subparagraph (d)(1)(B) and the training requirements of subdivision (i) shall not apply to renovation activities, other than planned renovation activities which involve non-scheduled renovation operations, in which less than 100 square feet of surface area of ACM are removed or stripped.

(2) The notification requirements of subparagraph (d)(1)(B) and the training requirements of subdivision (i) shall not apply to planned renovation activities which involve non-scheduled renovation operations, in which the total quantity of ACM to be removed or stripped within each calendar year of activity is less than 100 square feet of surface area.

(3) Clauses (d)(1)(A)(iii)(V), (VI), and (VII) and subclause (d)(1)(B)(ii)(XV) shall not apply to the owner or operator of any renovation or demolition activity, when the suspected material is treated as ACM when being removed, stripped, collected, handled, and disposed of in accordance with the provisions of this rule.

(4) The portion of clause (d)(1)(A)(iv) which requires Cal/OSHA certification shall not apply to persons performing work not subject to the certification requirement established by regulations pursuant to the Labor Code, Section 6501.5.

(5) Subclause (d)(1)(B)(ii)(XI) and clause (d)(1)(H)(i), requiring a California State Contractors License Certification number, shall not apply to persons
performing work not subject to the certification requirement established pursuant to the Business and Professions Code, Section 7058.5.

(6) Subclause (d)(1)(B)(ii)(XII) and clause (d)(1)(H)(ii), requiring Cal/OSHA registration, shall not apply to persons performing work not subject to the registration requirement established pursuant to the Labor Code, Section 6501.5.

(7) The provisions of subparagraph (f)(2)(E) shall not apply to storage facilities that do not meet the definition of an active waste disposal site as defined by paragraph (c)(1).

(8) The handling requirements of phrases (d)(1)(D)(i)(I)(2), (d)(1)(D)(i)(I)(5), and (d)(1)(D)(i)(I)(6), the training requirements of paragraphs (i)(1) and (i)(2), the reporting of training certificate requirement of subclause (d)(1)(B)(ii)(XVI), and the on-site proof of training requirement of subparagraph (d)(1)(G) and subdivision (i) shall not apply to the exclusive removal of asbestos-containing packings, gaskets, resilient floor covering and asphalt roofing products which are not friable, have not become friable, and have not been subjected to sanding, grinding, cutting, or abrading.

(9) The provisions of this rule shall not apply to an owner-occupant of a residential single-unit dwelling who personally conducts a renovation activity at that dwelling.

(10) The survey requirements of subparagraph (d)(1)(A) shall not apply to renovation activities of residential single-unit dwellings in which less than 100 square feet of surface area of ACM are removed or stripped.
Appendix B
Asbestos in Buildings Guidance for Service and Maintenance Personnel
Asbestos in Buildings

Guidance for Service and Maintenance Personnel
Definitions

Asbestos: A mineral composed of small, thin fibers. It is common in many building materials.

Cememntious: Materials that are hard and usually rough-textured or cement-like in appearance.

Flexible: Materials that can be crumbled, pulverized, or reduced to powder by hand pressure.

HEPA: (High Efficiency Particulate Air) A special type of filter that can trap asbestos fibers.

Introduction

This booklet has been prepared by the United States Environmental Protection Agency to assist service and maintenance personnel in implementing special Operating and Maintenance procedures in buildings containing asbestos. The information is extracted from “Guidance for Controlling Asbestos-Containing Materials in Buildings” (EPA 560/5-85-024).

If you follow the steps in this booklet you will:

* Protect the health of people using the building
* Protect your own health

If there is asbestos in your building, you should ask your supervisor for training on:

* Asbestos-related hazards
* How to avoid releasing asbestos fibers into the air
* How to avoid breathing asbestos fibers by proper use of respirators
* How to handle asbestos materials.
Breathing airborne asbestos fibers has been associated with:

- Asbestosis—a serious lung disease
- Lung cancer
- Mesothelioma—a cancer of the lining of the lung or abdominal cavities.

Airborne asbestos levels in buildings are much lower than those in industrial workplaces where serious health effects have been observed. However, it is still important to minimize exposure to asbestos fibers by following proper work practices.

- Fibrous, fluffy sprayed-on material (fireproofing)
- Frangible, cementitious sprayed-on material (acoustical plaster)
- Perforated, nonfrangible wallboard with fibrous sprayed-on material behind
- Frangible fireproofing material on beam with pipe insulation below

Do not overlook the boiler room:

- Boilers and pipes are often insulated with asbestos materials
- The walls and ceilings of the boiler room may be covered with asbestos material.
**Disturbing Asbestos Materials**

- **Do not** drill holes in asbestos materials.
- **Do not** hang plants or anything else from ceilings covered with asbestos materials.
- **Do not** pin or hang pictures on walls covered with asbestos materials.
- **Do not** sand asbestos floor tiles or backing material.
- **Do not** damage asbestos material while moving furniture, etc.
- **Do not** disturb asbestos material when replacing light bulbs, etc.
- **Do not** allow curtains, drapes or dividers to damage asbestos materials.
Cleaning

Improper cleaning can set up diabetic's fibers.

**NOT THIS**

- Do **not** dust with a brush.
- Do **not** dry sweep floors.

**BUT THIS**

- Dust with a damp cloth.
- Wet mop floors.
**NOT THIS**

* Do not use an ordinary vacuum to clean up asbestos debris.

* Do not brush or sweep ceilings and walls covered with asbestos materials.

**BUT THIS**

* Use only a special HEPA vacuum to clean up asbestos debris.

* Avoid touching or disturbing ceilings and walls covered with asbestos materials.
General Maintenance

* Take care when doing routine maintenance jobs around asbestos material.

**NOT THIS**

* **DO NOT** use a dust mask. It does not protect you against asbestos fibers.

**BUT THIS**

* Wear a respirator that is approved for work with asbestos.

If you have to remove ceiling tiles below asbestos material:

* **DO NOT** start work without protection.
* **DO NOT** allow other people in the area.
* **DO NOT** leave dust and debris after you have finished.

If you change filters in the Air Ventilation System:

* **DO NOT** remove the filter dry.
* **DO NOT** shake the filter. Asbestos fibers could be released.

* Wear an approved respirator.
* Clear the area of other people.
* Use a drop cloth and clean up carefully after each job.

* Mist the filter with water.
* Remove the filter carefully.
* Dispose of properly.
Boiler Room Maintenance

Take special care when working in boiler rooms.

- Suggest that pipe insulation that contains asbestos be labeled with "CAUTION-ASBESTOS".

**NOT THIS**

If you have to repair boilers or pipes that have asbestos insulation:

- **DO NOT** start work without protection.
- **DO NOT** allow other people in the area.
- **DO NOT** allow asbestos material to fall on the floor.
- **DO NOT** allow asbestos fibers to be released into the air.

**BUT THIS**

- **DO NOT** start work without protection.
- **DO NOT** allow other people in the area.
- **DO NOT** allow asbestos material to fall on the floor.
- **DO NOT** allow asbestos fibers to be released into the air.

- Wear an approved respirator.
- Clear the area of other people.
- Use a drop cloth.
- Use a glove bag (Ask your supervisor for details).
- Clean up carefully.
Disposal

- Place all dampened filters, cloths, mopheads and other asbestos wastes in double ply (6 mil) plastic bags.
- Seal the bag with heavy duty tape.
- Label each bag with a sign: "CAUTION: Asbestos Waste".
- Place the sealed and labeled bags with other solid waste material for pick-up and delivery to an approved waste disposal site.
- Asbestos materials should be disposed of according to Federal and local regulations.

Actions to Take

- Know where the asbestos is in your building.
- If you find materials that could contain asbestos, recommend to the supervisor that they be tested.
- Ask your supervisor for training in proper ways to work around asbestos materials.
- If you see materials that have been disturbed, report the damage to your supervisor.
- If the cleaning or maintenance in your building is not being done properly, see that it is corrected.
- Keep on hand items useful for working on or around asbestos materials. These include:
  - disposal bags
  - respirators
  - tools for working on insulation
  - disposable coveralls
  - dropcloths
  - water bottles for misting filters, etc.
  - glove bags.
Further Information

If you work in a school and have not received these documents—ask your supervisor for them.

If you need more information:

* Refer to EPA publications
* For copies of this and other EPA documents on asbestos call 800-424-9065 (554-1404 In Washington, D.C.)
* Contact your EPA regional asbestos coordinator for technical assistance and information on training.

EPA Regional Asbestos Coordinators

Region 1
510-225-0585
Maine
Vermont
New Hampshire
Connecticut
Massachusetts
Rhode Island

Region 2
202-267-6013
New York
New Jersey
Puerto Rico
Virgin Islands

Region 3
215-267-0633
Pennsylvania
Maryland
Delaware
Virginia
West Virginia
District of Columbia

Region 4
404-679-3302
Georgia
Alabama
Mississippi
Florida
North Carolina
South Carolina
Tennessee
Kentucky

Region 5
312-356-6006
Indiana
Ohio
Illinois
Michigan
Wisconsin
Minnesota

Region 6
(214) 671-5761
Texas
New Mexico
Oklahoma
Arkansas
Louisiana

Region 7
312-886-6229
Kansas
Missouri
Nebraska
Iowa

Region 8
303-287-1010
Colorado
Utah
Wyoming
Montana
North Dakota
South Dakota

Region 9
415-974-3533
California
Nevada
Arizona
Hawaii
Guam, Am. Samoa

Region 10
206-220-2370
Washington
Oregon
Idaho
Alaska
Appendix C—Managing Asbestos in Place: A Building Owner’s Guide to Operations and Maintenance Programs for Asbestos Containing Materials
Managing Asbestos In Place

A Building Owner's Guide to Operations and Maintenance Programs for Asbestos-Containing Materials
Contents

ACKNOWLEDGEMENTS ............................................................................................................................ v
FOREWORD ................................................................................................................................................ vii

1. WHY IS ASBESTOS A PROBLEM?
   Introduction and Overview ..................................................................................................................... 1
   • Background ..................................................................................................................................... 2
   • Chapter Summary ............................................................................................................................ 4

2. WHAT IS AN O&M PROGRAM?
   Purpose and Scope of an Operations and Maintenance program ......................................................... 5
   • Purpose of O&M Program ................................................................................................................ 5
   • Scope of an O&M Program ............................................................................................................... 5
   • Chapter Summary ............................................................................................................................ 6

3. HOW DOES THE PROGRAM START?
   Laying the Foundation for an Effective O&M Program ......................................................................... 7
   • The Asbestos Program Manager .................................................................................................... 7
   • Building Inspection and Assessment ............................................................................................... 7
   • Developing an O&M Program ......................................................................................................... 8
   • Implementing and Managing an O&M Program ............................................................................. 8
   • Cost Considerations ........................................................................................................................ 9
   • Selecting and Implementing Alternative Abatement Actions ............................................................ 9
   • Chapter Summary ........................................................................................................................... 11

4. WHAT DOES AN O&M PROGRAM INCLUDE?
   O&M Program Elements ..................................................................................................................... 12
   • Informing Building Workers, Tenants, and Other Occupants ......................................................... 12
   • ACMS Survey/Reinforcement and Periodic Surveillance ................................................................. 14
   • Supplement to Visual/Physical Evaluation ....................................................................................... 14
   • Work Control/Permit System ........................................................................................................... 15
   • O&M Work Practices ...................................................................................................................... 16
     – Worker protection programs ......................................................................................................... 17
     – Basic O&M Procedures ............................................................................................................... 18
     – O&M Cleaning Practices ............................................................................................................ 19
     – Procedures for Asbestos Fiber Release Episodes ......................................................................... 20
   • Recordkeeping ............................................................................................................................... 22
   • Chapter Summary ........................................................................................................................... 22

5. WHAT O&M TRAINING IS NECESSARY?
   Types of Training ................................................................................................................................. 23
   • Chapter Summary ........................................................................................................................... 25
6. WHAT REGULATIONS AFFECT ASBESTOS MANAGEMENT PROGRAMS IN BUILDINGS, ESPECIALLY O&M PROGRAMS?

Federal, State, and Local Regulations Affecting O&M Programs .............................................. 26

- OSHA Regulations & EPA Worker Protection Rule ................................................................. 26
  - Small-scale, Short-duration Projects ................................................................................. 27
- EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Regulations .... 27
  - Notification ......................................................................................................................... 28
  - Emissions Control and Waste Disposal ............................................................................ 28
- Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response,
  Compensation, and Liability Act (CERCLA, or "Superfund") ........................................... 28
- Asbestos Hazard Emergency Response Act (AHERA) ......................................................... 28
- Asbestos Ban and Phaseout Rule ......................................................................................... 28
- Chapter Summary .............................................................................................................. 29

APPENDIX A.

Glossary ............................................................................................................................... 30

APPENDIX B.

Sample Recordkeeping Forms ............................................................................................. 31

APPENDIX C.

Illustrative Organization Charts ......................................................................................... 35

APPENDIX D.

Additional Assistance (EPA, NESW, OSHA; Training ) ....................................................... 37

APPENDIX E.

Respiratory Protection Recommendations ........................................................................... 38

APPENDIX F.

Existing EPA Guidance For ACM Control ........................................................................... 39

APPENDIX G.

Sample List: Suspect Asbestos-Containing Materials .......................................................... 40

APPENDIX H.

References ............................................................................................................................ 40

DISCLAIMER

This document was prepared under contract to an agency of the United States Government. Neither the United States Government nor any of their employees makes any warranty, expressed or implied, or assume any legal liability for any third party’s use of or the results of such use of any information, product, or process discussed in this document. Mention or illustration of company or trade names, or of commercial products does not constitute endorsement by the U.S. Environmental Protection Agency.
The time and effort that many individuals contributed to the development of this document is gratefully acknowledged by the U.S. Environmental Protection Agency (EPA). The material in this publication represents EPA’s approximately 11 years of experience in considering public input and fine-tuning policies on managing asbestos-containing materials in buildings. This document incorporates views expressed by safety and health professionals, property owners and managers, public officials, general industry representatives, workers, and the general public.

The primary EPA developer and coordinator of the final document was Dr. Robert Jordan of the Technical Assistance Section, Environmental Assistance Division, Office of Toxic Substances. Without Bob’s constant oversight, combined with his technical knowledge and concern that the document be representative of state-of-the-art asbestos management, this document would not have reached the public.

Joe Schechter, Chief of the Technical Assistance Section, managed the project and helped clarify and edit the Guide. Bob McNally, Chief of the Assistance Programs Development Branch, was instrumental in the formative period of the Guide’s development and also devoted long hours to its review. Other important contributions within the Environmental Assistance Division came from Tom Tom and Dave Kling. Sylvia Thomas provided necessary assistance in revisions of the early drafts. Esther Tepper and Jane Gurin helped review the Guide in its final revisions, to make sure the document was written in easy-to-understand language.

The original work which provided the foundation for the project was performed under a contract with Battelle Memorial Institute (No. 68-02-4294) by Dr. Dale Keyes and Dr. Jean Chesson, under the direction of Edie Sterrett and Cindy Stroup of the EPA Exposure Evaluation Division. They prepared the first drafts of the document and were instrumental in establishing its final format.

EPA staff also gratefully acknowledge the work of staff from the Georgia Tech Research Institute (GTRI). Through a cooperative agreement with EPA they served as the overall project coordinator and provided thoughtful technical guidance throughout this entire process. The GTRI team also developed several key sections of the Guide.

This publication was refined through a peer review meeting held in October 1988 in Washington, DC, and by a series of comment periods provided through May 1990. The following individuals gave their time and provided comments:

John Biechman, Safe Buildings Alliance
Wolfgang Brandner, U.S. EPA Region VII
Frank Bull, Bull, Brown & Kilgo Architects
Eva Clay, The Environmental Institute
William Cobbs, U.S. General Services Administration
Mark Demyanek, Georgia Tech Research Institute
Michael Duffy, Service Employees International Union
Paul Fidducia, Winston and Strawn
Eugene Fisher, Association of Wall and Ceiling Industries
Douglas Greenaway Consultant (formerly, Building Owners and Managers Association International)
David Harris, National Institute of Building Sciences
Steve Hays, Gobbell Hays Partners
Joseph Hopkins, U.S. Department of Energy
David Mayer, Georgia Tech Research Institute
Richard Mendes, New York City Department of Environmental Protection
Michael Miles, Tishman Speyer Properties
Roger Morse, ENTEK Environmental and Technical Services, Inc.
Robert Navratil, RREEF Funds, Construction and Engineering
Anthony Restaino, U.S. EPA Region V
Richard Roth, Social Security Administration
Sims Roy, U.S. EPA, Office of Air Quality Planning and Standards
In addition to these individuals, the EPA acknowledges the contribution of the Policy Dialogue Group on Asbestos in Public and Commercial Buildings, which met several times during 1989–1990. The purpose of this multidisciplinary group was to identify the problems associated with asbestos in public and commercial buildings and to develop policy recommendations for solving these problems. Many comments raised by the Dialogue Group in the area of asbestos management were incorporated into this document.
In February 1988, the Administrator of the Environmental Protection Agency (EPA) recommended to Congress that the Agency work during the next three years to enhance the nation’s technical capability in asbestos by helping building owners better select and apply appropriate asbestos control and abatement actions in their buildings. The publication of this guidance document is EPA’s most extensive effort to date to carry out that recommendation. In fact, *Managing Asbestos In Place* is the most comprehensive asbestos guide published by EPA since the Agency expanded and updated *Guidance for Controlling Asbestos-Containing Materials in Buildings (also known as the Purple Book)* in June 1985. Based on the insights and recommendations of nationally recognized asbestos experts, this new guide, along with a new operations and maintenance work practices manual expected to be available in 1991, provides “state-of-the-art” instruction to building owners to help them successfully manage asbestos-containing materials in place.

*Managing Asbestos in Place* does not supplant the 1985 Purple Book as EPA’s principal asbestos guidance document. Rather, based on our experience since 1985, it expands and refines the Purple Book’s guidance for a special operations and maintenance (O&M) program. In particular, the guide more strongly emphasizes the importance of in-place management. The guide’s purpose is two-fold. First, it offers building owners the more detailed and up-to-date instruction they need to carry out a successful O&M program. Second, it informs building owners, lenders, and insurers that a properly conducted O&M program can in many cases be as appropriate an asbestos control strategy as removal. Furthermore, in some cases, an O&M program is more appropriate than other asbestos control strategies, including removal.

Emphasizing the importance and effectiveness of a good O&M program is a critical element of EPA’s broader effort to put the potential hazard and risk of asbestos exposure in proper perspective. That effort centers around communicating the following jive facts, which EPA hopes will help calm the unwarranted fears that a number of people seem to have about the mere presence of asbestos in their buildings and discourage the spontaneous decisions by some building owners to remove all asbestos-containing material regardless of its condition.

**FACT ONE:** Although asbestos is hazardous, the risk of asbestos-related disease depends upon exposure to airborne asbestos fibers.

In other words, an individual must breathe asbestos fibers in order to incur any chance of developing an asbestos-related disease. How many fibers a person must breathe to develop disease is uncertain. However, at very low exposure levels, the risk maybe negligible or zero.

**FACT TWO:** Based upon available data, the average airborne asbestos levels in buildings seem to be very low. Accordingly, the health risk to most building occupants also appears to be very low.

A 1987 EPA study found asbestos air levels in a small segment of Federal buildings to be essentially the same as levels outside these buildings. Based on that limited data, most building occupants (i.e., those unlikely to disturb asbestos-containing building materials) appear to face only a very slight risk, if any, of developing an asbestos-related disease.
FACT THREE: Removal is often not a building owner’s best course of action to reduce asbestos exposure. In fact, an improper removal can create a dangerous situation where none previously existed.

By their nature, asbestos removals tend to elevate the airborne level of asbestos fibers. Unless all safeguards are properly applied, a removal operation can actually increase rather than decrease the risk of asbestos-related disease.

FACT FOUR: EPA only requires asbestos removal in order to prevent significant public exposure to airborne asbestos fibers during building demolition or renovation activities.

Asbestos removal before the wrecking ball swings into action is appropriate to protect public health. At other times, EPA believes that asbestos removal projects, unless well-designed and properly performed, can actually increase health risk.

FACT FIVE: EPA does recommend a proactive, in-place management program whenever asbestos-containing material is discovered.

As this guide will explain in some detail, in-place management does not mean “do nothing.” It means having a program to ensure that the day-to-day management of the building is carried out in a manner that minimizes release of asbestos fibers into the air, and ensures that when asbestos fibers are released, either accidentally or intentionally proper control and cleanup procedures are implemented. As such, it may be all that is necessary to control the release of asbestos fibers, until the asbestos-containing material in a building is scheduled to be disturbed by renovation or demolition activities.
Why Is Asbestos a Problem?

Introduction: Asbestos in Buildings

This U.S. Environmental Protection Agency (EPA) guide is primarily directed to owners and managers of office buildings, shopping centers, apartment buildings, hospitals, and similar facilities which may contain asbestos materials. Managers of industrial plants and other types of structures may need to supplement this information with additional specialized guidance. This document gives building owners, managers, workers, and other key building staff basic information on how to develop and carry out high-quality operations and maintenance programs for managing asbestos in place to safeguard the health of all building occupants. An operations and maintenance (O&M) program can be defined as a formulated plan of training, cleaning, work practices, and surveillance to maintain asbestos-containing materials (ACM) in good condition.

In this document you will find the following information:

- The objectives of an O&M program, and an indication of the scope of O&M activities (Chapter 2);
- Basic steps to take before starting an O&M program, including an initial survey and evaluation of ACM (Chapter 3);
- How to implement and manage the program, including some basic cost considerations (Chapter 3);
- O&M work practices that protect both workers and the general building environment (Chapter 4);
- Recordkeeping suggestions and requirements (a section of Chapter 4);
- Training recommendations and requirements for workers performing O&M activities (Chapter 5); and
- An overview of federal regulations, including those affecting O&M programs (Chapter 6).

In addition, the Appendices provide other useful information, including a glossary of useful terms, and contacts for additional assistance.

An O&M program can be defined as a formulated plan of training, cleaning, work practices, and surveillance to maintain asbestos-containing materials in good condition.
Air Pollutants (NESHAP) regulations on asbestos may require ACM removal prior to renovation and/or demolition projects, to prevent significant asbestos releases into the air (see Chapter 6). Additionally, removal of some ACM in a building will be necessary if the material has been damaged beyond repair. However, at other times, removal is often not a building owner’s best course of action to reduce asbestos exposure. (Extraneous factors—for example, difficulty in obtaining insurance, or obtaining financing relative to a real estate transaction—may actually represent the driving forces in a decision to remove all ACM, rather than a health-based need for removal.) In fact, unless all safeguards are properly applied by trained, experienced individuals, removing ACM can actually increase building occupants’ risk of asbestos-related disease.

### Background

#### The Asbestos Issue

Asbestos fibers can cause serious health problems. If inhaled, they can cause diseases which disrupt the normal functioning of the lungs. Three specific diseases—asbestosis (a fibrous scarring of the lungs), lung cancer, and mesothelioma (a cancer of the lining of the chest or abdominal cavity) —have been linked to asbestos exposure. These diseases do not develop immediately after inhalation of asbestos fibers; it may be 20 years or more before symptoms appear.

In general, as with cigarette smoking and the inhalation of tobacco smoke, the more asbestos fibers a person inhales, the greater the risk of developing an asbestos-related disease. Most of the cases of severe health problems resulting from asbestos exposure have been experienced by workers who held jobs in industries such as shipbuilding, mining, milling, and fabricating, where they were exposed to very high levels of asbestos in the air, without benefit of the worker protections now afforded by law. Many of these same workers were also smokers. These employees worked directly with asbestos materials on a regular basis and, generally for long periods of time as part of their jobs. Additionally, there is an increasing concern for the health and safety of construction, renovation, and building maintenance personnel, because of possible periodic exposure to elevated levels of asbestos fibers while performing their jobs.

Whenever we discuss the risk posed by asbestos, we must keep in mind that asbestos fibers can be found nearly everywhere in our environment (usually at very low levels). There is, at this time, insufficient information concerning health effects resulting from low-level asbestos exposure, either from exposures in buildings or from our environment. This makes it difficult to accurately assess the magnitude of cancer risk for building occupants, tenants, and building maintenance and custodial workers. Although in general the risk is likely to be negligible for occupants, health concerns remain, particularly for the building’s custodial and maintenance workers. Their jobs are likely to bring them into close proximity to ACM, and may sometimes require them to disturb the ACM in the performance of maintenance activities. For these workers in particular, a complete and effective O&M program can greatly reduce asbestos exposure. This kind of O&M program can also minimize asbestos exposures for other building occupants as well.

**What is Asbestos?**

The term “asbestos” describes six naturally occurring fibrous minerals found in certain types of rock formations. Of that general group, the minerals chrysotile, amosite, and crocidolite have been most commonly used in building products. When mined and processed, asbestos is typically separated into very thin fibers. When these fibers are present in the air, they are normally invisible to the naked eye. Asbestos fibers are commonly mixed during processing with a material which binds them together so that they can be used in many different products. Because these fibers are so small and light, they may remain in the air for many hours if they are released from ACM in a building. When fibers are released into the air they may be inhaled by people in the building.

Asbestos became a popular commercial product because it is strong, won’t burn, resists corrosion, and insulates well. In the United States, its commercial use began in the early 1900’s and peaked in the period from World War II into the 1970’s. Under the Clean Air Act of 1970 the EPA has been regulating many asbestos-containing materials which, by EPA definition, are materials with more than 1 percent asbestos. The Occupational Safety and Health Administration’s (OSHA) asbestos construction standard in section K, “Communication of hazards to employees,” specifies labeling many materials containing 0.1% or more asbestos. In the mid-1970’s several major kinds of asbestos materials, such as spray-applied insulation, fireproofing, and acoustical surfacing material, were banned by EPA because of growing concern about health effects, particularly cancer, associated with exposures to such materials.

In July 1989, EPA promulgated the Asbestos Ban and Phasedown Rule. The rule applies to new product manufacture, importation, and processing, and essentially bans almost all asbestos-containing products in the United States by 1997. This rule does not require removal of ACM currently in place in buildings.

**Where is Asbestos Likely to be Found in Buildings?**

In February 1988, the EPA released a report titled EPA Study of Asbestos-Containing Materials in Public Buildings: A Report to Congress. EPA found that “ friable” (easily crumbled) ACM can be
found in an estimated 700,000 public and commercial buildings. About 500,000 of those buildings are believed to contain at least some damaged asbestos, and some areas of significantly damaged ACM can be found in over half of them.

According to the EPA study significantly damaged ACM is found primarily in building areas not generally accessible to the public, such as boiler and machinery rooms, where asbestos exposures generally would be limited to service and maintenance workers. Friable ACM, if present in air plenums, can lead to distribution of the material throughout the building, thereby possibly exposing building occupants. ACM can also be found in other building locations.

Asbestos in buildings has been commonly used for thermal insulation, fireproofing, and in various building materials, such as floor coverings and ceiling tile, cement pipe and sheeting, granular and corrugated paper pipe wrap, and acoustical and decorative treatment for ceilings and walls. Typically it is found in pipe and boiler insulation and in spray-applied uses such as fireproofing or sound-deadening applications.

The amount of asbestos in these products varies widely (from approximately 1 percent to nearly 100 percent). The precise amount of asbestos in a product cannot always be accurately determined from labels or by asking the manufacturer. Nor can positive identification of asbestos be ascertained merely by visual examination. Instead, a qualified laboratory must analyze representative samples of the suspect material. Appendix G contains a sample list of some suspect materials.

**When is Asbestos a Problem?**

Intact and undisturbed asbestos materials do not pose a health risk. The mere presence of asbestos in a building does not mean that the health of building occupants is endangered. ACM which is in good condition, and is not somehow damaged or disturbed, is not likely to release asbestos fibers into the air. When ACM is properly managed, release of asbestos fibers into the air is prevented or minimized, and the risk of asbestos-related disease can be reduced to a negligible level.

However, asbestos materials can become hazardous when, due to damage, disturbance, or deterioration over time, they release fibers into building air. Under these conditions, when ACM is damaged or disturbed—for example, by maintenance repairs conducted without proper controls—elevated airborne asbestos concentrations can create a potential hazard for workers and other building occupants.
Chapter Summary

This document, directed to owners and managers of office buildings and similar facilities, should help lay the groundwork for developing and implementing effective operations and maintenance programs. Major highlights in this section have focused on background information concerning asbestos and have touched on the current asbestos-in-buildings situation. Important points to remember are the following:

- Inhalation of asbestos fibers has been shown to cause asbestosis, lung cancer and mesothelioma. Much of our knowledge of these health effects has come primarily from studies of workers exposed routinely to very high levels of asbestos in their jobs.

- Information on health effects of low-level asbestos exposure is less certain; custodial/maintenance workers who sometimes disturb asbestos as part of their job would benefit from properly executed O&M programs.

- Three of the six naturally occurring asbestos minerals, chrysotile, amosite, and crocidolite, have been most commonly used in building products.

- Asbestos became a popular commercial product because of its strength, heat resistance, corrosion resistance, and thermal insulation properties.

- Asbestos-containing materials (ACM) are regulated by EPA, OSHA, and the Consumer Product Safety Commission (CPSC), and individual state and local agencies.

- Friable ACM can be found in about 700,000 public and commercial buildings. Many areas where asbestos is found are not accessible to the general public.

- Some common uses of asbestos have included pipe/boiler insulation, spray-applied fireproofing, floor and ceiling tile, cement pipe/sheeting and paper pipe wrap.

- Positive identification of asbestos requires laboratory analysis; information on labels or visual examination only is not sufficient.

- Intact, undisturbed materials generally do not pose a health risk; they may become hazardous when damaged, disturbed, or deteriorated over time and release fibers into building air.
What Is an O&M Program?

Purpose and Scope of an Operations and Maintenance Program

Purpose of O&M

The principal objective of an O&M program is to minimize exposure of all building occupants to asbestos fibers. To accomplish this objective, an O&M program includes work practices to (1) maintain ACM in good condition, (2) ensure proper cleanup of asbestos fibers previously released, (3) prevent further release of asbestos fibers, and (4) monitor the condition of ACM.

Scope of an O&M Program

An effective O&M program should address all types of ACM present in a building. ACM that may be managed as part of an O&M program in buildings can be classified in one of the following categories:

1 **Surfacing Material**: Examples include ACM sprayed or troweled onto surfaces, such as decorative plaster on ceilings or acoustical ACM on the underside of concrete slabs or decking, or fireproofing materials on structural members.

2 **Thermal System Insulation (TSI)**: Examples include ACM applied to pipes, boilers, tanks, and ducts to prevent heat loss or gain, or condensation.

3 **Miscellaneous ACM**: Examples include asbestos-containing ceiling or floor tiles, textiles, and other components such as asbestos-cement panels, asbestos siding and roofing materials.

The O&M program can be divided into three types of projects:

- those which are unlikely to involve any direct contact with ACM;
- those which may cause accidental disturbance of ACM;
- those which involve relatively small disturbances of ACM.

The first type may involve routine cleaning of shelves and counter tops or other surfaces in a building (provided ACM debris is not present). Generally such

An example of spray-applied surfacing ACM on a metal deck above a suspended ceiling.
activities would not be expected to disturb ACM. The second type of project could include maintenance work above a Suspended Ceiling in an area that may have Surfacing ACM overhead. The third type of project—small Scale, short-duration maintenance, repair, or installation projects involving minor disturbances of ACM—includes activities such as installation of new light fixtures on or in an ACM ceiling. A single glovebag operation to remove a small amount of ACM to repair a pipe in a boiler room is another example of intentional small-scale, short-duration disturbance.

Larger projects involving more complex procedures for the intentional removal of ACM are considered asbestos abatement projects. These require asbestos control and abatement procedures that are outside the scope of an O&M program. Before taking action, building owners should consult qualified professionals for advice and alternative solutions. Guidance for building owners on the management of abatement projects is included in EPA’s “Guidance for Controlling Asbestos-Containing Materials in Buildings” June 1985, also known as the “Purple Book.”

**Chapter-Summary**

The purpose of an operations and Maintenance Program is to minimize exposure of all building occupants to asbestos fibers. Through supervised work practices, ACM can be managed in place. Important points to remember are:

ACM can be classified into three categories:
- Surfacing Material
- Thermal System Insulation (TSI)
- Miscellaneous Material

O&M Programs can be divided into three types of project:
- Unlikely to involve direct contact with ACM.
- Accidental disturbance of ACM.
- Small-scale, short-duration maintenance or repair activity which may involve intentional disturbance of ACM.
How Does the Program Start?
Laying the Foundation for an Effective O&M Program

A comprehensive asbestos control program for a building should include these basic steps:

- Appoint an Asbestos Program Manager and develop an organizational policy
- Conduct a physical and visual inspection of the building and take bulk samples of suspect materials to determine if ACM is present, establish an ACM inventory and assess the ACM’s condition and potential for disturbance.
- If ACM is located, develop an O&M program, based on the inspection and assessment data.
- Implement and manage the O&M program conscientiously
- Select and implement abatement actions other than O&M when necessary

This chapter provides information about each of these basic steps. In addition, see Appendix F for a chart of references outlining existing EPA guidance for each of these steps.

The Asbestos Program Manager

The position of Asbestos Program Manager (APM) is frequently held by the building engineer, superintendent, facilities manager, or safety and health director. In a small organization, the building owner may have this role. Regardless of who holds this position, EPA stresses the need for the Asbestos Program Manager to be properly qualified, through training and experience, and to be actively involved in all asbestos-control activities. EPA accreditation under the Asbestos Hazard Emergency Response Act (AHERA) or state certification as a Building Inspector/Management Planner would be typical of the requisite training.

If the person selected is not adequately prepared, he or she should receive the training necessary to develop and manage an asbestos control program prior to beginning the job. If for some reason this is not possible, the building owner should strongly consider hiring a properly trained, experienced, and credentialed outside consultant or firm to provide direction to the owner or the Asbestos Program Manager.

In general, the Asbestos Program Manager should have the authority to oversee all asbestos-related activities in the building, including inspections, O&M activities, and other abatement actions. The Asbestos Program Manager will either train building workers in O&M techniques or ensure that such worker training takes place. In addition, he or she should oversee the custodial and maintenance staffs, contractors, and outside service vendors with regard to all asbestos-related activities.

Building Inspection and Assessment

To determine whether an asbestos control and management program should be implemented, the owner should have an initial building inspection performed to locate and assess the condition of all ACM in the building. A trained, experienced, and qualified inspector, who is able to perform the sampling of suspect ACM for laboratory analysis, should conduct the inspection. If an inspection is not performed, then certain suspect materials should be assumed to contain asbestos, and treated accordingly (Refer to Appendix G for a sample list of suspect ACM.)

EPA guidance on how to take “bulk” samples of suspect ACM is contained in several publications (see Appendix H) and from EPA Regional Asbestos Coordinators (listed in Appendix D).

The building inspection by a qualified professional serves as the basis for establishing an effective overall plan for dealing with the asbestos in the building. The inspector should advise the owner and the Asbestos
A properly trained and protected building inspector collecting a bulk sample of suspected asbestos-containing thermal system insulation.

program Manager of inspection findings. Of course, the inspection may show that ACM is not present and that an asbestos-control program is not required.

If ACM is found, the material’s characteristics, condition, quantity and location within the building, as well as building use, will affect how the building owner should deal with the ACM. For example, operations and maintenance procedures may be appropriate and sufficient in a particular building for ACM in good condition. But O&M procedures alone are not sufficient for ACM that the inspector determines is significantly damaged, and may not be sufficient for some types of ACM situated in highly accessible areas; in these instances, some form of full scale abatement — repair, encapsulation, enclosure, encasement, or removal — will be necessary. Removal of the ACM may also be appropriate when performed in conjunction with major building renovations, or as part of long-term building management policies (such as staged removal in conjunction with renovation over the life of the building, as covered by the EPA NESHAP requirements for removal before demolition or renovation).

Developing an O&M Program

If ACM is found, the building owner should have an O&M program developed as soon as possible. Either the Asbestos Program Manager or a qualified consult-

ant should develop the O&M program. The written O&M program should state clearly the O&M policies and procedures for that building, identify and describe the administrative line of authority for that building, and should clearly define the responsibilities of key participants, such as the Asbestos Program Manager and custodial and maintenance supervisors and staff. The written O&M program should be available and understood by all participants involved in the management and operations of the building.

In general, the O&M program developed for a particular building should include the O&M program elements discussed in the next chapter. However, the building owner should make sure that the O&M program developed is site-specific and tailored for the building. The O&M program should take into account use, function, and design characteristics of a particular building.

Implementing and Managing an O&M Program

A well-developed O&M program is ineffective unless the building owner is committed to implementing it properly. The building owner should convey this commitment to key personnel involved in a building’s management and operations — particularly the Asbestos program Manager and custodial and maintenance supervisors and staff. The O&M program’s success is contingent upon key personnel understanding the O&M program and committing themselves to implementing it effectively.

To the greatest extent possible, the building owner should incorporate the O&M program into the existing system for managing a building’s operations. Each building owner, therefore, will determine the appropriate organizational structure on a case-by-case basis. Two possible arrangements are suggested in Figures 1 and 2 in Appendix C.

When managing an O&M program, the Asbestos Program Manager should oversee all asbestos-related activities. In instances where a building owner hires a contractor to perform custodial and maintenance work, the Asbestos Program Manager should ensure that the contractor is qualified to conduct work that may involve ACM. Before hiring a contractor, the Asbestos Program Manager should investigate to determine whether the contractor’s staff is qualified, trained and equipped to deal with O&M asbestos activities. Thoroughly checking the references of a contractor is a good recommended practice.

The Asbestos Program Manager should also monitor the work performed in the building by other contractors, such as electricians and plumbers, who might inadvertently disturb ACM. Instituting a work permit system, as discussed in the next chapter, may prevent accidental disturbances of ACM. Under this system, a
contractor must receive a work permit from the Asbestos Program Manager before commencing work. At that time, the Asbestos Program Manager will inform the contractor whether the project could disturb ACM and provide any special instructions to make sure the work is done properly. Communication between the Asbestos Program Manager and tenants occupying the building is essential to prevent activities that might compromise the O&M program.

In addition, the Asbestos Program Manager should routinely and frequently check the work being performed in the building by contractors and custodial and maintenance staff to see if their work is disturbing ACM. By maintaining close surveillance over these activities, the Asbestos Program Manager can help ensure that work which may disturb ACM is being done safely. Tenants should be required (by legal agreement or understanding) to notify the building owner or the Asbestos Program Manager before conducting even small planned renovations. This would help prevent building tenants from unknowingly disturbing ACM. For both the work permit system and the renovation notification requirement, clear and effective communications to workers and tenants are crucial to the success of the O&M management program.

The Asbestos Program Manager should periodically review the written O&M plan to determine whether it should be updated. For example, if all ACM were removed from some areas of the building during a recent renovation, or if some ACM was damaged, the O&M program should be revised accordingly. The O&M program should remain in effect as long as ACM is present in the building.

Cost Considerations

The costs associated with implementing and managing an O&M program may vary significantly depending on the types of ACM, building-specific factors, actual O&M procedures adopted, types of equipment used, and the useful life of the building. Owners may find it more cost-effective to continue a well-supervised and managed O&M program than to incur the costs of immediate, large-scale removal. In addition to the direct costs of removal, other costs related to ACM removal include moving building occupants, arranging alternative space for building occupants during the removal work, and restoring the building after the removal is completed.

Clearly many factors enter into the decision. Only by conducting a cost-effectiveness analysis of the long-term options (e.g., comparing (a) immediate removal with (b) phased removal plus O&M with (c) removal just before demolition plus lifetime O&M) will owners be truly able to determine which option is most cost-effective for their buildings. The prudent owner may need to consult one or more qualified consultants or firms for advice, if such expertise does not exist within the owner’s organization.

Selecting and Implementing Alternative Abatement Actions

In some instances, due to the condition of ACM or upcoming building renovations, a building owner may decide to take other abatement actions to deal with ACM in the building. These response actions could include encapsulation (covering the ACM with a sealant to prevent fiber release), enclosure (placing an air-tight barrier around the ACM), encasement (covering the ACM with a hard-setting sealing material), repair, or removal of the ACM. Qualified, trained, and experienced contractors should be used for any of these actions. EPA’s Purple Book discusses most of these alternatives in some detail. In general, repair, encapsulation, enclosure, and encasement, are intended to help prevent the release of asbestos fibers. As aspects of O&M, these techniques manage ACM in place. See Appendix F of this document for additional federal reference sources on asbestos response actions.

When determining which response alternative to select, the building owner and Asbestos Program Manager may consider seeking advice from qualified, independent consultants with specific training and experience in asbestos management.

Asbestos consultants should have a background in engineering, architecture, industrial hygiene, safety, or a similar field. Experts who are Registered and/or with Board Certified backgrounds are recommended. To help ensure that no “conflict of interest” exists, consultants should not be affiliated with the abatement contractors who may be used on a recommended ACM control project, nor with analytical laboratories which perform sample analyses. As with other similar business decisions, building owners should interview several consultants and check references.

Renovations (including remodeling or redecorating) of buildings or replacement of utility systems increase the potential for disturbing ACM. Before conducting any renovation or remodeling work, the building owner should have the Asbestos Program Manager review asbestos inspection and assessment records to determine where ACM may be located, visually reinspect the area, and evaluate the likelihood that ACM will be disturbed. Any suspect or assumed ACM that could be disturbed during the renovation work should either be sampled and analyzed to determine whether it contains asbestos, or the work should be carried out as if the materials did contain asbestos. The Asbestos Program Manager should also ensure that no new ACM is introduced into the building as part of the renovation work.

Removal of the ACM before renovation begins maybe necessary in some instances. Removal is required by the Asbestos NESHAP regulations for projects which would break up more than a specified minimum amount of ACM; specifically at least 160 square feet of surfacing...
Asbestos-containing thermal system insulation which has sustained significant damage in a mechanical/boiler room of a building.

or miscellaneous material or at least 260 linear feet of thermal system insulation (40 CFR 61.145-147). Building owners and managers are encouraged to contact their state or local health or environmental department for further clarification of these requirements (also, see Chapter 6 of this document). It is important to ensure that new materials placed in the building do not contain asbestos in order to comply with the recent EPA Asbestos Ban and Phase Out rule (see Chapter 6).

In general, building owners should thoroughly consider any decision to remove ACM. O&M, encapsulation, encasement, enclosure, or repair may be viable alternatives to removal. Building owners should assess these in-place management techniques carefully before deciding to remove undamaged ACM.

Under certain circumstances, however, such as when some ACM must be removed during building renovations, when the ACM has sustained a great deal of damage, or ACM disturbance will be difficult to manage properly the building owner may decide to remove ACM in parts of the building.

When removal must occur, only qualified, trained and experienced project designers and contractors should be permitted to design and perform the work. Building owners might consider contacting local, state, and federal asbestos regulatory agencies to see if prospective contractors have received citations for violating asbestos regulations in the past. In addition, if the building owner and Asbestos Program Manager are not properly qualified themselves, they should retain a qualified and independent project designer and a project monitor with training and experience in asbestos abatement to oversee and ensure that the asbestos abatement work is done safely. When these precautions are taken, asbestos removal is more likely to proceed safely and effectively.

Proper completion of the ACM removal is best evaluated by means of the analytical procedures using transmission electron microscopy (TEM). (These are described in 40 CFR Part 763, Appendix A to Subpart E.) Clearance protocols for statistically comparing asbestos fiber levels inside the work area with outside levels are available. If the measured levels inside are not statistically higher than the average airborne asbestos concentration measured outside the abatement area, the cleanup is considered successful, and the space is judged ready for reoccupancy. (For reference, see Appendix H, U.S. EPA "Guidelines for Conducting the AHERA TEM Clearance Test . . . ")
# Chapter Summary

Laying the foundation for a comprehensive asbestos control program for a building includes some basic steps. Important points contained in this discussion are the following:

<table>
<thead>
<tr>
<th>An Asbestos Program Manager needs to be properly qualified through training and experience, and be actively involved in all asbestos control and disturbance activities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Asbestos program Manager should have authority to oversee and to direct custodial/maintenance staff and contractors with regard to all asbestos-related activities.</td>
</tr>
<tr>
<td>An initial building inspection should be performed by a trained, qualified, experienced inspector to locate and assess the condition of all ACM in the building.</td>
</tr>
<tr>
<td>The inspection results serve as the basis for establishing an O&amp;M program. O&amp;M procedures may not be sufficient for certain ACM that is significantly damaged or in highly accessible areas.</td>
</tr>
<tr>
<td>An Asbestos Program Manager or qualified consultant should develop the written O&amp;M program that is site-specific and tailored for individual buildings. The O&amp;M program should take into account use, function and design characteristics of a building.</td>
</tr>
<tr>
<td>The success of any O&amp;M program lies in the commitment by the building owner to implement it properly.</td>
</tr>
<tr>
<td>When outside contractors are used for asbestos-related activities, their references and training should be thoroughly checked and their subsequent work monitored.</td>
</tr>
<tr>
<td>Periodically review written O&amp;M programs.</td>
</tr>
</tbody>
</table>

Alternatives or control options that may be implemented under an O&M program include:

- repair
- encapsulation
- enclosure
- encasement
- removal (minor)

Removal of ACM before renovations may be necessary in some instances. (See NESHAP and State/Local regulations discussion in Chapter 6.)
What Does an O&M Program Include?

O&M Program Elements

To achieve its objectives, an O&M program should include seven elements. Although these should appear in any O&M program, the extent of each will vary from program to program depending on the building type, the type of ACM present, and the ACM’s location and physical condition. For example, if only nonfriable ACM is present, minimal notification might be needed, and custodial or maintenance staff would most likely have fewer work practices to be followed. If friable ACM is present, a more detailed O&M program should be prepared and followed. Each of the first six elements listed below is described in this chapter to provide an illustration of a basic O&M program. The seventh program element, training of the Asbestos Program Manager and custodial and maintenance staff, is very important. If staff are not adequately trained, the O&M program will not be effective. Chapter 5 is devoted exclusively to O&M training topics.

A successful O&M program should include the following elements:

- **Notification:** A program to tell workers, tenants, and building occupants where ACM is located, and how and why to avoid disturbing the ACM. All persons affected should be properly informed.

- **Surveillance:** Regular ACM surveillance to note, assess, and document any changes in the ACM’s condition.

- **Controls:** Work control/permit system to control activities which might disturb ACM.

- **Work Practices:** O&M work practices to avoid or minimize fiber release during activities affecting ACM.

- **Recordkeeping:** To document O&M activities.

- **Worker Protection:** Medical and respiratory protection programs, as applicable.

- **Training:** Asbestos Program Manager, and custodial and maintenance staff training.

Informing Building Workers, Tenants, and Other Occupants

Building owners should inform building workers, occupants, and tenants about the location and physical condition of the ACM that they might disturb, and stress the need to avoid disturbing the material. Occupants should be notified for two reasons: (1) building occupants should be informed of any potential hazard in their vicinity; and (2) informed persons are less likely to unknowingly disturb the material and cause fibers to be released into the air.

Building owners can inform occupants about the presence of ACM by distributing written notices, posting signs or labels in a central location where affected occupants can see them, and holding awareness or information sessions. The methods used may depend on the type and location of the ACM, and on the number of people affected. Some states and localities have “right-to-know” laws which may require that all occupants, workers, and visitors in buildings with ACM be informed that asbestos is present.

In service and maintenance areas (such as boiler rooms), signs such as “Caution — Asbestos — Do Not Disturb” placed directly adjacent to thermal system insulation ACM will alert and remind maintenance
workers not to inadvertently disturb the ACM. In most cases, all boilers, pipes, and other equipment with ACM in service areas where damage may occur should have prominent warning signs placed next to the ACM. As an alternative, color coding can be used to identify the ACM in certain situations provided that all potentially involved parties understand the coding system.

Information sessions reinforce and clarify written notices and signs, and provide an opportunity to answer questions. All employees and tenants or tenant representatives likely to disturb ACM should be included in the notification program on a continuing basis. Owners should provide additional signs and information sessions in languages other than English where a significant number of workers, occupants, or visitors do not speak English. It may be necessary to make special provisions for illiterate workers, such as providing clear verbal information or signs, about potential hazards of disturbing ACM, and showing them where ACM is located.

The specific information given to types of building occupants will vary. For example, since service workers carry out certain tasks that office workers or tenants do not perform, they should receive additional information. Most important, O&M workers should receive the training necessary for them to perform their tasks safely.

Whatever its form, the information given to building occupants and workers should contain the following points to the extent they reflect building conditions:

- ACM has been found in the building and is located in areas where the material could be disturbed.
- The condition of the ACM, and the response which is appropriate for that condition.
- Asbestos only presents a health hazard when fibers become airborne and are inhaled. The mere presence of ACM does not represent a health hazard.
- The ACM is found in the following locations (e.g., ceilings in Rooms 101 and G-323, walls in the lobby, above suspended ceilings in the first floor corridor, on columns in the main entry on pipes in the boiler room).
- Do not disturb the ACM (e.g., do not push furniture against the ACM, do not damage TSI).
- Report any evidence of disturbance or damage of ACM to (name, location, and phone number of Asbestos Program Manager).

It is important to undertake an honest and open approach to the ACM notification procedure. Owners should strive to establish clear lines of communication with all building occupants regarding asbestos issues. People who are informed of the presence, location and condition of ACM in a building where they work or live, who understand that the mere presence of ACM is not necessarily hazardous to them, and who accept that ACM can often be managed effectively in place, can be protected the health of building occupants.

- Report any dust or debris that might come from the ACM or suspect ACM, any change in the condition of the ACM, or any improper action (relative to ACM) of building personnel to (name, location, and phone number of Asbestos Program Manager).
- Cleaning and maintenance personnel are taking special precautions during their work to properly clean up any asbestos debris and to guard against disturbing ACM.
- All ACM is inspected periodically and additional measures will be taken if needed to protect the health of building occupants.

Routine maintenance activities can cause disturbance of ACM if workers are not properly trained in operations and maintenance procedures. Here, a worker carelessly contacts ACM, possibly damaging it.
According to recent EPA regulations covering schools (the Asbestos Hazard Emergency Response Act, “AHERA”), an accredited inspector must reinspect school buildings at least once every three years to reassess the condition of ACM. The AHERA regulations for schools also require a routine surveillance check of ACM every six months to monitor the ACM’s condition. The AHERA Rule permits this surveillance to be conducted by a trained school custodian or maintenance worker. While these intervals are mentioned here as a guide, they may also be appropriate for other buildings. The Asbestos Program Manager should establish appropriate intervals, based on consultation with the building owner and any other qualified professionals involved in the O&M program.

EPA recommends a visual and physical evaluation of ACM during the reinspection to note the ACM’s current condition and physical characteristics. Through this reinspection, it is possible to determine both the relative degree of damage and assess the likelihood of future fiber release. Maintenance of a set of visual records (photos or videotape) of the ACM overtime can be of great value during reinspection.

Some asbestos consultants recommend examining settled dust for accumulations of asbestos fibers as another surveillance tool in an O&M program. While no universally accepted standardized protocols currently exist for sampling and analysis of settled dust, positive results (i.e., ACM is present in the dust) may indicate the need for special cleaning of the affected area, or other action. Because the results of this testing are difficult to interpret and evaluate at this time, building owners should carefully consider the appropriateness of this testing to their situation.

As part of an O&M program, a carefully designed air monitoring program to detect airborne asbestos fibers in the building may provide useful supplemental information when conducted along with a comprehensive visual and physical ACM inspection and reinspection program. If the ACM is currently in good condition, increases in airborne asbestos fiber levels at some later time may provide an early warning of deterioration or disturbance of the material. In that way, supplemental air monitoring can be a useful management tool. If an owner chooses to use air monitoring in an “early warning” context, a knowledgeable and experienced individual should be consulted to design a proper sampling strategy Appendix H contains a reference to a useful guide to monitoring airborne asbestos, which can be consulted for further discussion of this subject.

If supplemental air monitoring is done, a baseline airborne asbestos fiber level should be established soon after the O&M program is initiated Representative, multiple air samples should be collected throughout the building during periods of normal building operation. This should be done over along enough period of time to be representative of existing conditions, in order to adequately characterize prevailing fiber levels in the building. This air monitoring should supplement, not replace, physical and visual inspection. Visual inspection can recognize situations and anticipate future exposure (e.g., worsening water damage), whereas air monitoring can only detect a problem after it has occurred, and fibers have been released.

Note that the collection of air samples for supplementary evaluation should not use aggressive air sampling methods. Aggressive sampling methods, in which air is deliberately disturbed or agitated by use of a leaf blower or fans, should be used at the completion of an asbestos removal project when the building or area is unoc-
The most accurate and preferred method of analysis of air samples collected under an O&M program would require the use of transmission electron microscopy (TEM). Phase contrast microscopy (PCM), which is commonly used for personal air sample analysis and as a screening tool for area air monitoring, cannot distinguish between asbestos fibers and other kinds of fibers which may be present in the air. PCM analysis also cannot detect thin asbestos fibers, and does not count short fibers. TEM analysis is approximately ten times more expensive than PCM analysis. However, the more accurate information on actual levels of airborne asbestos fibers should be more beneficial to the building owner who elects to use supplemental air monitoring in the asbestos management program. TEM analysis is most reliably performed by laboratories accredited by the National Institute for Standards and Technology (NIST; see Appendix D for telephone number), and who follow EPA's quality assurance guidelines. (Appendix H, U.S. EPA, Dec. 1989, “Transmission Electron Microscopy Asbestos Laboratories: Quality Assurance Guidelines.”)

Selection of a reliable and experienced air monitoring firm and analytical laboratory is important, if the building owner elects to conduct supplemental air monitoring under the O&M program. A consultant knowledgeable in air sampling and analysis protocols can be contacted for recommendations if the building owner or Asbestos Program Manager has limited knowledge in this area.

Periodic air monitoring, conducted simultaneously with the visual reinspection or surveillance, would then be used to see if asbestos levels have changed relative to the baseline. Some building owners may wish to present current air monitoring results to building occupants in addition to information regarding the physical reinspections. Although this supplemental use of air monitoring as part of an O&M program may provide useful information, it is likely to be very expensive, particularly if the more accurate and recommended TEM analysis is used. Use of only a small number of measurements or measurements taken only at one time may be misleading (i.e., overestimate or underestimate of fiber levels), and can lead to inappropriate decisions.

It should be noted that some of the exposures of persons to airborne asbestos fibers in buildings may result from episodic events, such as repair work or the accidental disturbance of the ACM or of ACM debris by maintenance activities inside the building. Air monitoring may not be done frequently enough to include such episodic events; this can lead to a misleading interpretation of air sampling results. In particular, air sampling may underestimate the exposure of O&M workers and building occupants. A good reference sourcebook for additional information on air sampling and analysis for asbestos fibers is “A Guide to Monitoring Airborne Asbestos in Buildings” (see Appendix H).

### Work Control/Permit System

The O&M program should include a system to control all work that could disturb ACM. Some building owners have had success using a “work permit” program, which requires the person requesting the work to submit a Job Request Form to the Asbestos program Manager (Appendix B, Form 2) before any maintenance work is begun. The form gives the time and location of the requested work, the type of maintenance needed, and available information about any ACM in the vicinity of the requested work. The contractor or other person authorized to perform the work should be identified on the work request.

Upon receiving a pre-work Job Request Form, the Asbestos Program Manager should take the following steps:

1. Refer to written records, building plans and specifications, and any building ACM inspection reports to determine whether ACM is present in the area where work will occur. If ACM is present, but it is not anticipated that the material will be disturbed, the Asbestos Program Manager should note the presence of the ACM on the permit form and provide additional instruction on the importance of not disturbing the ACM.

2. If ACM is both present and likely to be disturbed, the Asbestos Program Manager or a designated supervisor qualified by training or experience, should visit the site and determine what work practices should be instituted to minimize the release of asbestos fibers during the maintenance activity.

3. This determination should be recorded on the Maintenance Work Authorization Form (see example in Appendix B, Form 3), which is then sent to the in-house maintenance supervisor or to the maintenance contractor to authorize the work.

4. The Asbestos Program Manager should make sure that a copy of both the request and the authorization forms (if granted) are placed in the permanent file.

An example of a maintenance worker conducting activities near a friable asbestos-containing ceiling. Under a proper permitting system, the building Asbestos Program Manager would evaluate and authorize projects such as this prior to beginning work.
Where the task is not covered by previously approved standard work practices, the Asbestos Program Manager should make sure that the appropriate work practices and protective measures are used for the job.

For all jobs where contact with ACM is likely the Asbestos Program Manager or a designated supervisor qualified by training or experience should visit the work site when the work begins to see that the job is being performed properly. For lengthy jobs where disturbance of ACM is intended or likely, periodic inspections should be made for the duration of the project.

The Asbestos Program Manager’s observations should be provided on an Evaluation of Work Form (see Appendix B, Form 4). Any deviation from standard and approved work practices should be recorded immediately on this form and the practices should be immediately corrected and reported to the Asbestos Program Manager.

Upon completion of the work, a copy of the evaluation form should be placed in the permanent asbestos file for the building.

Building owners should consider using asbestos O&M work control forms similar to those which already may be in use for non-ACM work in their facilities, or expanding the existing forms to include the content of the request, approval, and evaluation forms illustrated in Appendix B.

The O&M management system should also address work conducted by outside contractors. Many building owners contract for at least some custodial and maintenance services. A building’s asbestos work control/permit system, as described above, should also cover contract work.

At a minimum, contracts with service trades or abatement companies should include the following provisions to ensure that the service or abatement workers can and will follow appropriate work practices:

- Proof that the contractor’s workers have been properly notified about ACM in the owner’s building and that they are properly trained and accredited (if necessary) to work with ACM.

- Copies of respiratory protection, medical surveillance, and worker training documentation as required by OSHA, EPA and/or state regulatory agencies.

- Notification to building tenants and visitors that abatement activity is underway (performed by owner).

Written work practices must be submitted by the vendor or contractor for approval or modification by the Asbestos Program Manager. The vendor or contractor should then agree to abide by the work practices as finally accepted by the Asbestos Program Manager.

Assurance that the contractor will use proper work area isolation techniques, proper equipment, and sound waste disposal practices.

Historical air monitoring data for representative examples of the contractor’s previous projects, with emphasis on projects similar to those likely to be encountered in the building.

Provisions for inspections of the area by the owner’s representative to ensure that the area is acceptable for re-entry of occupants/tenants.

A resume for each abatement contractor/supervisor or maintenance crew chief, known as the “competent person” in the OSHA standard and EPA Worker Protection Rule.

Criteria to be used for determining successful completion of the work (i.e., visual inspections and air monitoring).

Any other information deemed necessary by the owner’s legal counsel.

Notification to EPA (and other appropriate agencies) if the abatement project is large enough (see Chapter 6).

O&M Work Practices

- The O&M program focuses on a special set of work practices for the custodial, maintenance, and construction staff. The nature and extent of any special work practices should be tailored to the likelihood that the ACM will be disturbed and that fibers will be released. In general, four broad categories of O&M work practices are recognized

1 Worker Protection Programs – These work practices help ensure custodial and maintenance staff are adequately protected from asbestos exposure.

2 Basic O&M Procedures – Basic procedures are used to perform routine custodial and maintenance tasks that may involve ACM.

3 Special O&M Cleaning Techniques – Special techniques to cleanup asbestos fibers on a routine basis.
Procedures for Asbestos Fiber Release Episodes – If moderate to relatively large amounts of ACM are disturbed, the building owner should use these procedures to address the hazard.

A brief synopsis of worker protection and O&M work practices follows. (Note: A more detailed, technically oriented O&M “work practices” manual specifically addressing topics such as work practices, worker protection, and specific information on how to carry out O&M plans, is being developed, with publication expected in 1991.)

Worker Protection Programs

A worker protection program includes engineering controls, personal exposure monitoring, medical surveillance, and personal protection. While engineering controls are the preferred method of worker protection, there are few engineering control options available for O&M work. This section discusses two key aspects of personal protection: use of respiratory protection and protective clothing for workers in an asbestos O&M program. According to OSHA regulations (see Chapter 6), a written respiratory protection program is necessary whenever an O&M program specifies that service workers wear respirators, or where respirators are made available to employees. OSHA regulations also require a respirator program whenever workers are exposed, or are likely to be exposed, to fiber levels above OSHA’s “permissible exposure limits” such as the 8-hour time weighted average (TWA) limit or the 30-minute “excursion limit” (EL). The 8-hour TWA limit and the EL are described in more detail in Chapter 6. In addition, OSHA requires workers to wear special protective clothing under the same circumstances.

Respiratory Protection/Worker Protection Programs

The selection of approved respirators, suitable for the hazards to which the worker is exposed, is only one aspect of a complete respiratory protection program. Other elements include written operating procedures for respirator use; outlining personnel responsibilities for respirator cleaning, storage, and repair; medical examination of workers for respirator use; training in proper respirator use and limitations; respirator fit testing respirator cleaning and care; and work-site supervision. All of these are described in detail in the OSHA respirator standard, 29 CFR 1910.134. The O&M respirator program can be administered by the facility safety and health manager or the Asbestos Program Manager, if properly qualified.

Proper respiratory protection is an integral part of all custodial and maintenance activities involving potential exposure to asbestos. When in doubt about exposure during a certain work operation, building owners should provide respiratory protection to custodial and maintenance workers. OSHA specifies general types of respirators for protection against airborne asbestos during “construction” activities, which include abatement, renovation, maintenance, repair, and remodeling.

Personal air sampling is not the same as area air monitoring. Personal air sampling (required by OSHA) is designed to measure an individual worker’s exposure to fibers while the worker is conducting tasks that may disturb ACM. The sampling device is worn by the worker and positioned so that it samples air in the worker’s breathing zone. In contrast, area (or ambient) air sampling is conducted to get an estimate of the numbers of airborne asbestos fibers present in a building. It is used as an assessment tool in evaluating the potential hazard posed by asbestos to all building occupants. (See the previous discussion of area air monitoring on page 14.)

When adequate care is taken to prevent or minimize and control fiber release, routine, small-scale/short-duration maintenance or custodial tasks are not likely to generate high levels of airborne asbestos compared to large asbestos removal projects; and respirators which filter breathing air may be used. OSHA, EPA, and NIOSH are on record as not recommending single use, disposable paper dust masks for use against asbestos; in fact, OSHA has disallowed their use against airborne asbestos fibers.

The options that may be used include:

- A half-face or full facepiece, negative pressure, air-purifying respirator with replaceable high-efficiency filters.
A half or full facepiece powered air-purifying respirator (PAPR) with replaceable high-efficiency filters. This has a battery powered pump which assists breathing and provides positive pressure in the facepiece.

Under the OSHA standards for asbestos, any employee required to wear a negative pressure respirator can request a powered air-purifying respirator, and the employer is required to provide a fully functional and approved unit, provided it will afford the worker at least equal protection.

Currently only respirators approved by NIOSH and the Mine Safety and Health Administration (MSHA) are permitted for use. If they are air-purifying respirators, the filtration device(s) must be rated as “high-efficiency”

Selecting the most appropriate respirator for each O&M task requires knowledge of the levels of airborne asbestos fibers and other possible air contaminants generated by the task or likely to be present where the task is performed. This knowledge is best gained through personal air monitoring conducted during worker performance of the actual task. (Obviously the workers must have respiratory protection while this initial personal air sampling is carried out.) In fact, OSHA and EPA require air monitoring under certain circumstances (see Chapter 6). To learn more about the different types of respirators available and the degree of protection they provide, see Appendix E. Owners may also wish to contact the nearest OSHA office, a local trained and certified industrial hygienist (preferably Certified), or an occupational health professional for more information on respirators. The expertise of these specialists should be used to ensure proper selection, fit testing, and training of workers in respirator use.

Pictured above are two different types of powered air-purifying respirators (PAPRs) equipped with high-efficiency filters. On the left is an example of a tight fitting, full facepiece PAPR, and on the right is an example of a loose-fitting helmet style PAPR.

Building owners and other facility managers may not be familiar with some of the terms used in discussions of respirators, airborne fiber levels, and related topics.

Appendix E contains more information on these topics, and gives the minimum EPA-recommended levels of respiratory protection to be provided during typical O&M tasks.

For additional information on respirator programs, respirator types, and respirator use, the building owner or Asbestos Program Manager may want to use the following references

- “Respiratory Protection An Employer’s Manual,” NIOSH, October 1978;
- OSHA respirator standard (29 CFR 1910.134);
- OSHA asbestos regulations (29 CFR 1910.1001 and 1926.58);
- “Respirator Decision Logic,” NIOSH, May 1987; and

Protective Clothing/Worker Protection Programs In addition to the use of respirators, some O&M procedures may require workers to wear protective clothing. Most often, protective clothing is disposable and consists of coveralls, a head cover, and foot covers made of a synthetic fabric which does not allow asbestos fibers to pass through. This type of clothing prevents workers’ regular clothing from becoming contaminated with asbestos fibers. Contaminated clothing could be taken home, creating a possible risk to the worker’s family members.

OSHA and EPA regulations require workers to wear protective clothing whenever they are exposed, or likely to be exposed, to fiber levels above OSHA’s permissible levels (see Chapter 6). It is important that workers be properly trained in the use, removal and disposal of protective clothing after use. All O&M activities may not require the use of protective clothing. It is important for the Asbestos Program Manager to assess this need on a case-by-case basis.

Basic O&M Procedures Basic O&M procedures to minimize and/or contain asbestos fibers may include wet methods, use of mini-enclosures, use of portable power tools equipped with special local ventilation attachments, and avoidance of certain activities, such as sawing, sanding,
and drilling ACM. Maintenance activities can be divided into three categories with regard to their potential for disturbing ACM:

1. Those which are unlikely to involve any direct disturbance of ACM; for example, cleaning shelves or counter tops with a damp cloth.

2. Those which may cause accidental disturbance of ACM; for example, working on a fixture near a ceiling with surfacing ACM.

3. Those which involve intentional small-scale manipulation or disturbance of ACM; for example, removing a small segment of TSI ACM to repair a pipe leak.

The O&M program should include work practices for each type of ACM that is present in the building (surfacing, TSI, and miscellaneous) as well as for each type and category of maintenance activity performed (e.g., general cleaning, electrical work, plumbing).

Special work practices such as wet wiping, area isolation, and HEPA vacuuming, and the use of personal protective equipment such as respirators and protective clothing, may be needed where disturbance of ACM is likely. The need for these practices varies with the situation. For example, removing light fixtures located near surfacing ACM may disturb the material and might involve the use of special cleaning, possibly area isolation, and respiratory protection. Periodic emptying of a trash can near heavily encapsulated asbestos-containing plaster may not disturb the material at all, so no special work practices would generally be necessary. These work practices and procedures are intended to ensure that disturbance of any ACM during O&M activities should be minimized, or carried out under controlled conditions when the disturbance is required by the nature of a specific O&M task.

In addition, ACM may readily release asbestos fibers into the air when certain mechanical operations are performed directly on it. For example, fiber releases can occur when workers are drilling, cutting, sanding, breaking, or sawing vinyl asbestos floor tile.

The action of drilling, cutting, abrading, sanding, chipping, breaking, or sawing is the critical factor here, since it is likely to cause a release of fibers. Maintenance or repair operations involving those actions should be eliminated or carefully controlled with basic O&M procedures in order to prevent or minimize asbestos fiber release.

Certain activities that occur in the vicinity of ACM can also cause damage which may result in asbestos fiber release. For example, maintenance and custodial stroll may damage ACM accidentally with broom handles, ladders, and fork lifts while performing other tasks. Activities performed in the vicinity of ACM should always be performed cautiously to prevent fiber release.

To summarize, if in doubt about the possibility of disturbing ACM during maintenance activities, adequate precautions should be taken to minimize fiber release; these will protect workers as well as the building environment. Basic O&M procedures, including use of wet methods and specially equipped tools, should be used to protect building occupants.

O&M Cleaning Practices

Special cleaning practices are appropriate for a building with exposed surfacing or thermal system insulation ACM, especially if the ACM is friable. If gradual deterioration or damage of ACM has occurred or is occurring, asbestos-containing dust or debris could be present. If the building inspection has determined that asbestos-containing dust or debris is present in some areas, then the O&M program should include special cleaning practices to collect residual asbestos dust. Routinely cleaning floors using wet methods is an example of one such practice. Custodial and maintenance workers in the course of normal work can also identify and report areas which are in need of special cleaning or repair. Special cleaning techniques should supplement, not replace, repair or abatement actions for damaged, friable ACM. The cleaning program should include an initial cleaning followed, as needed, by subsequent periodic or episodic cleanings.

Building owners and custodial and maintenance staff should ensure that special O&M cleaning is done correctly. Proper cleaning is important for two reasons:

- The use of improper techniques to clean up asbestos debris caused by previous deterioration or damage may result in widespread contamination, and potentially increase airborne asbestos fiber levels in the building.

- Improper cleaning may cause damage to the ACM, thus releasing more airborne asbestos fibers.

O&M cleaning will involve the use of wet cleaning or wet-wiping practices to pick up asbestos fibers. Dry sweeping or dusting can result in asbestos fibers being re-suspended into the building’s air and therefore should not be used. Once wet cloths, rags, or mops have been used to pickup asbestos fibers, they should be properly discarded as asbestos waste while still wet. They should not be allowed to dry out, since the collected fibers might be released at some later time when disturbed. The use of special vacuum cleaners, commonly referred to as HEPA vacuums, may be preferable to wet cleaning in certain situations. These vacuums are equipped with filters designed to remove very small particles or fibers — such as asbestos — by filtering those particles from the air passing through the vacuum. Since the exhaust air from an ordinary vacuum cleaner is not filtered sufficiently it is possible for tiny asbestos fibers to pass through the filter and back into the building air.
Special procedures are generally needed to minimize the spread of fibers in the building after asbestos fiber release occurs.

It is important for O&M workers to use caution when emptying HEPA vacuums and changing the filters. Exposures could result from such activities. Workers should move the HEPA vacuum to a physically isolated area of the facility and put on proper personal protective equipment before emptying the dust and debris into properly labeled, sealed, and leak-tight containers for disposal as asbestos-containing waste. When custodial workers do not work with ACM, trained maintenance workers can be used to empty the HEPA vacuums and change their filters. Decisions regarding special cleaning practices should be based on the building inspection and ACM assessment data, including the potential for ACM disturbance. In general, the building would not need special O&M cleaning when the building contains only nonfriable (not easily crumbled) ACM; ACM which has been encapsulated, encased, or enclosed behind airtight barriers; or ACM known to be undamaged/undisturbed since the last special cleaning. Furthermore, where ACM is confined to a single room or area, special cleaning of just that area rather than other parts of the building may be sufficient.

If ACM has been released onto a carpeted area of a building, it may not always be possible to adequately clean the carpeted area. “Steam” cleaning and HEPA vacuuming methods are sometimes employed for this purpose. A preliminary study carried out by EPA in 1989 showed that hot water vacuums were more effective in carpet cleaning than HEPA vacuums, under the test conditions. Further field studies are planned to confirm these findings.

For carpets, successful cleaning will likely depend on factors such as the amount of ACM released onto the carpet, how long the situation has existed, traffic over the area, as well as the structure and composition of the carpet itself. It is prudent to evaluate individual situations on a case-by-case basis. The Asbestos program Manager should consider the need for workers engaged in cleaning asbestos fiber-contaminated carpets to wear proper respiratory protection. It may also be prudent to arrange for this type of cleaning to be done after normal working hours or when the facility is less occupied. Additionally it may be more cost effective to properly dispose of contaminated carpets and other fabrics as asbestos-containing waste if a permanent asbestos control option is being undertaken in the building.

Where the ACM is damaged and located in an “air plenum” – where fibers can be transported by the heating, ventilation, or air conditioning (HVAC) system throughout the building – special cleaning practices may be extended to the entire building, including the HVAC system itself.

Procedures for Asbestos Fiber Release Episodes

Special procedures are generally needed to minimize the spread of fibers throughout the building after asbestos fiber releases occur, such as the partial collapse of an ACM ceiling or wall. These procedures are needed whether the ACM disturbance is intentional or unintentional. To provide building owners with some guidance, under EPA regulations for schools a “major fiber release” is defined as one involving more than three square or linear feet of ACM. The procedures to be followed will vary according to the site of the major release episode, the amount of ACM affected, the extent of fiber release from the ACM, the relationship of the release area to the air handling systems, and whether the release site is accessible to building occupants. Depending on the severity of the episode, asbestos abatement consultants and contractors may be needed to develop a strategy for conducting the clean-up operations.

In general, for major fiber releases, the area should be isolated by closing doors and/or erecting temporary barriers to restrict airflow as well as access to the site. Signs should be posted as necessary immediately outside the fiber release site to prevent persons not involved in the cleanup operation from inadvertently entering the area. If asbestos fibers could enter the HVAC system, the system should be modified to prevent fiber entry, or should be shut down and sealed off. The final step should be to employ thorough cleanup procedures to properly control the ACM, a careful visual inspection, and final clearance air monitoring to verify satisfactory cleanup.

Similar procedures can be used for much smaller fiber release events: where the amount of ACM is on the
order of three square or linear feet or less. The HEPA vacuuming, wet wiping, and worker protection procedures outlined in this guidance document, as well as wetting ACM wastes and properly placing them in an appropriate leak-tight container (such as a properly labeled, 6-mil-thick plastic bag), are examples of some of the procedures which could be used for both major and minor fiber releases.

It is important to recognize that different levels of training are needed for workers involved with fiber release episodes. A major release will generally require “asbestos abatement worker training,” rather than the degree of training considered adequate for O&M workers.

EPA suggests that building owners and Asbestos Program Managers consult with state and local regulatory officials before establishing formal training procedures for each type of situation.

The following table should be useful in determining when to apply certain O&M work practices in buildings. The table illustrates the O&M work practices that should be used by custodial and maintenance staff, depending on the likelihood of ACM disturbance.

<table>
<thead>
<tr>
<th>Summary of When to Apply Key O&amp;M Work Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Likelihood of ACM Disturbance</strong></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Management Responsibilities</strong></td>
</tr>
<tr>
<td>Need Pre-Work Approval from Asbestos Program Manager</td>
</tr>
<tr>
<td>Special Scheduling or Access Control</td>
</tr>
<tr>
<td>Supervision Needed</td>
</tr>
<tr>
<td>HVAC System Modification</td>
</tr>
<tr>
<td>Area Containment</td>
</tr>
<tr>
<td><strong>Personal Protection</strong></td>
</tr>
<tr>
<td>Respiratory Protection</td>
</tr>
<tr>
<td>Protective Clothing</td>
</tr>
<tr>
<td><strong>Work Practices</strong></td>
</tr>
<tr>
<td>Use of Wet Methods</td>
</tr>
<tr>
<td>Use of HEPA Vacuum</td>
</tr>
</tbody>
</table>

1) In the area where work takes place
2) Type of containment may vary. For example, small-scale, short-duration tasks may not require full containment.
Recordkeeping

All the building asbestos management documents discussed in this Guide (inspection and assessment reports, O&M program plan, work practices and procedures, respirator use procedures, fiber release reports, application for maintenance work and work approval forms, evaluations of work affecting ACM, and reinspections/surveillance of ACM) should be stored in permanent files. In addition, for employees engaged in asbestos-related work, federal regulations (see Chapter 6) require that employers retain:

- personal air sampling records, for at least 30 years. Personal air samples are those collected in the worker’s breathing zone during performance of work involving asbestos exposures.
- objective data used to qualify for exemptions from OSHA’s initial monitoring requirements for the duration of the exemption.
- medical records for each employee subject to the medical surveillance program for the duration of their employment plus 30 years.

In addition, OSHA requires that employers provide to each employee their record of exposure and medical surveillance under the Records Access Standard (29 CFR 1910.20) and the Hazard Communication Standard (29 CFR 1910.1200). See the OSHA Construction Rule (29 CFR 1926.58) or the EPA Worker Protection Rule (40 CFR 763 Subpart G) for more details of recordkeeping requirements.

EPA recommends that building owners make available all written elements of the O&M program to the building’s O&M staff as well as to tenants and other building occupants.

Chapter Summary

Although the elements discussed in this chapter should appear in any O&M program, the extent to which each applies will vary depending on the building type, the type of ACM present, and the ACM’s location and physical condition. To achieve its objectives an O&M program should include the following:

A notification program to inform building occupants, workers, and tenants about the location of ACM and how to avoid disturbing ACM.

Periodic surveillance and reinspection of ACM at regular intervals by trained workers or properly trained inspectors. Air monitoring to detect airborne asbestos fibers in the building may provide useful supplemental information when conducted along with a comprehensive visual and physical ACM inspection/reinspection program. Air samples are most accurately analyzed using transmission electron microscopy (TEM).

A “work Control/permit” system, which some building owners have used successfully to control work that could disturb ACM. This system requires the person requesting work to submit a Job Request Form to the Asbestos Program Manager before any work is begun.

O&M work practices to avoid or minimize fiber release during activities affecting ACM.

Recordkeeping. OSHA and EPA have specific requirements for workers exposed to asbestos.
What O&M Training Is Necessary?

Types of Training

Training of custodial and maintenance workers is one of the keys to a successful O&M program. If building owners do not emphasize the importance of well-trained custodial and maintenance personnel, asbestos O&M tasks may not be performed properly. This could result in higher levels of asbestos fibers in the building air and an increased risk faced by both building workers and occupants.

OSHA and EPA require a worker training program for all employees exposed to fiber levels (either measured or anticipated) at or above the action level (0.1 f/cc, 8-hour time-weighted average— the TWA) and/or the excursion limit (1.0 f/cc, 30-minute TWA—see Chapter 6). According to the EPA regulations governing schools, all school stall custodial and maintenance workers who conduct any activities that will result in the disturbance of ACM must receive 16 hours of O&M training. Some states and municipalities may also have specific training requirements for workers who may be exposed to asbestos, or who work in a building with ACM present.

With proper training, custodial and maintenance staff can successfully deal with ACM in place, and greatly reduce the release of asbestos fibers. Training sessions should provide basic information on how to deal with all types of maintenance activities involving ACM. However, building owners should also recognize that O&M workers in the field often encounter unusual, “non-textbook” situations. As a result, training should provide key concepts of asbestos hazard control. If these concepts are clearly understood by workers and their supervisors, workers can develop techniques to address a specific problem in the field. Building owners who need to provide O&M training to their custodial and maintenance staff should contact an EPA environmental assistance center (see Appendix D) or equally qualified training organization for more information.

At least three levels of maintenance worker training can be identified:

**LEVEL 1: AWARENESS TRAINING. For custodians involved in cleaning and simple maintenance tasks where ACM may be accidentally disturbed.**

For example, fixing a light fixture in a ceiling covered with surfacing ACM. Such training may range from two to eight hours, and may include such topics as:
- Background information on asbestos.
- Health effects of asbestos.
- Worker protection programs.
- Locations of ACM in the building.
- Recognition of ACM damage and deterioration.
- The O&M program for that building.
- Proper response to fiber release episodes.
LEVEL 2: SPECIAL O&M TRAINING. For maintenance workers involved in general maintenance and asbestos material repair tasks.

For example, a repair or removal of a small section of damaged TSI, or the installation of electrical conduit in an air plenum containing ACM or ACM debris. Such training generally involves at least 16 hours. This level of training usually involves more detailed discussions of the topics included in Level 1 training as well as:

- Federal, state, and local asbestos regulations.
- Proper asbestos-related work practices.
- Descriptions of the proper methods of handling ACM, including waste handling and disposal.
- Respirator use, care, and fit-testing.
- Protective clothing donning, use, and handling.
- Hands-on exercises for techniques such as glovebag work and HEPA vacuum use and maintenance.
- Appropriate and proper worker decontamination.

LEVEL 3: ABATEMENT WORKER TRAINING. For workers who may conduct asbestos abatement.

For example, conducting a removal job, constructing an enclosure, or encapsulating a surface containing ACM. This work involves direct, intentional contact with ACM. The recognized “abatement worker” training courses approved by EPA or states, under the EPA AHERA model accreditation plan for schools, which involve 24 to 32 hours of training, would fulfill this level of training.

If this level of training is provided to in-house staff, it may save time and money in the long run to use these individuals to perform such activities. This level of training is much more involved than Levels 1 and 2, although it should include some of the same elements (e.g., health effects of asbestos). It will typically include a variety of specialized topics, such as:

- Pre-asbestos abatement work activities.
- Work area preparation.
- Establishing decontamination units.
- Personal protection, including respirator selection, use, fit-testing, and protective clothing.
- Worker decontamination procedures.
- Safety considerations in the abatement work area.
- A series of practical hands-on exercises.
- Proper handling and disposal of ACM wastes.

The Asbestos Program Manager should consider conducting the training program for Levels 1 and 2 if he or she has sufficient specific asbestos knowledge and training. If the Asbestos Program Manager does not conduct the training, the building owner should hire an outside consultant or send workers to an appropriate O&M training course. A trained (preferably Certified) industrial hygienist or equally qualified safety and health professional should conduct the training on respirator use and fit-testing. A health professional should conduct the training on health effects.

OSHA or EPA Regional Offices, as well as state and local agencies and professional associations, may be able to suggest courses or direct you to listings of training providers for each of the three levels. Appendix D provides the addresses and/or phone numbers for OSHA, EPA, and EPA-sponsored training providers.

Where custodial and maintenance services are performed by a service company under contract, or where some installation or repairs are performed by employees of trade or craft contractors and subcontractors, those workers may need to have training at level 1, 2, or 3 as appropriate for their work. The Asbestos Program Manager or building owner should verify that these employees receive appropriate training before they begin any work.
In summary, good training is crucial to the success of an O&M program. Strong support for O&M training by the building owner should convince custodial and maintenance workers that following the appropriate work procedures is critical to protecting their own health as well as the health of other building occupants.

### Chapter Summary

Properly trained custodial and maintenance workers are critical to a successful O&M program. The following items are highlighted training requirements:

- OSHA and EPA require worker training program for all employees exposed to fiber levels at or above the action level (0.1 f/cc, 8-hr. TWA) and/or the excursion limit (1.0 f/cc, 30-minute TWA – see Chapter 6).

- Some states and municipalities may have specific worker training requirements.

- At least three levels of maintenance worker training can be identified:
  
  **Level 1 Awareness training** for workers involved in activities where ACM may be accidentally disturbed. May range from 2-8 hours.

  **Level 2 Special O&M training** for maintenance workers involved in general maintenance and incidental ACM repair tasks. At least 16 hours.

  **Level 3 Abatement worker training** for workers who may conduct asbestos abatement. This work involves direct, intentional contact with ACM. “Abatement worker” training courses that involve 24 to 32 hours of training fulfill this level of training.

Strong support by the building owner can convince workers that following appropriate procedures is critical to protecting their own health as well as the health of other building occupants.
What Regulations Affect Asbestos Management Programs in Buildings, Especially O&M Programs?

Federal, State, and Local Regulations Affecting O&M Programs

Building owners are governed by a variety of federal, state, and local regulations which influence the way they must deal with ACM in their facilities. Some of these regulations, particularly at the state and local level, may change frequently. Building owners should contact their state and local government agencies, in addition to organizations such as the National Conference of State Legislatures (NCSL), the National Institute of Building Sciences (NIBS), or EPA environmental assistance centers, for updated information on these requirements. (Appendix D lists phone numbers for these organizations.)

OSHA Regulations and the U.S. EPA Worker Protection Rule

There are several important Occupational Safety and Health Administration (OSHA) and EPA regulations that are designed to protect workers. They are summarized here, as guidance. OSHA has specific requirements concerning worker protection and procedures used to control ACM. These include the OSHA construction industry standard for asbestos (29 CFR 1926.58), which applies to O&M work, and the general industry asbestos standard (29 CFR 1910.1001). State-delegated OSHA plans, as well as local jurisdictions, may impose additional requirements.

For most operations and maintenance activities in building areas where only non-friable ACM is present or where friable ACM is in good condition, applicable OSHA permissible exposure limits are not likely to be exceeded. However, it is possible that some O&M activities will disturb ACM to such an extent that the OSHA limits are exceeded, unless good work practices are followed.

The OSHA standards generally cover private sector workers, and public sector employees in states which have an OSHA state plan. Public sector employees, such as city or county government employees, or certain school employees, who are not already subject to a state OSHA plan are covered by the EPA “Worker Protection Rule” (Federal Register: February 25, 1987; 40 CFR 763 Subpart G, Asbestos Abatement Projects; Worker Protection, Final Rule). Note: As this document goes to press, OSHA is considering a substantial number of changes to its regulations.

The OSHA standards and the EPA Worker Protection Rule require employers to address a number of items which are triggered by exposure of employees to asbestos fibers. Exposure is discussed in terms of fibers per cubic centimeter (cc) of air. A cc is a volume approximately equivalent to that of a sugar cube.

Two main provisions of the regulations fall into the general category of “Permissible Exposure Limits (PELs)” to airborne asbestos fibers. They are:
1 8-Hour Time-weighted average limit (TWA) – 0.2 fiber per cubic centimeter (f/cc) of air based on an 8-hour time-weighted average (TWA) sampling period. This is the maximum level of airborne asbestos, on average, that any employee may be exposed to over an 8-hour period (normal work shift).

2 Excursion limit (EL) – 1.0 f/cc as averaged over a sampling period of 30 minutes.

These levels trigger mandatory requirements, which include the use of respirators and protective clothing, the establishment of “regulated areas,” the posting of danger signs as well as the use of engineering controls and specific work practices.

OSHA regulations also establish an "Action Level": 0.1 f/cc for an 8-hour TWA. Employee training is required once the action level of 0.1 f/cc and/or the “Excursion Limit” is reached. This training must include topics specified by the OSHA rules. If an employee is exposed at or above the action level for a period of 30 days or more in a calendar year, medical surveillance is required according to the OSHA construction industry asbestos standard.

OSHA also requires medical examinations under its “General Industry Standard” for any employee exposed to fiber levels in the air at or above the OSHA “action level” (0.1 f/cc and/or the “excursion limit” (1.0 f/cc). In both cases – the action level and excursion limit – the OSHA medical examination requirement applies if the exposure occurs for at least one day per year.

The OSHA “Construction Industry Standard” (29 CFR 1926.58) for asbestos, is generally applicable for the workers who carry out the kinds of work discussed in this O&M guidance document. The OSHA construction industry asbestos standard applies to demolition and asbestos removal or encapsulation projects, as well as to repair, maintenance, alteration, or renovation if ACM is involved. ACM spills or emergency clean-up actions are also covered by this regulation.

According to those regulations, participation in a medical surveillance program is required for any employee who is required to wear a negative pressure, air-purifying respirator. Preplacement, annual, and termination physical exams are also required for these employees. However, a termination exam is only necessary under the construction industry standard (which applies to custodial and maintenance employees) if a physician recommends it. While not mandatory EPA and NIOSH recommend physical examinations, including cardiac and pulmonary tests, for any employee required to wear a respirator by the building owner. These tests determine whether workers will be unduly stressed or uncomfortable when using a respirator.

Additional requirements of the OSHA asbestos standards, such as the use of air filtration systems and hygiene facilities, involve procedures which are most applicable to large-scale asbestos abatement projects. However, these rules also include a number of recommendations for procedures which might be appropriate for a variety of O&M programs for buildings.

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

“Appendix G” which is specified as a non-mandatory section to the OSHA regulation 29 CFR 1926.58, may become mandatory under certain circumstances where “small-scale, short-duration” asbestos projects are conducted. These projects are not precisely defined in terms of either size or duration, although their nature and scope are illustrated by examples presented in the text of the regulation. Properly trained maintenance workers may conduct these projects. Examples may include removing small sections of pipe insulation or covering for pipe repair, replacing valves, installing electrical conduits, or patching or removing small sections of drywall. OSHA issued a clarification of the definition of a “small-scale, short-duration” (SS/SD) project in a September 1987 asbestos directive. The directive focuses on intent, stating that in SS/SD projects, the removal of ACM is not the primary goal of the job. If the purpose of a small-scale, short-duration project is maintenance, repair, or renovation of the equipment or surface behind the ACM—not abatement of ACM—then the appendix provisions may apply. If the intent of the work is abatement of the ACM, then the full-scale abatement control requirements apply.

In any event, this appendix section of the OSHA construction standard outlines requirements for the use of certain engineering and work practice controls such as glovebags, mini-enclosures, and special vacuuming techniques. Similar information on these procedures may be found in the EPA’s AHERA regulations for schools. (See final AHERA rule, Appendix B, for SS/SD projects.)

**U.S. EPA National Emission Standards for Hazardous Air Pollutants (NESHAP)**

(40 CFR 61 Subpart M)

EPA's rules concerning the application, removal, and disposal of ACM, as well as manufacturing, spraying and fabricating of ACM, were issued under the asbestos NESHAP. The asbestos NESHAP regulation governs asbestos demolition and renovation projects in all facilities. The NESHAP rule usually requires owners or operators to have all friable ACM removed before a building is demolished, and may require its removal before a renovation. For renovation projects where friable ACM will be disturbed, the NESHAP rule may require appropriate work practices or procedures for the control of emissions. It is prudent to note that any ACM which may become friable poses a potential hazard that should be addressed. The building owner should consider that in many instances, the removal of friable ACM prior to demolition could be less expensive than removals while the building is still occupied and being used. Some revisions to the current NESHAP rule are anticipated by the end of 1.990.
Notification

EPA or the state (if the state has been delegated authority under NESHAP) must be notified before a building is demolished or renovated. The following information is required on the NESHAP notice:

1. Name and address of the building owner or manager;
2. Description and location of the building;
3. Estimate of the approximate amount of friable ACM present in the facility;
4. Scheduled starting and completion dates of ACM removal;
5. Nature of planned demolition or renovation and method(s) to be used;
6. Procedures to be used to comply with the requirements of the regulation; and
7. Name, address, and location of the disposal site where the friable asbestos waste material will be deposited.

The notification requirements do not apply if a building owner plans renovation projects which will disturb less than the NESHAP limits of 160 square feet of friable ACM on facility components or 260 linear feet of friable ACM on pipes (quantities involved over a one-year period). For renovation operations in which the amount of ACM equals or exceeds the NESHAP limits, notification is required as soon as possible.

Emissions Control and Waste Disposal

The NESHAP asbestos rule prohibits visible emissions to the outside air by requiring emission control procedures and appropriate work practices during collection, packaging, transportation or disposal of friable ACM waste. All ACM must be kept wet until sealed in a leak-tight container that includes the appropriate label. The following table provides a simplified reference for building owners regarding the key existing NESHAP requirements.

<table>
<thead>
<tr>
<th>Resource Conservation and Recovery Act Regulations (RCRA); and Comprehensive Environmental Response, Compensation, and Liability Act Regulations (CERCLA, or “Superfund”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under expanded authority of RCRA, a few states have classified asbestos-containing waste as a hazardous waste, and require stringent handling, manifesting, and disposal procedures. In those cases, the state hazardous waste agency should be contacted before disposing of asbestos for approved disposal methods and recordkeeping requirements, and for a list of approved disposal sites.</td>
</tr>
</tbody>
</table>

Friable asbestos is also included as a hazardous substance under EPA’s CERCLA regulations. The owner or manager of a facility (e.g., building, installation, vessel, landfill) may have some reporting requirements. Check with your EPA Regional Office for further information. (See Appendix D for telephone numbers.)

In October 1987, EPA issued final regulations to carry out the Asbestos Hazard Emergency Response Act of 1986 (AHERA). The AHERA regulatory requirements deal only with public and private elementary and secondary school buildings. The regulations require schools to conduct inspections, develop comprehensive asbestos management plans, and select asbestos response actions to deal with asbestos hazards. The AHERA rules do not require schools to remove ACM.

A key element of the AHERA regulations requires schools to develop an O&M program if friable ACM is present. The AHERA O&M requirements also cover non-friable ACM which is about to become friable. For example, drilling through an ACM wall will likely result in friable ACM. Under the AHERA O&M provisions, schools must carry out specific O&M procedures which provide for the clean-up of any ACM releases and help ensure the general safety of school maintenance and custodial workers, as well as all other school building occupants. The AHERA regulation’s O&M requirements mandate that schools employ specific work practices including wet wiping, HEPA vacuuming, proper waste disposal procedures, and specific training for custodial and maintenance employees who work in buildings with ACM.

Bans on some uses and applications of asbestos under the Clean Air Act were briefly described in Chapter 1. In July 1989, under the Toxic Substances Control Act (TSCA), EPA promulgated an Asbestos Ban and Phaseout Rule. The complete rule was published in the Federal Register on July 12, 1989.

Beginning in 1990 and taking effect in three stages, the rule prohibits the importation, manufacture, and processing of 94 percent of all remaining asbestos products in the United States over a period of seven years.
## Existing NESHAP Requirements Summary*

<table>
<thead>
<tr>
<th></th>
<th>Demolition</th>
<th>Renovation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AMOUNT</strong>&lt;br&gt;(in 1 yr.)</td>
<td>&gt; 260 ln. ft. or &gt; 160 sq. ft.</td>
<td>&lt;260 ln. ft. or &lt;160 sq. ft.</td>
</tr>
<tr>
<td><strong>NOTIFICATION</strong></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td><strong>HOW FAR IN ADVANCE</strong>&lt;br&gt;*</td>
<td>10 DAYS</td>
<td>20 DAYS</td>
</tr>
<tr>
<td><strong>EMISSION CONTROLS</strong>&lt;br&gt;(Work Practices)</td>
<td>YES</td>
<td>NOT REQUIRED</td>
</tr>
<tr>
<td><strong>DISPOSAL STANDARD</strong></td>
<td>YES</td>
<td>NOT REQUIRED</td>
</tr>
</tbody>
</table>

*May be changed on promulgation of Revised NESHAP Rule in 1990

---

## Chapter Summary

A variety of federal, state, and local regulations govern the way building owners must deal with ACM in their facilities. State and local regulations maybe more stringent than federal standards and often change rapidly. Building owners should periodically check with the appropriate Federal, State, and local authorities to determine whether any new asbestos regulations have been developed or whether current regulations have been amended. Specific federal regulations that may affect asbestos-related tasks and/or workers are highlighted here:

- EPA Worker Protection Rule (40 CFR 763 Subpart, G).
- EPA Asbestos Hazard Emergency Response Act (AHERA) Regulations (40 CFR 763 Subpart E),
- EPA Asbestos Ban and Phaseout Rule (40 CFR 763 Subpart I),
## Appendix A.

### Glossary of Terms

**ACM**  
Asbestos-Containing Material. Any material containing more than one percent asbestos.

**Asbestos Program Manager**  
A building owner or designated representative who supervises all aspects of the facility asbestos management and control program.

**Air Plenum**  
Any space used to convey air in a building or structure. The space above a suspended ceiling is often used as an air plenum.

**Asbestos Abatement**  
Procedures to control fiber release from asbestos-containing materials in a building or to remove it entirely. These may involve removal, encapsulation, repair, encasement, and operations and maintenance programs.

**Delamination**  
Separation of one layer from another.

**EPA**  
U.S. Environmental Protection Agency

**Friable Asbestos**  
Any materials that contain greater than one percent asbestos, and which can be crumbled, pulverized, or reduced to powder by hand pressure. This may also include previously non-friable material which becomes broken or damaged by mechanical force.

**Glovebag**  
A polyethylene or polyvinyl chloride bag-like enclosure affixed around an asbestos-containing source (most often, TSI) so that the material may be removed while minimizing release of airborne fibers to the surrounding atmosphere.

**HEPA Filter**  
High-Efficiency Particulate Air Filter. Such filters are rated to trap at least 99.97% of all particles 0.3 microns in diameter or larger.

**Industrial Hygienist**  
A professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards.

**Medical Surveillance**  
A periodic comprehensive review of a worker’s health status. The required elements of an acceptable medical surveillance program are listed in the Occupational Safety and Health Administration standards for asbestos.

**Miscellaneous ACM**  
Interior asbestos-containing building material on structural components, structural members or fixtures, such as floor and ceiling tiles; does not include surfacing material or thermal system insulation.

**NESHAP**  

**NIOSH**  
The National Institute for Occupational Safety and Health, which was established by the Occupational Safety and Health Act of 1970. Primary functions of NIOSH are to conduct research, issue technical information, and test and certify respirators.

**Personal Air Samples**  
An air sample taken with a sampling pump directly attached to the worker with the collecting filter and cassette placed in the worker’s breathing zone. These samples are required by the OSHA asbestos standards and the EPA Worker Protection Rule.

**Prevalent Level Samples**  
Air samples taken under normal conditions (also known as ambient background samples).

**Surfacing ACM**  
Asbestos-containing material that is sprayed-on, 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, or other purposes.

**TSI**  
Thermal system insulation – asbestos-containing material applied to pipes, fittings, boilers, breeding, tanks, ducts or other interior structural components to prevent heat loss or gain or water condensation.

**TWA**  
Time-weighted Average. In air sampling, this refers to the average air concentration of contaminants during a particular sampling period.
Appendix B.

Sample Recordkeeping Form:

Form 1. A sample form for recording information during ACM reassessment.

Reinspection of Asbestos-Containing Materials

Location of asbestos-containing material (address, building, room, or general description)

________________________________________________________________________

________________________________________________________________________

Type of asbestos-containing material(s):

1. Sprayed-or troweled-on ceilings or walls
2. Sprayed-or troweled-on structural members
3. Insulation on pipes, tanks, or boiler
4. Other (describe)

________________________________________________________________________

Abatement Status:

1. The material has been encapsulated , enclosed , neither , removed .

Assessment:

1. Evidence of physical damage

________________________________________________________________________

2. Evidence of water damage:

________________________________________________________________________

3. Evidence of delamination or other damage:

________________________________________________________________________

4. Degree of accessibility of the material:

________________________________________________________________________

5. Degree of activity near the material:

________________________________________________________________________

6. Location in an air plenum, air shaft, or airstream:

________________________________________________________________________

7. Other observations (including the condition of the encapsulant or enclosure, if any):

________________________________________________________________________

*Recommended Action: _________________________________________________________

________________________________________________________________________

Signed: ___________________________ Date: ___________________________

(evaluator)
Form 2. A sample application form for maintenance work approval.

Job Request Form for Maintenance Work

Name: ___________________________ Date: ___________________________
Telephone No. ___________________________ Job Request No. ___________________________
Requested starting date: ______________ Anticipated finish date: ______________
Address, building, and room number(s) (or description of area) where work is to be performed:

Description of work

Description of any asbestos-containing material that might be affected, if known (include location and type):

Name and telephone number of requestor:

Name and telephone number of supervisor

Submit this application to

(The Asbestos Program Manager)

NOTE An application must be submitted for all maintenance work whether or not asbestos-containing material might be affected. An authorization must then be received before any work can proceed.

_____ Granted (Job Request No. ___________________________)
_____ With conditions*
_____ Denied

*Conditions ___________________________
Maintenance Work Authorization Form

AUTHORIZATION

Authorization is given to proceed with the following maintenance work:

______________________________

______________________________

______________________________

______________________________

PRESENCE OF ASBESTOS-CONTAINING MATERIALS

_____ Asbestos-containing materials are not present in the vicinity of the maintenance work.

_____ ACM is present, but its disturbance is not anticipated however, if conditions change, the Asbestos Program Manager will re-evaluate the work request prior to proceeding.

_____ ACM is present, and maybe disturbed.

Work Practices if Asbestos-Containing Materials Are Present

The following work practices shall be employed to avoid or minimum disturbing asbestos:

______________________________

______________________________

______________________________

Personal Protection if Asbestos-Containing Materials Are Present

The following equipment/clothes shall be used/worn during the work to protect workers:

______________________________

______________________________

______________________________

______________________________

(manuscripts on personal protection can be referenced)

Special Practices and/or Equipment Required:

______________________________

______________________________

Signed: __________________________ Date: __________________________

(Asbestos Program Manager)
Form 4. A sample work evaluation form

This evaluation covers the following maintenance work:

Location of work (address, building, room number(s), or general description):

________________________________________________________________________

________________________________________________________________________

Date(s) of work ____________________________

Description of work _________________________

Work approval form number: ____________________________

Evaluation of work practices employed to minimize disturbance of asbestos:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Evaluation of work practices employed to contain released fibers and to clean up the work area:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Evaluation of equipment and procedures used to protect workers:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Personal air monitoring results; (i-house worker or contract?)

Worker name ____________________________ Results: ____________________________

Worker name ____________________________ Results: ____________________________

Handling or storage of ACM waste: ____________________________

signed ____________________________ Date: ____________________________

(Asbestos Program Manager)
Appendix C
Illustrative Organization Chart

Figure 1. A sample organization for a building owner with a large in-house management staff. Shaded boxes indicate outside assistance.

Owners and Managers Who Employ an Extensive In-house Management Staff

IN-HOUSE STAFF (FIGURE 1)

**Asbestos Program Manager:** Has authority and overall responsibility for the asbestos control program. May develop the O&M program. Coordinates all activities. May also administer the respiratory protection program.

**Physical Plant Manager:** (may also be the Asbestos Program Manager) Participates in establishing work practices for cleaning and maintenance activities, and in training custodial and maintenance staff to use them. Assists in implementing the O&M program and in conducting periodic reinspection of the ACM. Ensures that outside contractors follow O&M procedures.

**Communications Person:** (Public Affairs Officer, Nurse, Physician, Industrial Hygienist) Assists in preparation and distribution of information about ACM in the building. Person should be a good speaker and communicator.

**Recordkeeping Person:** (Executive Assistant, Secretary) Responsible for maintaining records.

OUTSIDE ASSISTANCE

**OSHA Regional Office:** May be helpful in answering questions about existing regulations, and providing guidance for worker protection.

**Asbestos Consultant(s)**: (Industrial Hygienists, Health Professionals, Architects, Engineers, and others) May assist in various aspects of the asbestos O&M program, including its development and implementation. May also conduct material inspections and provide work practice recommendations.

**Lawyer:** Provides advice on legal requirements (such as laws and statutes) and liability aspects of the program.

**Asbestos Contractor**: May provide services for ACM abatement and for building decontamination following a fiber release episode.

*It is important for owners and Asbestos Program Manager’s to consider potential “conflict of interest” issues pertaining to those persons or firms used to sample, inspect, assess, analyze, recommend response actions, design response actions, and conduct asbestos response actions.
Owners and Managers Who Contract For Services

IN-HOUSE STAFF (FIGURE 2)

**Asbestos Program Manager:** Has overall responsibility for the asbestos control program. May develop and implement the O&M program. Establishes training and experience requirements for contractor’s workers. Supervises and enforces work practices with assistance of work crew supervisors. Conducts periodic reinspection and responsible for recordkeeping. This person should be properly trained in O&M program development and implementation (see Chapter 5).

**Asbestos Consultant(s)**: (Industrial Hygienists, Health Professionals, Architects, Engineers, and others) May assist Asbestos Program Manager in various aspects of the asbestos O&M program, including development and implementation. May also conduct the inspection and provide work practices recommendations.

**Lawyer:** Provides advice on legal requirements (laws and statutes) and liability aspects of the program.

**Asbestos Contractor:** May provide services for ACM abatement and building decontamination following a fiber release episode.

*It is important for owners and Asbestos Program Manager’s to consider potential “conflict of interest” issues pertaining to those persons or firms used to sample, inspect, assess, analyze, recommend response actions, design response actions, and conduct asbestos response actions.

OUTSIDE ASSISTANCE

**EPA Regional Asbestos Coordinator and State/Local Government Advisors:** Provide general guidance and answer specific questions.

**OSHA Regional Office:** May be helpful in answering questions about existing regulations and providing guidance for worker protection.

Figure 2. A *sample* organization for owners of buildings where services are provided by contract. Shaded boxes indicate outside assistance.
APPENDIX D.

Additional Assistance and Training

EPA REGIONAL CONTACTS

Additional assistance can be obtained from your U.S. EPA Regional Asbestos Coordinators, NESHAP Regional Coordinators, and OSHA Regional Offices. Their telephone numbers are listed below.

**EPA Region I:** (CT, ME, MA, NH, RI, VT)
Asbestos Coordinator (617) 565-3835
NESHAP Coordinator (617) 565-3265

**EPA Region II:** (NJ, NY, PR, VI)
Asbestos Coordinator (201) 321-6671
NESHAP Coordinator (212) 264-6770

**EPA Region III:** (DE, DC, MD, PA, VA, WV)
Asbestos Coordinator (215) 597-3160
NESHAP Coordinator (215) 597-6550

**EPA Region IV:** (AL, FL, GA, KY, MS, NC, SC, TN)
Asbestos Coordinator (404) 347-5014
NESHAP Coordinator (404) 347-2904

**EPA Region V:** (IL, IN, MI, MN, OH, WI)
Asbestos Coordinator (312) 886-6003
NESHAP Coordinator (312) 353-2088

**EPA Region VI:** (AR, LA, NM, OK, TX)
Asbestos Coordinator (214) 655-7244
NESHAP Coordinator (214) 655-7229

**EPA Region VII:** (IA, KS, MO, NE)
Asbestos Coordinator (913) 551-7020
NESHAP Coordinator (913) 551-7020

**EPA Region VIII:** (CO, MT, ND, SD, UT, WY)
Asbestos Coordinator (303) 293-1442
NESHAP Coordinator (303) 294-7685

**EPA Region IX:** (AZ, CA, HI, NV, AS, GU)
Asbestos Coordinator (415) 556-5406
NESHAP Coordinator (415) 556-5526

**EPA Region X:** (AK, ID, OR, WA)
Asbestos Coordinator (206) 442-4762
NESHAP Coordinator (206) 442-1757

**OSHA REGIONAL OFFICES**

Region I – Boston, MA (617) 223-6710
Region II – New York, NY (212) 944-3432
Region III – Philadelphia, PA (215) 596-1201
Region IV – Atlanta, GA (404) 347-3573
Region V – Chicago, IL (312) 353-2220
Region VI – Dallas, TX (214) 767-4731
Region VII – Kansas City, MO (816) 374-5861
Region VIII – Denver, CO (303) 844-3061
Region IX – San Francisco, CA (415) 995-5672
Region X – Seattle, WA (206) 442-5930

**Toxic Substances Control Act (TSCA) Assistance Hotline**

Copies of the EPA Guidance Documents, Technical Bulletins, and other publications cited here can be obtained by calling the TSCA Assistance Hotline, in Washington, D.C., at: (202) 554-1404.

**Approved Training Centers**

Certain training centers and satellite centers were initially funded by EPA to develop asbestos training courses. They and other training providers approved by EPA or states, offer courses for professionals such as asbestos inspectors and management planners involved with ACM detection and control, for asbestos abatement project designers, project supervisors and abatement workers, and others. In general, qualified professionals trained as inspectors and asbestos management planners would be good choices to design an O&M plan. Original training centers are located at the following sites:

- Georgia Institute of Technology
- Tufts University
- GTI/EDL/ESTD
- GTRI/EDL/ESTD
- 29 O’Keefe Building
- Curtis Hall
- Atlanta, GA 30332
- Asbestos Information Center
- (404) 894-3806
- 474 Boston Avenue
- Medford, MA 02155
- (617) 353-2088
- University of Kansas
- University of Illinois at Chicago
- Asbestos Training Center
- University of Illinois at Chicago
- 6600 College Blvd. Suite 315
- University Information Center
- Overland Park, KS 66211
- BOX 6998
- (913) 491-0181
- Chicago, IL 60680
- (312) 643-7143
- Pacific Asbestos
- Additional training providers are listed in the Federal Register
- Information Center
- on a regular basis. Call (202) 554-1404 for information. In
- University CA/Extension
- addition, information on how to receive a copy of an O&M
- 2223 Fulton St.
- Course produced by an EPA contractor maybe obtained at
- Berkeley, CA 94720
- the same number.
- (415) 643-7143

**OTHER ORGANIZATIONS**

National Conference of State Legislatures (NCSL)
- Denver, CO – (303) 623-7800
National Institute of Building Sciences (NIBS),
- Washington, D.C. – (202) 289-7800
American Board of Industrial Hygiene (ABIH),
- Lansing, MI – (517) 321-2638
National Institute for Standards and Technology (NIST),
- Gaithersburg, MD – (contact for lab accreditation) – (301) 975-4016

Page 106
APPENDIX E:

Respiratory Protection Recommendations

EPA recommends that the following guidelines be followed for respiratory protection during various custodial and maintenance tasks. These guidelines are issued to cover tasks that do not always create routine fiber levels high enough to trigger OSHA respiratory protection requirements. Therefore, building owners should note they go beyond OSHA requirements.

- **Routine maintenance where contact with ACM is unlikely.** No respiratory protection required. (Air-purifying respirator with high-efficiency filters should be available if needed: half-face or full facepiece).

- **Routine maintenance where there is reasonable likelihood of ACM disturbance.** Air-purifying respirator with high-efficiency filters (half-face or full facepiece).

- **Maintenance or repair involving intentional small-scale disturbance of ACM.** Powered air-purifying respirator with high-efficiency filters, or air-purifying respirator with high-efficiency filters (half-face or full facepiece). If glove bags are used to contain the ACM during disturbance, either half-face or full facepiece air-purifying respirators with high-efficiency filters may be used.

- **Any O&M activity requiring sawing, cutting, drilling, abrading, grinding, or sanding ACM.** Powered air-purifying respirator with high-efficiency filters, or full facepiece, air-purifying respirator equipped with high-efficiency filters should be used.

- **Cleanup after a minor asbestos fiber release.** Air-purifying respirator with high-efficiency filters (half-face or full facepiece).

- **Cleanup after a major asbestos fiber release.** Air-supplied respirators, either the “Type C” airline respirator equipped with a backup high-efficiency filter or SCBA (Self-Contained Breathing Apparatus).

The U.S. EPA, in collaboration with NIOSH, has issued a guidance document, “A Guide to Respiratory Protection for the Asbestos Abatement Industry” which recommends levels of respiratory protection for those engaged in large-scale asbestos abatement projects that are beyond routine O&M procedures. Air-supplied self-contained, and “type C” airline respirators are the focus of the EPA/NIOSH document. These respirators allow workers to breathe fresh air supplied through hoses and face masks, and are generally used only by asbestos abatement workers engaged in large-scale asbestos removal projects. They are usually not considered either practical or necessary for most custodial and maintenance jobs.

An industrial hygienist or environmental/occupational health professional should assist workers with respirator selection and fitting, and train them in respirator use. Fit-testing (which means determining whether a particular brand and size of respirator properly fits an individual worker) is essential, since respirators which leak at the face seal provide significantly less protection. OSHA requires fit-testing initially and every six months for employees required to wear a negative pressure respirator for protection against asbestos, or for individuals exposed at or above the OSHA-specified limits.

A respirator’s effectiveness is also influenced by how it is handled, cleaned, and stored. Custodial and maintenance staff should clean their respirators after each use, and disinfect their respirators at the end of a day’s use. This improves comfort, and also reduces the chances of skin irritation or infection. After cleaning the respirator, custodial and maintenance staff should place the respirator (with the worker’s name) in a clean and sanitary location and store the unit in a secure place for future use. Respirators should be visually inspected by the user before and after each use, during cleaning and at least monthly when not in use. Inspection records should be maintained accordingly. When the respirator’s high-efficiency filters are discarded, they should be disposed of as asbestos waste.
**APPENDIX F**

**Existing EPA Guidance for Each Step That a Building Owner May Take to Control ACM**

<table>
<thead>
<tr>
<th>Action</th>
<th>Existing EPA Guidance/Regulations*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appoint Asbestos Program Manager and Develop an Organizational Policy.</td>
<td>“Guidance for Controlling Asbestos-Containing Materials in Buildings” (“Purple Book”) EPA publication number: 560/5-85-024</td>
</tr>
<tr>
<td>Inspect the facility to determine if ACM is present. Take bulk samples of suspect ACM and assess the material’s condition.</td>
<td>“Guidance for Controlling Asbestos-Containing Materials in Buildings” (“Purple Book”, chapter 2) EPA publication number 560/5-85-024</td>
</tr>
<tr>
<td>Establish an O&amp;M program.</td>
<td>“Simplified Sampling Scheme for Surfacing Materials” (“Pink Book”) EPA publication number: 560/5-85-030a</td>
</tr>
<tr>
<td>Establish an O&amp;M program.</td>
<td>Model training course materials for accrediting asbestos building inspectors in accordance with AHERA (inspection/assessment materials).</td>
</tr>
<tr>
<td>Establish an O&amp;M program.</td>
<td>“Purple Book, Chapter 3</td>
</tr>
<tr>
<td>Establish an O&amp;M program.</td>
<td>AHERA regulations, sections 763.91 and 763.92</td>
</tr>
<tr>
<td>Establish an O&amp;M program.</td>
<td>EPA Guidance for Service and Maintenance Personnel. EPA publication number 560/5-85-018</td>
</tr>
<tr>
<td>Implement and Conscientiously Manage the O&amp;M Program; Assess the Potential for Exposure to Asbestos and Select Response Actions.</td>
<td>“Purple Book”, Chapter 4</td>
</tr>
<tr>
<td>Implement and Conscientiously Manage the O&amp;M Program; Assess the Potential for Exposure to Asbestos and Select Response Actions.</td>
<td>Model training course materials for accrediting asbestos management planners in accordance with AHERA (assessment materials).</td>
</tr>
<tr>
<td>Implement and Conscientiously Manage the O&amp;M Program; Assess the Potential for Exposure to Asbestos and Select Response Actions.</td>
<td>AHERA regulations, sections 763.88 and 793.92</td>
</tr>
<tr>
<td>Select and Implement Abatement Actions Other Than O&amp;M When Necessary</td>
<td>“Purple Book”, Chapter 6</td>
</tr>
<tr>
<td>Select and Implement Abatement Actions Other Than O&amp;M When Necessary</td>
<td>AHERA regulations, section 763.93 (including 763.85 through 763.92)</td>
</tr>
<tr>
<td>Select and Implement Abatement Actions Other Than O&amp;M When Necessary</td>
<td>AHERA regulation, appendix A Determining Completion of Response Actions-Methods.</td>
</tr>
<tr>
<td>Select and Implement Abatement Actions Other Than O&amp;M When Necessary</td>
<td>U.S. EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Regulations (40 CFR 61)</td>
</tr>
<tr>
<td>Select and Implement Abatement Actions Other Than O&amp;M When Necessary</td>
<td>Model training course materials for accrediting asbestos management planners in accordance with AHERA (assessment materials).</td>
</tr>
</tbody>
</table>

*Most of these guidance materials are available through EPA’s TSCA Assistance Hotline, at (202) 554-1404.
APPENDIX G:

- Cement Pipes
- Cement Wallboard
- Cement Siding
- Asphalt Floor Tile
- Vinyl Floor Tile
- Vinyl Sheet Flooring
- Flooring Backing
- Construction Mastics (floor tile, carpet, ceiling tile, etc.)
- Acoustical Plaster
- Decorative Plaster
- Textured Paints/Coatings
- Ceiling Tiles and Lay-in Panels
- Spray-Applied Insulation
- Blown-in Insulation
- Fireproofing Materials
- Taping Compounds (thermal)
- Packing Materials (for wall/floor penetrations)
- High Temperature Gaskets
- Laboratory Hoods/Table Tops
- Laboratory Gloves
- Fire Blankets
- Fire Curtains
- Elevator Equipment Panels
- Elevator Brake Shoes
- HVAC Duct Insulation
- Boiler Insulation
- Breaching Insulation
- Ductwork Flexible Fabric Connections
- Cooling Towers
- Pipe Insulation (corrugated air-cell, block, etc.)
- Heating and Electrical Ducts
- Electrical Panel Partitions
- Electrical Cloth
- Electric Wiring Insulation
- Chalkboards
- Roofing Shingles
- Roofing Felt
- Base Flashing
- Thermal Paper Products
- Fire Doors
- Caulking/Putties
- Adhesives
- Wallboard
- Joint Compounds
- Vinyl Wall Coverings
- Spackling Compounds

NOTE: This list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of materials may contain asbestos.

APPENDIX H:


Appendix D
EPA Region 6
Asbestos Containing Materials List
Asbestos Containing Materials

Note: The following list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of materials may contain asbestos.

Sample List of Suspect Asbestos - Containing Materials

<table>
<thead>
<tr>
<th>Product/Covering</th>
<th>Sample Product/Covering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement Pipes</td>
<td>Elevator Brake Shoes</td>
</tr>
<tr>
<td>Cement Wallboard</td>
<td>HVAC Duct Insulation</td>
</tr>
<tr>
<td>Cement Siding</td>
<td>Boiler Insulation</td>
</tr>
<tr>
<td>Asphalt Floor Tile</td>
<td>Breaching Insulation</td>
</tr>
<tr>
<td>Vinyl Floor Tile</td>
<td>Ductwork Flexible Fabric Connections</td>
</tr>
<tr>
<td>Vinyl Sheet Flooring</td>
<td>Cooling Towers</td>
</tr>
<tr>
<td>Flooring Backing</td>
<td>Pipe Insulation (corrugated air-cell, block, etc.)</td>
</tr>
<tr>
<td>Construction Mastics</td>
<td>Heating and Electrical Ducts</td>
</tr>
<tr>
<td>(floor tile, carpet, ceiling tile, etc.)</td>
<td>Electrical Panel Partitions</td>
</tr>
<tr>
<td>Acoustical Plaster</td>
<td>Electrical Cloth</td>
</tr>
<tr>
<td>Decorative Plaster</td>
<td>Electric Wiring Insulation</td>
</tr>
<tr>
<td>Textured Paints/Coatings</td>
<td>Chalkboards</td>
</tr>
<tr>
<td>Ceiling Tiles and Lay-in Panels</td>
<td>Roofing Shingles</td>
</tr>
<tr>
<td>Spray-Applied Insulation</td>
<td>Roofing Felt</td>
</tr>
<tr>
<td>Blown-in Insulation</td>
<td>Base Flashing</td>
</tr>
<tr>
<td>Fireproofing Materials</td>
<td>Thermal Paper Products</td>
</tr>
<tr>
<td>Taping Compounds (thermal)</td>
<td>Fire Doors</td>
</tr>
<tr>
<td>Packing Materials (for wall/floor penetrations)</td>
<td>Caulking/Putties</td>
</tr>
<tr>
<td>High Temperature Gaskets</td>
<td>Adhesives</td>
</tr>
<tr>
<td>Laboratory Hoods/Table Tops</td>
<td>Wallboard</td>
</tr>
<tr>
<td>Laboratory Gloves</td>
<td>Joint Compounds</td>
</tr>
<tr>
<td>Fire Blankets</td>
<td>Vinyl Wall Coverings</td>
</tr>
<tr>
<td>Fire Curtains</td>
<td>Spackling Compounds</td>
</tr>
<tr>
<td>Elevator Equipment Panels</td>
<td></td>
</tr>
</tbody>
</table>