Asbestos Management Program
Carnegie Mellon University

Revision 007

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Asbestos Management Program
Carnegie Mellon University

Procedure #AM-0: Program Overview

Contents
This document presents the procedures related to the management of asbestos containing materials at Carnegie Mellon University. The Department of Environmental Health and Safety (EH&S) coordinates the work of the Carnegie Mellon Asbestos Management Plan. Included in this Program are procedures for:

- #AM-1 Identification of asbestos-containing materials
- #AM-2 Assessment of risk of asbestos-containing materials and Determining Appropriate Response Actions for ACM
- #AM-3 Routine Surveillance and Operations/Maintenance of ACM
- #AM-4 Repair, Encapsulation, Enclosure and Removal of ACM
- #AM-5 Training requirements for asbestos-related activities
- #AM-6 Approved asbestos consultants/contractors/laboratories
- #AM-7 Recordkeeping for Asbestos Activities
- #AM-8 Periodic Review and Audit of Program
- #AM-9 Database of Locations, of Abatement and Sampling Activities
- #AM-10 Exposure Monitoring

Attachment 1 Checklist of activities for Campus Design and Facility Development (CDFD)

Applicable Regulations
A number of regulations are applicable to activities associated with the asbestos-containing materials at Carnegie Mellon. These include but are not limited to the following:

- OSHA Worker Protection, 29 CFR 1910.1001
- OSHA Construction Industry Standard, 29 CFR 1926.1101
- OSHA Respiratory Protection 29 CFR 1910.134
- EPA NESHAPS 40 CFR Part 61, Subchapter C
- EPA Asbestos in Schools Rule, 40 CFR 763
- Commonwealth of Pennsylvania Dept. of Labor and Industry Asbestos Certification
- County of Allegheny, Title 20

Policy
These overall policies address all asbestos-related activity at Carnegie Mellon University:
• At no time shall any university employee be exposed to asbestos fibers at an amount greater than the OSHA PEL currently in effect.
• At no time shall unlicensed persons perform any asbestos activity that is addressed by the Commonwealth of Pennsylvania Dept. of Labor and Industry Asbestos Certification regulations. This includes asbestos inspections/sampling, project design, and abatement supervisor or worker.
• The university shall use the Allegheny County clearance air standard (0.01 f/cc) as its maximum allowable asbestos airborne level.
• There are currently no campus areas subject to the AHERA Asbestos-In-Schools regulation. Previously, that portion of Margaret Morrison Carnegie Hall occupied by the Children’s School, where kindergarten instruction occurs was formerly addressed by AHERA. All asbestos from this area has been removed; completed in 2005.
• Environmental Health & Safety (EH&S) is responsible for oversight for the university’s compliance with asbestos regulations, as well as these policies and procedures.
Procedure AM-1: Identification of asbestos-containing materials

Current inventory of asbestos

There has been no comprehensive process for the identification of all ACM in campus buildings, although a great deal of formal and informal inspection, sampling and analysis has been performed. Several buildings have been completely surveyed while others have been partially surveyed. A good deal of additional identification work has been undertaken during building renovation projects. EH&S maintains all records and reports for asbestos identification activities. They also maintain and periodically update a database of the locations of known asbestos materials on campus. A summary of the materials and locations is present in the University’s Emergency Operations Plan. The campus community and other interested parties may contact EH&S for this information.

Sampling, Inspection and Analysis

Confirmation of the presence or absence of asbestos containing materials is a critical activity when there is concern expressed by building occupants or when there will be renovation activities in a building. If there is not current information confirming the presence or absence of asbestos materials at a given location, an asbestos inspection will need to be performed, generally also involving sampling of suspect materials. Typically there are two ways to perform this function:

1. University personnel will collect bulk material samples as deemed appropriate to determine the asbestos status of an area or material. The sample(s) shall be collected in a manner that minimizes any asbestos fiber release.

2. An approved (see procedure AM-6 for details) asbestos consultant may perform sampling and or inspection of the particular area(s) or material(s). This work will be coordinated either by the appropriate Campus Design & Facility Development (CDFD) Project Manager (typically) by an FMS project manager (for smaller projects) OR by EH&S (for selected projects).

NOTE: Only persons holding a current Asbestos Inspector license from the Commonwealth of Pennsylvania Department of Labor & Industry may collect bulk samples, regardless of whether university personnel or contractors perform the activity.

NOTE: Laboratories performing bulk sample analyses for asbestos content must be approved by EH&S for this activity; approval of consultants comprehends this approval in that process.

3. A copy of all laboratory test results or inspection reports with test results shall be provided to EH&S for retention and inclusion in the asbestos database. (See procedure AM-7)

4. The location databases referenced above can be requested via safety@andrew.cmu.edu. (See procedure AM-9)
### Procedure AM-2: Assessment of Risk & Determining Appropriate Response Actions for ACM

#### Risk Assessment

Assessing the risk associated with asbestos containing materials and determining the appropriate response actions are based on the condition and type of material in question, and its potential for damage and/or exposure. These factors shall be determined by the asbestos inspector. The following Table outlines the appropriate response actions for the material and its condition and represents suitable reactions to the risk expected by the situation. The inspector or EH&S may choose a more stringent response if this is deemed appropriate.

#### Table 1: Determining Response Action for ACM

<table>
<thead>
<tr>
<th>Surfacing Material</th>
<th>Repair damage and remove debris</th>
<th>Enclose, encapsulate or remove material, if repair is not practical or appropriate.</th>
<th>Place in O&amp;M program</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i.e., plaster, acoustical plaster, fireproofing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damaged (&lt;10% total, &lt;25% localized)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Significantly damaged (&gt;10% total, &gt;25% localized)*</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Undamaged, with potential for damage</td>
<td>X**</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Undamaged, with potential for significant damage</td>
<td>X**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undamaged, inaccessible</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

*also isolate area and restrict access

**if preventive measures will not prevent damage

<table>
<thead>
<tr>
<th>Thermal System Insulation</th>
<th>Repair damage and remove debris</th>
<th>Enclose, encapsulate or remove material, if repair is not practical or appropriate.</th>
<th>Place in O&amp;M program</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i.e., pipe, tank or boiler insulation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damaged (&lt;10% total, &lt;25% localized)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Significantly damaged (&gt;10% total, &gt;25% localized)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Undamaged, with potential for damage</td>
<td>X**</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Undamaged, with potential for significant damage</td>
<td>X**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undamaged, inaccessible</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**if preventive measures will not prevent damage
**Miscellaneous Material**  
(i.e., floor tile, ceiling tile, transite)  

<table>
<thead>
<tr>
<th>Condition</th>
<th>Repair damage and remove debris</th>
<th>Enclose, encapsulate or remove material, if repair is not practical or appropriate</th>
<th>Place in O&amp;M program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damaged (&lt;10% total, &lt;25% localized)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Significantly damaged (&gt;10% total, &gt;25% localized)*</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Undamaged, with potential for damage</td>
<td>X**</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Undamaged, with potential for significant damage</td>
<td>X**</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Undamaged, inaccessible</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

*also isolate area and restrict access  
**if preventive measures will not prevent damage
Procedure AM-3: Routine Surveillance and Operations/Maintenance of ACM

O&M Program

An Operations and Maintenance (O&M) Program is a process by which asbestos-containing material not appropriate for active abatement (i.e., removal, enclosure or encapsulation) is managed. This management is designed to protect the health and safety of people in areas of ACM by monitoring the condition of asbestos materials and controlling the release of asbestos fibers. O&M activities will be performed by trained personnel, either in-house or from outside contractors, depending on the level of work and the timeliness required.

1. Periodic inspection and surveillance of asbestos materials will occur on a schedule appropriate to the material location, type and previous assessments. This process consists of viewing the areas of asbestos containing materials and identifying any areas of damage, potential fiber release or change in condition from the previous assessment. Records of this activity will be retained by EH&S.

2. If the periodic inspection and assessment identifies areas of ACM damage or potential fiber release, corrective actions will be initiated to address these conditions, following the process presented in the previous procedure. EH&S will coordinate any abatement or repair activity, through involving the FMS asbestos Project Manager where appropriate.

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1 In general, most friable asbestos areas will be assessed on an annual basis.
Procedure 4: Repair, Encapsulation, Enclosure and Removal of ACM

General Information

Asbestos abatement includes any repair, enclosure, encapsulation or removal of asbestos containing materials.

All asbestos abatement work must be performed by properly licensed and accredited contractors using accredited and licensed supervisors and workers. It is the responsibility of the Carnegie Mellon staff person coordinating this work to ensure that these conditions are met and documented.

It is critical to understand that most asbestos abatement activity at the university requires a permit from the Allegheny County Health Department (ACHD) and that a minimum of 10 days is generally needed to obtain this permit.

The abatement activities must be performed following the requirements set out in the ACHD permit, or, in the absence of a permit, by EH&S.

Repair, Encapsulation, Enclosure and Removal

All encapsulation, enclosure and removal performed on ACM at Carnegie Mellon will be performed by outside contracted workers as will all repair, except for very minor repair activity. All such workers will be appropriately accredited and licensed by applicable agencies, such as Commonwealth of Pennsylvania Department of Labor and Industry, and the Allegheny County Health Department (ACHD). Additionally, all work will be performed under permits obtained from the ACHD, where applicable.

All contracted asbestos abatement activity will be coordinated by the CDFD Project Manager or FMS Project Manager assigned to asbestos-related projects. It is their responsibility to develop the scope of work, facilitate its proper completion, and to ensure compliance with regulatory and Carnegie Mellon asbestos requirements. Due to sometimes confusing compliance requirements, EH&S needs to be informed of all asbestos activity prior to its planning and implementation, and be updated as the project progresses. EH&S personnel are available to assist CDFD and FMS in this activity.

Nearly all Most abatement projects will require clearance air monitoring to establish safe airborne levels in the work site prior to re-occupancy. The following table outlines the requirements:

<table>
<thead>
<tr>
<th>Size</th>
<th>Friable</th>
<th>Non-friable</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;160 ft² or &lt;260 lin ft</td>
<td>At least three clearance tests if area is more than 20 linear or 20 ft², otherwise, use contractor’s personals as clearance.</td>
<td>Use contractor’s personals as clearance test</td>
</tr>
<tr>
<td>(non-permitted)</td>
<td>Project monitoring may be required if the work will be in a sensitive area (as determined by EH&amp;S).</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>&gt;160 ft² or &gt;260 lin ft (permitted)</td>
<td>Five clearance tests mandatory. On-site project monitor required.</td>
<td>Five clearance tests mandatory. On-site project monitor if sensitive area (as determined by EH&amp;S) or if abatement quantity is more than 500 ft².</td>
</tr>
</tbody>
</table>

**Project Monitoring**

For projects of moderate or large size, abatement oversight by an independent consultant may be required\(^2\) during the work activity. This oversight typically includes independent air sampling, project specification monitoring and regulatory coordination. The oversight consultant will be independent of the abatement contractor and will be hired by and be responsible to the University.

Clearance air monitoring and project monitoring must be performed by an approved consultant. All abatement activity must be performed by an approved abatement contractor. Contact EH&S to identify approved firms. This list is continually updated.

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\(^2\) Project monitoring is required if the project requires a permit AND involves the abatement of *friable* asbestos. EH&S may require more stringent use of project monitoring when the situation merits.
For university employees who may work near asbestos materials or whose activities (such as building renovation) may affect asbestos materials, OSHA Asbestos Awareness training is a requirement. Workers meeting this definition are considered Class IV workers by OSHA regulations. These workers are required to have training, plus annual refresher training, as described below:

Work that does not disturb asbestos is permitted at any time. An employee may work near asbestos containing materials, such as pipe insulation, floor tiles or even sprayed on asbestos insulation, as long as the material is not disturbed. This may include the following activities:

- Replacing or repairing electrical or other wiring
- Repairing plumbing or other facility items
- Cleaning or buffing floor tiles
- Any work done NEAR asbestos materials but not disturbing them

Work that disturbs or may disturb asbestos materials is NOT permitted. Some examples of activities that are not permitted are:

- Sanding or drilling through floor tiles or asbestos cement board
- Lifting or replacing ceiling tiles in areas where asbestos fireproofing is above the tiles
- Drilling holes in ANY asbestos material
- Moving furniture or other items that may disturb asbestos materials
- Renovating any space where asbestos materials are present
- Removing asbestos insulation or floor tiles for any reason

Performing renovations in areas where ACM is present

Environmental Health and Safety (EH&S) offers Asbestos Awareness training annually in several different sessions and dates, and targets specific areas and personnel as follows (this list is not inclusive):

<table>
<thead>
<tr>
<th>FMS</th>
<th>CDFD</th>
<th>Housing/Dining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business managers</td>
<td>Building managers</td>
<td>Telecom</td>
</tr>
</tbody>
</table>

EH&S maintains records of the training and the attendees. It is the responsibility of the managers and supervisors to ensure that necessary employees attend this required training.

Staff performing asbestos inspections, assessments or evaluations, preparing specifications, etc., must obtain training and Pennsylvania Department of Labor and Industry Licenses (L&I) appropriate for that activity. Such training must be updated, and licenses renewed, on an annual basis.
Procedure AM-6: Approved asbestos consultants/contractors/laboratories

Approval Process

Just as for any hazardous material operation, performance is of the utmost importance and cost of service is only one factor in the decision to select an outside contractor.

Therefore, the monitor for all hazardous materials operations (including lead and asbestos removal) must meet prequalification requirements and submit a performance based proposal. EH&S has reviewed the qualifications of a number of consultants and approved several for work at the university. The current list of these consultants is available from EH&S and is available on the EH&S webpage under “Facilities and Construction Safety”.

Items for submission should prove or provide evidence of the following:

a) Contractor must have a full time certified industrial hygienist on the payroll who reviews final project reports and where needed, approval of sampling and testing strategy and methodology prior to the beginning of the project. This is important in case there is litigation related to the project and we need an expert witness to defend the work performed.

b) Contractor must submit resumes for all employees, stating certifications, licenses, training, and experience.

c) The generation of accurate and precise testing results is essential for a contractor providing analytical services to the university. There are a number of proficiency registries and accreditations available to help ensure quality analytical results. At a minimum, the laboratory must demonstrate the following:

   a. For asbestos fiber counts performed in the field, all analysts must be registered by and perform successfully in the Asbestos Analysis Registry of the American Industrial Hygiene Association (AIHA).

   b. For asbestos fiber counts performed in the laboratory, and for industrial hygiene analyses (metals, organics, silica), all laboratories must be accredited by the AIHA Industrial Hygiene Laboratory Accreditation Program for these analytes as applicable.

   c. For environmental lead analyses (paint chip, soil and wipe), all laboratories must be accredited by the AIHA in the Environmental Lead Laboratory Accreditation Program (if lead is part of the project, as it often is).

   d. For asbestos bulk analyses, all laboratories must be accredited by the AIHA for this analysis or by the National Institute of Science and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos analyses.

   e. For asbestos analyses by Transmission Electron Microscopy, the laboratory must be accredited in the NIST/NVLAP for this analysis.

Demonstration of the above accreditation/registrations shall consist of supplying a copy of the current accreditation or registration AND the
submital of any applicable proficiency or round robin testing activity associated with the applicable analyte(s), for the past year.

List any citations by any regulatory body issued either to the oversight contractor or abatement contractor whom they were charged with to keep in compliance during abatement operations. This is applicable to asbestos and/or lead abatement activities.

**Current list of approved contractors**

A current listing of approved asbestos abatement contractors and asbestos consultants can be requested via safety@andrew.cmu.edu.
Procedure AM-7: Recordkeeping for asbestos activities

Recordkeeping

Thorough documentation of all asbestos management activities is a requirement of the university.

All inspection, O&M surveillance, corrective actions and abatement work must be thoroughly documented. This documentation shall include, where applicable, the written reports of inspection, surveillance and testing performed, copies of all applicable certifications, accreditations and licenses, copies of all correspondence with regulatory authorities (including notifications and permits). This information shall be retained in the EH&S offices and in the BRM archives.

All asbestos-related training performed and received by Carnegie Mellon staff shall be retained in compliance with regulatory specifications and Carnegie Mellon requirements. EH&S shall maintain all training documentation.
Procedure AM-8: *Periodic Review of the Management Program*

**Program Review**  At least annually, EH&S shall review this program to ensure that its specifications reflect the performance of asbestos management activities at Carnegie Mellon and also ensure regulatory compliance at all levels. Where applicable, changes in the procedures and/or policies shall be made. The date of the review and any updates shall appear on the written documents.
Procedure AM-9: *Database of Locations, of Abatement and Sampling Activities*

**Asbestos Location Database**

EH&$S$ maintains a database of the locations of known asbestos (and confirmed non-asbestos) materials on campus. The database may only be accessed by EH&$S$ personnel. For records requests, please email safety@andrew.cmu.edu

This database is reviewed and updated at least annually.

The database identifies the type of material, whether it is asbestos containing, its location, and any abatement history of note.

**Asbestos Activity Database**

EH&$S$ also maintains records of asbestos activity, designed to supplement the location records. For records requests, please email safety@andrew.cmu.edu
Procedure AM-10: Exposure Monitoring

**Exposure Assessment**
Any CMU employee who engages in any activity with the potential to disturb known or suspected asbestos containing material shall be monitored by breathing zone air sampling to ensure exposures are kept below the 8-hour time-weighted average Permissible Exposure Limit (PEL) of 0.1 fibers/cubic centimeter of air (f/cc) and the 30-minute Excursion Limit of 1.0 f/cc. Sampling and analysis shall be performed in accordance with OSHA-specified methodology. Prior to engaging in these activities, the employee must contact EH&S via safety@andrew.cmu.edu.

**Asbestos Exposure Records**
EH&S will maintain all asbestos air sampling records as required by the Occupational Safety and Health Administration. For records access, email EH&S via safety@andrew.cmu.edu.
Attachment 1:

Asbestos Abatement Project Activity Checklist (for CDFD use)
Asbestos Abatement Project Activity Checklist

| Applicability | Persons coordinating asbestos abatement work as part of a project, renovation or demolition activity on campus. This includes (but is not limited to):
| - FMS personnel |
| - CDFD personnel |
| - Facility Coordinators |
| - Housing |

***Environmental Health and Safety must be alerted in advance of ANY planned asbestos abatement to be performed on campus. Contact Environmental Health and Safety at safety@andrew.cmu.edu.***

| Action | There is a three step process to ensure that all renovations that occur on campus address asbestos materials in a way that complies with all applicable regulations and with University Policy. Please perform ALL of the asbestos management steps listed below: |

**Step #1** SURVEY – Perform comprehensive testing and identification of all materials that will be impacted by the activity and that potentially may contain asbestos.

- Contact EH&S to see if there is currently information for the area(s) in question
- EH&S will assist with sampling or arrange for an approved consultant to survey, sample and identify possible asbestos containing material. Ensure that a copy of any inspection or testing is forwarded to EH&S for including in the campus asbestos database.

**Step #2** REMOVAL - Contact an approved asbestos contactor to perform all necessary abatement work. Note that all asbestos to be impacted by the activity will need to be abated. Also note that University practice does not permit the covering of asbestos containing floor tile with new floor coverings of any type.

- **Permits from Allegheny County** - Projects involving more than 160 ft² of abatement will require a permit from Allegheny County. They require a 10 working day wait time prior to the start of abatement.
- **Air sampling** - If a permit is required, air sampling will be required to establish “clearance” of the area prior to it being re-occupied. Typically, five clearance air tests are mandated by the county. Any of the approved consultants will be qualified to perform the air testing.
- **Project monitoring** - If a permit is required for a project and if the asbestos to be removed is FRIABLE, additional project monitoring and air testing will be required. This activity can also be performed by the approved consultant. The work here entails having a consultant’s technician remain on site during the abatement, to ensure that proper work is performed and also to collect air samples outside the

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3 “Able to be crushed or reduced to powder with hand pressure”
work area, to ensure that there is no asbestos contamination outside the enclosed work zone. EH&S may require a daily report from the monitor.

### Step #3

**REPORTING** – Both the **Abatement Contractor** and the **Asbestos Consultant** must submit a final report. A copy of each report **must** be sent to EH&S. The reports shall include:

| **Abatement Contractor’s Report must include:** | a) A copy of the clearance inspection form from Allegheny County,  
b) A copy of the landfill receipt of the waste from the project,  
c) A copy of the permit under which the work occurred,  
d) A copy of all contractor air monitoring results, plus log in sheets and work progress forms used during the project.  
e) Discussion of any unusual issues or problems related to the project |
| **Asbestos Consultant’s Report must include:** | a) All air monitoring results (including finals) collected by the consultant.  
b) Copies of any log forms or checklists used by the consultant during the project.  
c) Discussion of any unusual issues or problems related to the project. |

1 List of approved consultants may be obtained from EH&S  
2 List of approved asbestos contractors may be obtained from EH&S  
3 “Able to be crushed or reduced to powder with hand pressure”