Chapter 27: Asbestos

Quick Start Summary

1 Who needs to know about these requirements

The requirements of Asbestos apply to workers performing asbestos work, supervisors, asbestos abatement subcontractors, area and building managers, field construction managers, the asbestos program manager, Waste Management, and the Building Inspection Office. Asbestos work includes any work performed on buildings with asbestos containing material (ACM), on vehicle brakes, or on asbestos-containing flooring. It also includes entry into areas where work is being done. The requirement to report worn flooring applies to all workers at SLAC.

2 Why

Inhaling high levels of asbestos fibers is known to cause asbestosis, lung cancer, and mesothelioma. When ACM is disturbed as a result of construction, maintenance, abatement, or normal wear and tear, asbestos fibers may become airborne. Asbestos fibers may also become airborne when released from deteriorating or damaged ACM.

3 What do I need to know

ACM known to be present in buildings is identified by signs near the entrances. Any work on ACM must be evaluated by the asbestos program manager and must be conducted only with all required controls in place, which include completing training, wearing personal protective equipment, ensuring no asbestos fibers become airborne, and contacting Waste Management to dispose of ACM. Worn asbestos-containing flooring must be reported to the building or area manager. Demolitions or renovations of buildings must be reviewed by the asbestos program manager.

4 When

These requirements take effect 6 January 2023.

5 Where do I find more information

SLAC Environment, Safety, and Health Manual (SLAC-I-720-0A29Z-001)

- Chapter 27, “Asbestos”

Or contact the program manager.
Chapter 27

Asbestos

1 Purpose

The purpose of this program is to ensure that worker exposure to asbestos remains below the permissible exposure limit (PEL) and that asbestos containing material (ACM) is properly handled and disposed of. It covers all work potentially involving ACM, from asbestos removal to cleaning flooring and replacing brake pads. It applies to workers performing asbestos work, supervisors, asbestos abatement subcontractors, area and building managers, field construction managers, the asbestos program manager, Waste Management, and the Building Inspection Office.

2 Roles and Responsibilities

Functional roles and general responsibilities for each role under this program are listed below. More detailed responsibilities and when they apply are provided in the procedures and requirements.

The roles may be performed by one or more individuals and one individual may play more than one role, depending on the structure of the organizations involved. Responsibilities may be delegated.

2.1 Worker

- Performs only asbestos work for which asbestos worker training is current and according to requirements of this chapter
- Except for employees of asbestos abatement subcontractors, never performs any Class I asbestos work, enters areas where Class I asbestos work is being performed, or assists asbestos subcontractors in performing asbestos work
- Reports flooring wear to the building manager and ensures flooring in work area is accessible during the annual wet waxing

2.2 Supervisor

- Ensures personnel are properly trained and qualified before work begins
- Notifies asbestos program manager before scheduling any Class II or Class III asbestos work

2.3 Asbestos Abatement Subcontractor

- Must be licensed in California
• Complies with all local, state, and federal regulations associated with asbestos work

2.4 Field Construction Manager
• May enter subcontractor-built asbestos containments where asbestos work is being done, subject to conditions (see Asbestos: General Requirements)

2.5 Safety Services Representative
• May enter subcontractor-built asbestos containments where asbestos work is being done, subject to conditions (see Asbestos: General Requirements)

2.6 Area / Building Manager
• Reports all damaged or otherwise disturbed ACM to the asbestos program manager (including asbestos-containing floor tiles damaged by routine use of office chairs)

2.7 Waste Management Group
• Coordinates disposal of all ACM waste and ensures waste packaging and transportation meet applicable regulatory requirements

2.8 Building Inspection Office
• Ensures that the asbestos program manager and the air quality program manager review all building renovation and demolition projects

2.9 Asbestos Program Manager
• Maintains certification as an asbestos work supervisor and carries out associated responsibilities for all asbestos work performed by SLAC employees
• Maintains certification as an asbestos building inspector
• Performs building, area, and facility inspections to characterize and identify ACM and maintains an inventory of all known ACM
• Characterizes asbestos exposure for activities performed at SLAC that may release asbestos fibers into the work environment
• Evaluates projects involving Class I, II, and III asbestos work and ensures the work is conducted to meet requirements
• Provides oversight and technical support for asbestos work performed by SLAC personnel and asbestos subcontractors
• Monitors as needed all Class II and III asbestos work sites not performed by an asbestos abatement subcontractor and maintains records of results
3 Procedures, Processes, and Requirements

These documents describe the detailed requirements for this program and how to implement them:

- **Asbestos: General Requirements** (SLAC-I-730-0A09S-034). Describes general hazard identification, work classification, and waste disposal requirements
- **Asbestos: Class II and Class III Asbestos Work Requirements** (SLAC-I-730-0A09S-035). Lists required controls for specific types of Class II and Class III asbestos work
- **Asbestos: Vehicle Brake Work Requirements** (SLAC-I-730-0A09S-005). Describes required controls for vehicle brake work
- **Asbestos: Asbestos Flooring Requirements** (SLAC-I-730-0A09S-006). Describes how to identify worn asbestos flooring and how to mitigate damage
- **Asbestos: Posting Requirements** (SLAC-I-730-0A09S-012). Describes posting requirements for asbestos hazards

These are the forms and tools for this program:

- **Asbestos Inventory**. Database containing building-specific information on the presences of asbestos

4 Training

4.1 Class IV or Unclassified Asbestos Worker

Workers who perform Class IV or unclassified asbestos work, such as vehicle brake and clutch replacement or cleaning and waxing of asbestos-containing floor tiles, must complete the following course:

- ESH Course 150, Asbestos Awareness ([ESH Course 150](#))

4.2 Class II and Class III Asbestos Worker

Workers who perform Class II and Class III asbestos work must complete the following courses before performing any such work:

- ESH Course 105, Hazardous Waste Management ([ESH Course 105](#))
- ESH Course 152, Asbestos Class II and III Initial Training ([ESH Course 152](#)) (every 12 months)

Required annual retraining must be completed thereafter:

- ESH Course 105R, Haz Waste Management Refresher ([ESH Course 105R](#)) (every 12 months)
- ESH Course 151, Asbestos Class II and III Refresher Training ([ESH Course 151](#)) (every 12 months)

Workers who perform only abatement activities on asbestos-containing electric cables must complete the following course instead of ESH Course 152 and 151:

- ESH Course 153, Limited Class II Asbestos - Abatement of Asbestos Cables ([ESH Course 153](#)) (every 12 months)
4.3 Area / Building Manager

Area and building managers must complete the following course:

- ESH Course 150, Asbestos Awareness (ESH Course 150)

4.4 Field Construction Manager

Field construction managers (FCMs) who oversee projects that include asbestos removal must complete the following course:

- ESH Course 150, Asbestos Awareness (ESH Course 150)

4.5 Asbestos Program Manager

To meet regulatory requirements (40 CFR 763) the asbestos program manager must complete the following certification courses and maintain certification by completing eight-hour refresher courses for the following functions annually:

- Building inspector
- Management planner
- Supervisor

5 Definitions

*abatement*. Procedures to control fiber release from ACM, including removal, encapsulation, and enclosure of ACM

*asbestos*. The asbestiform varieties of chrysotile, amosite, crocidolite, tremolite, anthophyllite, actinolite in any form, chemically treated and/or altered

*asbestos abatement subcontractor*. A registered contractor licensed by the state of California to perform asbestos work

*asbestos containing material (ACM)*. Any material containing asbestos in an amount greater than one percent by weight

*asbestos flooring*. Resilient floor covering (asbestos-containing floor tiles, including asphalt and vinyl asbestos tile and sheet vinyl floor covering) containing more than one percent asbestos

*asbestos, friable*. ACM which can be crumbled, pulverized, or reduced to powder when dry, by hand pressure

*asbestos work*. The classification for asbestos work is

- *Class I*. Asbestos operations and activities involving the removal of *thermal system insulation (TSI)* and surfacing ACM and potential ACM
• **Class II.** Asbestos operations and activities involving the removal of ACM which is not friable asbestos, TSI or surfacing material, such as floor tiles, wallboard, and transite board

• **Class III.** repair and maintenance operations where ACM, including TSI and surfacing ACM and potential ACM, is likely to be disturbed

• **Class IV.** maintenance activities during which employees contact but do not disturb, cut, or damage ACM or potential ACM

• **Unclassified.** changing vehicle brakes or clutches (under a certain limit) or cleaning or waxing asbestos floor tiles

**demolition.** Wrecking, intentional burning, moving or dismantling of any load-supporting structural member, or portion thereof, of a building or facility

**permissible exposure limit (PEL).** “The maximum permitted 8-hour time-weighted average concentration” (8 CCR 5155) for a specific substance. Workers may not be exposed to concentrations over this limit. At SLAC the PEL for asbestos is 0.1 fibers per cubic centimeter, as set forth in 8 CCR 5208.

**renovation.** An operation other than demolition in which potential ACM is removed or stripped from any element of a building, structure, installation, or portion thereof

**thermal system insulation (TSI).** Material in a building applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes

## 6 References

### 6.1 External Requirements

The following are the external requirements that apply to this program:


## 6.2 Related Documents

[SLAC Environment, Safety, and Health Manual](SLAC-I-720-0A29Z-001) (SLAC-I-720-0A29Z-001-R023.7)

• Chapter 17, “Hazardous Waste”
• Chapter 29, “Respiratory Protection”
• Chapter 30, “Air Quality”
  – Air Quality: Asbestos Notification Procedure (SLAC-I-730-0A16C-001)
• Chapter 56, “Respirable Crystalline Silica”
Chapter 27: Asbestos

General Requirements

1 Purpose

The purpose of these requirements is to ensure that asbestos work is accurately classified and that only trained and qualified personnel handle, remove, or otherwise disturb asbestos containing material (ACM). They cover the identification of potential ACM, the classification of asbestos work, and the management of asbestos waste. They apply to workers performing asbestos work and their supervisors, area and building managers, the asbestos program manager, Waste Management, and the Building Inspection Office.

2 Requirements

2.1 Hazard Identification

The asbestos program manager must inspect each building at least once for asbestos and document the results in the Asbestos Inventory. The asbestos program manager will ensure that the potential for an asbestos hazard is communicated to building and area managers and that the required warning signs are posted, as described in Asbestos: Posting Requirements. Building and area managers must report damage to any ACM to the asbestos program manager (see Asbestos: Asbestos Flooring Requirements).

A job-specific inspection is required before every demolition or any renovation involving asbestos work. To this end, the Building Inspection Office (BIO) ensures that the asbestos program manager and the air quality program manager review all building renovation and demolition projects.

2.2 Work Classification and Requirements by Class

Asbestos work is classified as follows.

2.2.1 Class I Asbestos Work or Work that Requires an Asbestos Work Notification

Class I asbestos work and any work that requires a Bay Area Air Quality Management District (BAAQMD) work notification may only be performed by an asbestos abatement subcontractor. All other workers are prohibited from performing Class I work and from entering any area where Class I asbestos work is being performed.

The notification process is described in Air Quality: Asbestos Notification Procedure. It is required for
2.2.2 Class II and Class III Asbestos Work

Class II and Class III asbestos work must be evaluated by the asbestos program manager before work begins and may only be performed by trained and qualified SLAC personnel or asbestos abatement subcontractors. See Asbestos: Class II and Class III Asbestos Work Requirements for required controls for such asbestos work as

- Removing electric cable
- Removing floor tiles
- Removing asbestos cement (transite) siding and roofing products
- Cutting asbestos cement (transite) pipe
- Removing wallboard
- Drilling into floor tiles
- Roof core removal, roof cutting

The asbestos program manager performs work site monitoring as needed for all Class II and III asbestos work not performed by an asbestos abatement subcontractor.

2.2.3 Class IV and Unclassified Asbestos Work

Class IV and unclassified asbestos work can only be performed by trained and qualified personnel.

- Class IV work includes maintenance activities during which employees contact but do not disturb, cut, or damage ACM or potential ACM
- Unclassified asbestos work includes changing vehicle brakes and clutches in a transportation shop in which five or fewer brakes are changed per week. (For requirements see Asbestos: Vehicle Brake Work Requirements.) It also includes cleaning or waxing asbestos-containing floor tiles.

2.3 Waste Management

All asbestos-containing waste must be managed by Waste Management, which must be contacted before conducting any work that could produce asbestos waste.

3 Forms

The following forms and systems are required by these requirements:

- Asbestos Inventory. Database containing building-specific information on the presences of asbestos
4 Recordkeeping

The following recordkeeping requirements apply for these requirements:

- The asbestos program manager is responsible for maintaining the Asbestos Inventory.
- The asbestos program manager maintains work site monitoring results for all Class II and III asbestos work not performed by an asbestos abatement subcontractor.

5 References

**SLAC Environment, Safety, and Health Manual** (SLAC-I-720-0A29Z-001)

- Chapter 27, “Asbestos”
  - Asbestos: Class II and Class III Asbestos Work Requirements (SLAC-I-730-0A09S-035)
  - Asbestos: Vehicle Brake Work Requirements (SLAC-I-730-0A09S-005)
  - Asbestos: Asbestos Flooring Requirements (SLAC-I-730-0A09S-006)
  - Asbestos: Posting Requirements (SLAC-I-730-0A09S-012)
- Chapter 17, “Hazardous Waste”
- Chapter 30, “Air Quality”
  - Air Quality: Asbestos Notification Procedure (SLAC-I-730-0A16C-001)

Other SLAC Documents

- Waste Management

Other Documents

Chapter 27: Asbestos

Class II and Class III Asbestos Work Requirements

1 Purpose

The purpose of these requirements is to ensure that worker exposure to asbestos remains below the permissible exposure limit (PEL) and that asbestos waste is properly handled and disposed of. These requirements cover Class II and Class III asbestos work and waste management and apply to workers and supervisors performing such work and the asbestos program manager.

2 Requirements

2.1 Monitoring

The asbestos program manager performs work site monitoring as needed for all Class II and III asbestos work not performed by an asbestos abatement subcontractor.

2.2 Listed Activities

All buildings and facilities built before 1981 are presumed to contain asbestos. Asbestos containing material (ACM) or potential asbestos containing material (PACM) used in the construction of SLAC buildings and facilities include:

- Roofing material and patching compound
- Wallboard and joint compound
- Floor tiles, sheet flooring, and floor tile mastic
- Vehicle brake and clutch parts
- Glues and adhesives
- Acoustic ceiling and wall tiles
- Fire doors
- Electric cables
- Transite pipe and board
- Wall and ceiling insulation
- Machine and piping gaskets, vibration cloth, and cooling tower baffles
- Thermal system insulation (TSI) such as cement elbows and pipe wrap

For building-specific asbestos hazard information, see the Asbestos Inventory and/or contact the asbestos program manager.

The asbestos program manager has determined by air sampling that the following Class II and III asbestos work activities on buildings can be conducted without exceeding the PEL (negative exposure assessment). Nevertheless, all asbestos work must first be evaluated by the asbestos program manager – in particular any asbestos work not listed below.

<table>
<thead>
<tr>
<th>Asbestos Work Activity</th>
<th>Required Controls</th>
<th>Waste Disposal</th>
</tr>
</thead>
</table>
| All Class II and III work | - Contact asbestos program manager before beginning work (air sampling will be conducted as needed)  
- The authorizing supervisor and workers must be current in all required asbestos training  
- Do not use power tools except as noted below  
- Wear gloves  
- Clean wet dust with wet disposable towels promptly (do not allow any dust to dry or disperse)  
- **Additional controls as listed by activity below** | Obtain hazardous waste containment from Waste Management (WM) as appropriate  
- Polyethylene waste bag, six millimeter thick (no DOT markings allowed)  
- Drums, bins, hoppers  
Objects too large for a waste bag must be “burrito wrapped” with six millimeter polyethylene sheet (obtain from SLAC stores)  
Used gloves and disposable towels must be bagged with other asbestos waste.  
All asbestos waste must be disposed of by WM. |
| Removing floor tiles | - Limit work to two hours per day or one waste bag  
- Use spray bottle with soapy water to wet floor before and after removing floor tiles | Fill waste bag no more than half full |
| Removing transite panels (30 percent asbestos) | - Wet bolts using spray bottle with soapy water as they are being removed | Avoid breaking panels; collect wet dust with a paper towel |
| Cutting transite pipe | - Use only manual tools with a chain pipe cutter (snap cutter); do not use power tools  
- Keep surfaces wet during work (use water hose) | If too large for waste bag, “burrito wrap” and label  
Contact WM for guidance on proper storage and containment |
| Removing wallboard | - Asbestos program manager must be present during work to take air samples | If too large for waste bag, “burrito wrap” and label |
### Asbestos Work Activity

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>▪ Asbestos Inventory</td>
<td>Database containing building-specific information on the presence of asbestos</td>
<td>Contact WM for guidance on proper storage and containment</td>
</tr>
<tr>
<td>▪ Drilling into floor tiles</td>
<td>Limit number of holes drilled to 30 per day</td>
<td>Collect wet dust with a paper towel</td>
</tr>
<tr>
<td>▪ Roof core removal, roof cutting</td>
<td>Wet the surface before, during, and after cutting/drilling using spray bottle with soapy water</td>
<td>Collect wet dust with a paper towel</td>
</tr>
<tr>
<td>▪ Removing electric cables</td>
<td>Tape and wet the area that needs to be cut</td>
<td>Fill waste bag no more than half full</td>
</tr>
<tr>
<td></td>
<td>Minimize cable movement</td>
<td></td>
</tr>
</tbody>
</table>

### 3 Forms

The following forms and systems are required by these requirements:

- **Asbestos Inventory**: Database containing building-specific information on the presence of asbestos

### 4 Recordkeeping

The following recordkeeping requirements apply for these requirements:

- The asbestos program manager maintains work-site monitoring results for all Class II and III asbestos work not performed by an asbestos abatement subcontractor.

### 5 References

**SLAC Environment, Safety, and Health Manual** (SLAC-I-720-0A29Z-001)

- Chapter 27, “Asbestos”
- Chapter 17, “Hazardous Waste”
Chapter 27: Asbestos

Vehicle Brake Work Requirements

1 Purpose

The purpose of these requirements is to ensure that worker exposure to asbestos remains below the permissible exposure limit (PEL) and to ensure that asbestos waste is disposed of properly. These requirements cover unclassified asbestos work in a transportation shop in which a maximum of five pairs of brakes or five clutches are inspected, disassembled, repaired, or assembled per week. These requirements apply to workers who repair cranes and vehicle brakes and their supervisors.

2 Requirements

The worker must

- Be current in asbestos training: ESH Course 150, Asbestos Awareness (ESH Course 150)
- Obtain required asbestos waste bags from Waste Management
- Wear gloves
- Use the brake and clutch repair kit (soapy water spray bottle/paper towels/asbestos waste container) to wet brake or clutch parts
- Clean dust with wet disposable towels and place disposable towels and used gloves, along with the generated waste, into the hazardous waste bag
- Not use a brush during water spraying
- Not cause any asbestos fibers to become airborne, including not using compressed air or a shop vacuum

3 Forms

The following forms and systems are required by these requirements:

- None

4 Recordkeeping

The following recordkeeping requirements apply for these requirements:

- None
5 References

SLAC Environment, Safety, and Health Manual (SLAC-I-720-0A29Z-001)
- Chapter 27, “Asbestos”
- Chapter 17, “Hazardous Waste”
  - Hazardous Waste: Industrial Waste Requirements (SLAC-I-750-0A08S-003)

Other SLAC Documents
- ESH Course 150, Asbestos Awareness (ESH Course 150)
- Waste Management
1 Purpose

The purpose of these requirements is to ensure asbestos-containing flooring (including asphalt and vinyl asbestos tile and sheet vinyl) are properly maintained. They cover the identification of asbestos-containing flooring that may need to be replaced and the prevention of floor wear. They apply to workers, supervisors, and area and building managers in occupied areas with flooring that may contain asbestos.

2 Requirements

2.1 Hazard Identification

Asbestos-containing flooring may contain asbestos. Such flooring must be maintained in good condition because asbestos fibers may become liberated when certain types of hard chair casters grind into the floor tiles during normal use. To determine whether a building is known to contain asbestos flooring, check the Asbestos Inventory.

*Note* The wear pattern made by office chair casters is usually a circular area under the chair where tiles appear dull, un-waxed, white, or grainy.

Air sampling by SLAC industrial hygienists has demonstrated that asbestos dust from worn floor tiles is not entering worker breathing zones during office activities or during flooring replacement. Nevertheless, any apparent wear must be reported to the building manager immediately for assistance in resolving potential problems.

2.2 Managing Flooring Wear

Wear caused by hard chair casters can be mitigated by

- Waxing floors once each year using a wet method adequately seals flooring dust
- Choosing chair casters intended for wood floors; recommended because they are softer than those intended for carpet and decrease wear

Building managers must notify the asbestos program manager whenever flooring damage is observed or reported to identify appropriate controls, which may include

- Protecting the worn area with a hard plastic mat
- Not dry sweeping worn areas (avoids the potential for getting dust in the air)
- Waxing the floor or worn area using a wet method
- Rearranging the furniture to avoid further wear on worn flooring
- Replacing chair casters as appropriate; the asbestos program manager can help determine what type of caster is currently in place
- Replacing flooring worn by chair casters: not recommended unless the flooring is broken or cracked

Any hard casters identified as causing floor damage may not be salvaged for reuse on-site.

All workers must ensure their work area is accessible during the annual wet waxing.

3  Forms

The following forms and systems are required by these requirements:
- **Asbestos Inventory.** Database containing building-specific information on the presences of asbestos

4  Recordkeeping

The following recordkeeping requirements apply for these requirements:
- The asbestos program manager will maintain records of notifications of damaged asbestos flooring in the **Asbestos Inventory**.
- Documentation will be retained regarding asbestos flooring removal work done by SLAC employees.
- An annual report will be completed detailing the location and amount asbestos flooring removal and the workers who performed it.

5  References

**SLAC Environment, Safety, and Health Manual** (SLAC-I-720-0A29Z-001)
- **Chapter 27, “Asbestos”**
Chapter 27: Asbestos

Posting Requirements

1 Purpose

The purpose of these requirements is to ensure that personnel who perform work on buildings are aware that asbestos containing material (ACM) is present. They cover areas where ACM is present and apply to the asbestos program manager and area and building managers.

2 Requirements

The asbestos program manager will ensure that an asbestos warning sign is conspicuously posted on or near the main entrance(s) of any building or facility that contains ACM.

The sign must provide information about the hazards present and actions that must be taken as follows:

MATERIALS IN THIS BUILDING CONTAIN ASBESTOS FIBERS AND SHOULD NOT BE REMOVED, CUT, OR DRILLED.

Detailed information regarding the location and type of ACM should be included.

Building and area managers are responsible for informing the asbestos program manager of any proposed changes that involve ACM in the area.

See an example posting below. To view currently posted signs, see the Asbestos Inventory.
NOTICE

Materials in this building contain asbestos fibers and should not be removed, cut or drilled.

Airborne asbestos fibers can pose a substantial health hazard including cancer and lung disease.

Figure 1  Sample Asbestos Warning Sign

3 Forms

The following forms and systems are required by these requirements:

- Asbestos Inventory. Database containing building-specific information on the presences of asbestos

4 Recordkeeping

The following recordkeeping requirements apply:

- The asbestos program manager ensures that for any building or facility that contains ACM an image of the posted sign is entered in the Asbestos Inventory.

5 References

SLAC Environment, Safety, and Health Manual (SLAC-I-720-0A29Z-001)

- Chapter 27, “Asbestos”