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, field construction managers, Field Services representatives, building and area managers, and the program manager; and 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 floor tiles. It also includes entry into areas where work is being done. The requirement to report worn floor tiles 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 floor tiles 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 3 February 2016.

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 floor tiles and replacing brake pads. It applies to workers, supervisors, asbestos abatement subcontractors, field construction managers, Field Services representatives, building and area managers, and the program manager; and Waste Management and the Building Inspection Office.

2 Roles and Responsibilities

Functional roles and general responsibilities for each role 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 floor tile wear to the building manager and ensures floors 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 / Field Services Representative

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

2.5 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)

2.6 Waste Management Group

- Coordinates disposal of all ACM waste and ensures waste packaging and transportation meet applicable regulatory requirements

2.7 Building Inspection Office

- Ensures that the asbestos program manager and the air quality program manager review all building renovation and demolition projects

2.8 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 list the core requirements for this program and describe how to implement them:
Asbestos: General Requirements (SLAC-I-730-0A09S-034). Describes 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 brake work

Asbestos: Office Floor Tile Requirements (SLAC-I-730-0A09S-006). Describes requirements for minimizing floor wear

Asbestos: Posting Requirements (SLAC-I-730-0A09S-012). Describes posting requirements

Asbestos Inventory. Database listing known ACM by building number

4 Training

4.1 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

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)

Required annual retraining must be completed thereafter:

- ESH Course 105R, Haz Waste Management Refresher (ESH Course 105R)
- ESH Course 151, Asbestos Class II and III Refresher Training (ESH Course 151)

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 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)

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

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

*Insulation, thermal system (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

*Limit, permissible exposure (PEL).* A limit for personal exposure to a substance. The OSHA eight-hour PEL for asbestos is 0.1 fibers per cubic centimeter

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

*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

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

*Work, asbestos.* The federal Occupational Health and Safety Administration (OSHA) classification designations for asbestos work are

- **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
6 References

6.1 External Requirements

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


- Bay Area Air Quality Management District (BAAQMD), Regulation 11, “Hazardous Pollutants”, Rule 2, “Asbestos Demolition, Removal and Manufacturing” (BAAQMD 11.2)

The following standards apply to asbestos abatement subcontractors:

  - Section 1529, “Asbestos” (8 CCR 1529)
  - Section 1531, “Respiratory Protective Equipment” (8 CCR 1531)

6.2 Related Documents

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

- Chapter 17, “Hazardous Waste”
- Chapter 30, “Air Quality”
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, supervisors, asbestos abatement subcontractors, field construction managers, Field Services representatives, building and area managers, and the program manager; and 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: Office Floor Tile 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 by the federal Occupational Safety and Health Administration (OSHA).

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 (unless a field construction manager or Field Services representative, as described in Section 2.2.4.1, “Entry into Subcontractor Containments”).
The notification process is described in Air Quality: Asbestos Notification Procedure. It is required for
- All demolition projects
- Renovations involving the abatement of friable ACM (or ACM that will become friable during removal) in amounts greater than or equal to 100 linear feet, 100 square feet, or 35 cubic feet
- Planned or actual renovations occurring within a time frame of no less than 30 days and no more than one year in which the total ACM removed is predicted to add up to a reportable quantity

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 can 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 transite panels (30 percent asbestos)
- Cutting 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 Asbestos Work

*Class IV asbestos work* can only be performed by trained and qualified personnel. Class IV asbestos work includes maintenance activities during which employees contact but do not disturb, cut, or damage ACM or potential ACM, for example cleaning or waxing asbestos-containing floor tiles.

2.2.4 Unclassified Asbestos Work

*Unclassified asbestos work* can only be performed by trained and qualified personnel. 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)
- Entry into subcontractor containments, for the purpose of carrying out inspections and oversight (see below)

2.2.4.1 Entry into Subcontractor Containments

Access to subcontractor-built asbestos containments where asbestos work is being done is restricted to qualified subcontractor workers. Field construction managers (FCMs) and representatives of the Field Services Department are allowed to access these areas, subject to the following conditions:
The FCM/Field Services representative must

- Be current in asbestos training (ESH Course 150)
- Avoid entry if possible by the use of viewports in containments, remote video, or other means
- Wear a P-100 half mask respirator (or better) while inside of a containment. This requires authorization to use a respirator, including all required training and a fit test with the P-100 respirator (see Chapter 29, “Respiratory Protection”).
- Wear disposable Tyvek coveralls
- Wear all required personal protective equipment as signs on the containment require
- Make entry into the work area brief, not more than 15 minutes at a time, with a minimum 15 minute break before reentering, and not more than three times per day
- Notify the SLAC asbestos program manager of entry into asbestos containments. Air sampling for the PEL and the 30 minute excursion level may be required.
- Not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area
- Not approach closely to work where asbestos is being disturbed

### 2.3 Waste Management

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

### 3 Forms

The following forms are required by these requirements:

- Asbestos Inventory

### 4 Recordkeeping

The following recordkeeping requirements apply:

- 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: Office Floor Tile Requirements (SLAC-I-730-0A09S-006)
Asbestos: Posting Requirements (SLAC-I-730-0A09S-012)

- Chapter 29, “Respiratory Protection”
- Chapter 30, “Air Quality”
  - Air Quality: Asbestos Notification Procedure (SLAC-I-730-0A16C-001)

Other SLAC Documents

- ESH Course 150, Asbestos Awareness (ESH Course 150)
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  
- Limit work so that none of these conditions are exceeded on any one day: one hour work, one bag of waste, a few square | If too large for waste bag, “burrito wrap” and label  
Contact WM for guidance on proper storage and containment |
Asbestos Work Activity | Required Controls | Waste Disposal
--- | --- | ---
feet of wall board removed | • Wet area with spray bottle or Hudson sprayer with soapy water to wet before, during, and after wallboard removal  
• Remove in large pieces if possible  
• Do not break up wall board unless necessary | containment
Drilling into floor tiles | • Limit number of holes drilled to 30 per day  
• Wet floor before drilling using spray bottle with soapy water and to wet dust after drilling | Collect wet dust with a paper towel
Roof core removal, roof cutting | • Wet the surface before, during, and after cutting/drilling using spray bottle with soapy water  
• Limit number of cores drilled to 20 per day | Collect wet dust with a paper towel
Removing electric cables | • Tape and wet the area that needs to be cut  
• Minimize cable movement | Fill waste bag no more than half full

3 Forms

The following forms are required by these requirements:
- None

4 Recordkeeping

The following recordkeeping requirements apply:
- 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) (SLAC-I-720-0A29Z-001)
- Chapter 27, “Asbestos”
  - Asbestos Inventory
- 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 pair of brakes or five clutches are inspected, disassembled, repaired, or assembled per week. These requirements apply to workers who repair cranes and vehicles 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 the Waste Management Group
- 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

None

4 Recordkeeping

None
5 References

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

Office Floor Tile Requirements

1 Purpose

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

2 Requirements

2.1 Hazard Identification

Asbestos-containing floor tiles and flooring may contain up to five percent 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 floor tiles, 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 floor tile replacement. Nevertheless, any apparent wear must be reported to the building manager immediately for assistance in arresting a potential problem.

2.2 Managing Tile Wear

Wear caused by hard chair casters can be mitigated by

- Waxing floors once each year using a wet method adequately seals floor tile dust
- Choosing chair casters intended for wood floors are recommended because they are softer than those intended for carpet and decrease wear. (Such casters cost about $25 for a set of five casters per chair.)

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

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

None

4 Recordkeeping

None

5 References

SLAC Environment, Safety, and Health Manual (SLAC-I-720-0A29Z-001)
- Chapter 27, “Asbestos”
  - Asbestos Inventory
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 building and area managers of such areas.

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.
DANGER

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.

NOTICE

Figure 1  Sample Asbestos Warning Sign

3  Forms

The following forms are required by these requirements:

- Asbestos Inventory

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”