

**California Institute of Technology**

# **ASBESTOS MANAGEMENT PROGRAM**



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## **Introduction**

Caltech has a number of procedures in place for identifying and managing asbestos-containing building materials. These procedures have been developed to ensure that no one is exposed to an airborne concentration of asbestos fibers exceeding specified standards during the course of their work at the Institute.

## **Asbestos Management**

The Environment, Health, and Safety (EHS) Office coordinates with Facilities Design and Construction, Facilities Management, and Housing to ensure that Asbestos-Containing Materials (ACM) are properly identified and managed prior to any planned work likely to disturb them.

Several EHS staff members are trained and certified as Asbestos Building Inspectors (ABIs) by an outside Cal/OSHA-approved training provider. EHS activities may include:

- Collecting bulk samples of suspected or presumed asbestos-containing materials, and submitting these samples to an accredited laboratory for analysis;
- Conducting asbestos exposure assessments and air monitoring of Caltech employees who perform small-scale asbestos work;
- Performing work area monitoring as deemed necessary; and
- Providing asbestos sampling results to Caltech managers and employees.

The Facilities Design and Construction project managers select, manage, and oversee the work of Cal/OSHA-registered asbestos abatement contractors who perform all of the large-scale (>100 square feet) asbestos abatement projects on campus. Facilities Design and Construction hires outside Certified Asbestos Consultants (CACs) and Certified Site Surveillance Technicians (CSSTs), who are trained and certified by an outside Cal/OSHA-approved training provider, to develop the asbestos work plan and to perform bulk sampling, perimeter and clearance air sampling, and oversight of contractors on these large-scale projects.

The Facilities Department maintains a group of employees, primarily plumbers and Heating, Ventilating, and Air-Conditioning (HVAC) mechanics, who are trained and certified by an outside Cal/OSHA-approved training provider to the initial 16-hour and annual 4-hour Class III Asbestos Operations and Maintenance (O&M) level for safely working with asbestos-containing materials while performing small-scale emergency maintenance and repair work (e.g., single glove bag, less than 100 square feet of ACM)

that may disrupt the matrix, crumble or pulverize, or generate visible debris from ACM or PACM.

Any disturbance of ACM or PACM by these Class III-trained Facilities Department employees will be limited to cutting away and/or removing small amounts of ACM and PACM, no greater than the amount which can be contained and disposed of in one standard-sized glove bag or waste bag (i.e., 60 inches in length by 60 inches in width), in order to access a building component for repair or replacement. These employees are also medically evaluated, trained, and fit tested to wear respiratory protection during this glove bag work.

All building occupants are cautioned not to disturb or touch damaged building materials within their work areas, and to report any damaged materials immediately to the EHS Office.

## **Asbestos Notification**

Caltech annually notifies all employees about the presence of asbestos-containing building materials on campus. [See Appendix VI.](#)

Asbestos warning signs or labels are required to be posted at the entrances to mechanical rooms/areas which contain thermal system insulation and surfacing ACM and/or PACM.

## **Asbestos Report of Use**

Caltech has filed a written report of its use of a regulated carcinogen (i.e., asbestos) with the Chief of the Division of Occupational Safety and Health (DOSH) or Cal/OSHA as part of the Caltech Regulated Carcinogen Program.

## **Procedures for Asbestos-Related Work Activities**

The EHS Office has developed the following procedures for identifying and managing asbestos-containing materials (ACM) which may be disturbed during any of the following activities:

- Demolition
- Construction
- Utility Installation
- Operation, Repair, and Maintenance Activities

The procedures summarized below shall be conducted prior to the start of work where ACM may be impacted or disturbed.

Step	Procedure	Responsible Department(s)
1.	Determine if ACM will be disturbed by the job. <ul style="list-style-type: none"> <li>✓ Check through “Appendix II-List of Common Asbestos-Containing Materials” and “Appendix III-List of Caltech Buildings Built Prior to 1980”.</li> <li>✓ If any of the listed materials or products are present or suspected, contact EHS at ext.6727.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facilities Management</li> <li>▪ Facilities Design and Construction</li> <li>▪ Housing</li> </ul>
2.	Survey the work area. <ul style="list-style-type: none"> <li>✓ Conduct a visual inspection of the area where work will be conducted.</li> <li>✓ Collect bulk samples of any suspected materials that may be disturbed.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facilities Management</li> <li>▪ Facilities Design and Construction</li> <li>▪ Housing</li> <li>▪ Environment, Health, and Safety</li> </ul>
3.	Notify requesting department about sample results. <ul style="list-style-type: none"> <li>✓ Written report, including sample results and recommended actions, shall be sent to the Facilities Design and Construction Project Manager.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environment, Health, and Safety</li> </ul>
4.	Document results of sample analysis and location of ACM in written scope of work in asbestos work plan. <ul style="list-style-type: none"> <li>✓ Communicate to all employees or contractors working in the area about the presence and location of identified ACM.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facilities Management</li> <li>▪ Facilities Design and Construction</li> <li>▪ Housing</li> </ul>
5.	Proceed with job <ul style="list-style-type: none"> <li>✓ EHS is available for consultation and assistance as needed.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facilities Management</li> <li>▪ Facilities Design and Construction</li> <li>▪ Housing</li> </ul>
6.	When ACM needs to be abated prior to work: <ul style="list-style-type: none"> <li>✓ Only pre-screened Cal/OSHA-registered Asbestos Abatement Contractors shall be used.</li> <li>✓ Any air sampling results generated by a contractor (inside containment) or a consultant (outside containment) during abatement shall be forwarded to EHS.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facilities Management</li> <li>▪ Facilities Design and Construction</li> <li>▪ Housing</li> </ul>
7.	Any hazardous waste, including asbestos-containing material, shall be disposed of in accordance with EHS procedures. <ul style="list-style-type: none"> <li>✓ All Hazardous Waste Manifests shall be signed by EHS as the generator representative.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facilities Management</li> <li>▪ Facilities Design and Construction</li> <li>▪ Housing</li> <li>▪ Environment, Health, and Safety</li> </ul>

# Appendix I: Asbestos-Containing Materials

The EPA has classified all asbestos-containing materials into three categories:

1. Thermal System Insulation (TSI)
2. Surfacing Materials
3. Miscellaneous Materials

## Thermal System Insulation

Insulation used on mechanical systems to prevent heat loss or gain and condensation. Steam and hot water lines, boiler tanks, expansion joints, fittings and other mechanical systems are commonly insulated with pre-fabricated asbestos-containing materials. The material is typically gray or off-white in color and encased in a plaster-impregnated canvas wrapping.

Asbestos-containing mud compounds are often used on elbows, valves, identification plates, miscellaneous fittings, and for other special applications on mechanical systems.

## Surfacing Materials

ACM sprayed or troweled onto surfaces for acoustical, decorative, or fireproofing purposes.

Asbestos has been blended into spray-applied and troweled-on products including:

- Structural fireproofing
- Stucco
- Plaster
- Acoustical and decorative surfaces
- Joint compounds

Spray-applied structural fireproofing has been applied to structural steel (e.g., I-beams, metal decking underneath roof and between floors, etc.), building shafts, and over-sprayed onto other building members. The off-white or gray material is either hard and granular in form, or soft and fluffy.

There are instances where exterior stucco, interior acoustical surfaces (e.g., “cottage cheese” ceiling), and joint compounds used for seaming gypsum wall boards together, have been identified as asbestos-containing materials, and may be present in some campus buildings.

## Miscellaneous Materials

Products not utilized as TSI or surfacing materials are classified as miscellaneous materials. Following is a list of some examples:

- Cement (Transite) pipes
- Ceiling tiles
- Mastic (used as glue or adhesive on floor or ceiling tiles)
- Fire doors
- Gaskets
- Vinyl floor covering (9" x 9" floor tiles and linoleum)
- Ductwork flexible connections
- Electrical wiring insulation
- Roofing felt
- Roofing flashing
- Laboratory fume hood ducting and paneling

## Appendix II

### List of Common Asbestos-Containing Materials

The following list has been developed as a quick reference for commonly encountered ACM. This list does not include every product or material that may contain asbestos. It is intended as a general guide to highlight which types of materials should be considered suspect.

Acoustical plaster	Heating ducts
Asphalt floor tile	High temperature gaskets
Blown-in insulation	HVAC duct insulation
Boiler insulation	Joint compounds
Ceiling tiles	Laboratory bench tops
Cement (Transite) pipes	Laboratory thermal gloves
Cement siding	Laboratory fume hoods
Cement wallboard	Mastics (flooring, ceiling, etc.)
Chalkboards	Pipe insulation
Cooling towers	Roofing felt
Decorative plaster	Roofing shingles
Electrical cloth	Spackling compounds
Electrical panels	Spray-applied insulation
Electrical wiring insulation	Textured paints and coatings
Elevator brake shoes	Thermal taping compounds
Fire blankets	Vinyl floor tile
Fire doors	Vinyl sheet flooring
Fireproofing	Wallboard



## Appendix III

### List of Caltech Buildings Built Prior to 1980

Thermal system insulation (TSI) and surfacing materials installed prior to 1980 must be identified as Presumed Asbestos-Containing Materials (PACM) until bulk testing of suspected materials proves otherwise. Below is a list of those Caltech buildings that were built prior to 1980. This list is intended as a guide for campus buildings that may contain asbestos. Suspected materials found in buildings not on this list should still be tested to determine if the materials are asbestos containing.

Alles Laboratory	Kerckhoff Laboratory
Alumni House	Lauritsen Laboratory
Arms Laboratory	Lloyd House
Athenaeum	Marks House
Baxter Hall	Mead Laboratory
Beckman Auditorium	Millikan Laboratory
Beckman Behavioral Biology	Mudd Laboratory, North
Blacker House	Mudd Laboratory, South
Braun House	Noyes Laboratory
Bridge (East, West, Annex)	Page House
Brown Gymnasium	Parsons-Gates
Center for Student Services	Powell-Booth Laboratory
Central Engineering Services	Public Events Ticket Office
Central Plant	Public Relations
Chandler Dining Hall	Ricketts House
Church Laboratory	Robinson Laboratory
Crellin Laboratory	Ruddock House
Dabney Hall	Safety Annex
Dabney House	Sloan Annex
Downs Laboratory	Sloan Laboratory
Facilities Management	South Hill Buildings
Firestone Laboratory	South Wilson Buildings
Fleming House	Spalding Laboratory
Gates Annex	Steele Laboratory
Guggenheim Laboratory	Synchrotron Laboratory
Industrial Relations	Thomas Laboratory
Isotope Laboratory	Transportation Center
Jorgensen Laboratory	Winnett Student Center
Karman Laboratory	Young Health Center
Keith Spaulding	S. Wilson Properties
Kellogg Laboratory	S. Hill Properties

## **Appendix IV: Registered Asbestos Abatement Contractors**

Registration with Cal/OSHA is required for contractors who remove 100 square feet or more of surface area of asbestos-containing building materials that have an asbestos content of more than 0.1%.

Due to the nature of asbestos abatement work, only Cal/OSHA-registered contractors can perform large-scale (>100 ft<sup>2</sup>) asbestos abatement project work at the Institute. This ensures that asbestos abatement contractors have all required training, licensing, and insurance to conduct asbestos abatement work. If a contractor does not have the required credentials or insurance, then they are not allowed to perform asbestos abatement work on campus.

Asbestos abatement contractors are responsible for completing and submitting any required South Coast Air Quality Management District (SCAQMD) and California Occupational Safety and Health Administration (Cal/OSHA) asbestos work notifications, and providing copies of these notification forms to the Facilities Design and Construction project managers.

## **Appendix V: Disposal of Hazardous Waste Materials**

Environment, Health, and Safety (EHS) is responsible for signing the asbestos hazardous waste manifests (as the generator representative), keeping the generator copy of each manifest, and coordinating the proper disposal of hazardous waste.

EHS reviews the contractor hazardous waste procedures when disposing of asbestos-containing materials before the hazardous waste materials leave the Campus.

# Appendix VI: Annual Asbestos Notification Letter

**CALIFORNIA INSTITUTE OF TECHNOLOGY  
ENVIRONMENT, HEALTH, AND SAFETY SERVICES**

MAIL CODE 25-6 · PHONE (626) 395-6727 · FAX (626) 577-6028 [safety@caltech.edu](mailto:safety@caltech.edu) ·  
<http://www.safety.caltech.edu>

**TO:** Caltech Community  
**FROM:** Environment, Health, & Safety  
**DATE:** November 16, 2015  
**SUBJECT:** Annual Asbestos Notification

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Annual written notice of the presence of asbestos-containing building materials is being provided to all campus Faculty, Staff, and Students as required by California Health and Safety Code §25915.2. Copies of this legislation are available in Environment, Health, and Safety (EH&S).

Prior to 1979 asbestos was used extensively in the building industry throughout the United States for thermal insulation, fireproofing, and in structural support materials. At Caltech, asbestos was used to insulate hot water and steam pipes as well as ventilation ducts. It may be found in some attics, mechanical rooms, and in some floor and ceiling tiles.

The mere presence of asbestos in a building does not necessarily mean that a health hazard exists. Asbestos-containing building materials are not a health threat unless asbestos fibers become airborne and are inhaled.

Exposure to airborne asbestos increases your risk of developing lung disease. Three of the major health effects associated with asbestos exposure are: 1) lung cancer; 2) mesothelioma, a rare form of cancer that is found in the thin lining of the lung, chest and the abdomen and heart; and 3) asbestosis, a serious progressive, long-term, non-cancer disease of the lungs.

In areas where the asbestos is not airborne when bonded or encapsulated, such as floor tiles or painted and properly maintained insulation materials, there is little or no risk to health.

Accordingly, it is important not to disturb asbestos-containing materials. Caltech's policy restricts work on asbestos-containing materials to properly trained and equipped personnel. Moving, drilling, cutting, or otherwise disturbing such materials can pose a health risk and should not be attempted by untrained personnel. Campus Faculty, Staff, and Students should immediately notify EH&S if they observe suspected asbestos-containing materials which are not properly maintained.

The Environment, Health, and Safety Office maintains records of asbestos sampling and air monitoring results performed during the course of asbestos abatement work. These records are available for review by appointment by contacting EH&S at extension 6727.



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CALTECH COMMUNITY SINCE 1947*

## **Appendix VII: Regulatory References**

1. California Health & Safety Code, Section 25915.2, Annual Asbestos Notification.
2. South Coast Air Quality Management District (SCAQMD), Rule 1403, Asbestos Emissions for Demolition/Renovation Activities.
3. Cal/OSHA, Title 8, California Code of Regulations (CCR), General Industry Safety Orders (GISO), Section 5208, Asbestos.
4. Cal/OSHA, Title 8, California Code of Regulations (CCR), Construction Safety Orders (CSO), Section 1529, Asbestos.
5. Cal/OSHA, Title 8, California Code of Regulations (CCR), Section 341.6, Asbestos-Related Work Registration Requirements.
6. Cal/OSHA, Title 8, California Code of Regulations (CCR), Section 5203, Carcinogen Report of Use Requirements.