

**California Institute of Technology**

**ASBESTOS MANAGEMENT  
PROGRAM**



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## INTRODUCTION

The Caltech asbestos management program has been developed to ensure that all work involving asbestos-containing materials (ACM) is controlled to reduce the potential for personnel exposure to airborne asbestos fibers and area contamination. The Caltech Asbestos Management Plan will remain in effect until all sources of asbestos have been identified and removed from all campus facilities. The following sections provide additional information on the process work plans.

## SCOPE

The Caltech Asbestos Management plan applies to all demolition, renovation, and repair activities that might directly or indirectly disturb identified asbestos-containing materials (ACM) on the Caltech campus or affiliated offsites managed directly by Caltech. Projects involving the disruption of ACMs are categorized as “asbestos projects.” Asbestos projects require planning and coordination between EH&S and Facilities operations group(s). The coordination of efforts ensures that ACMs are properly identified and managed before any planned work is likely to disturb them. The Facilities operational groups are identified as follows:

- Planning, Design and Construction (PD&C)
- Facilities Shop
- Facilities Operations
- Faculty Housing

## ROLES AND RESPONSIBILITIES

### Environmental Health and Safety

The role of the EH&S office is to provide oversight for all campus asbestos projects. Under the supervision of the Senior Director of EH&S, the campus Environmental Programs Manager will interact with the various project stakeholders to ensure that the established asbestos process is followed and all project results are documented. In addition to providing campus oversight, the EH&S office is responsible for providing the annual asbestos notification campus-wide, as required by the California Health and Safety Code.

### Asbestos Project Oversight

Several EH&S staff members are trained and certified as Asbestos Building Inspectors (ABIs) by a certified Cal/OSHA-approved training provider. EH&S activities may include:

- Incidental collection of bulk samples of suspected or presumed asbestos-containing materials (PACM). Collected samples are sent for laboratory testing by a laboratory accredited by the National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program (NVLAP) for analysis.

- Compiling asbestos sampling documentation and sample results into a project summary report.
- Maintenance of Caltech's Online Asbestos Archive (BOX.com)
- Provide technical assistance for Facilities operations groups and PD&C with planning and coordinating asbestos-related projects.
- Coordinate with Facilities operational groups to ensure asbestos-related projects are staffed with certified asbestos contractors.
- Responsible for signing off on hazardous waste manifest and filing of hazardous waste manifest.
- Respond to SCAQMD inspections and/or document request related to asbestos projects, when applicable.

#### Asbestos Annual Notification

Caltech annually notifies all employees about asbestos-containing building materials on campus, [Appendix I](#).

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

#### Coordinate Facilities Training

The Caltech EH&S office is responsible for coordinating asbestos Operation and Maintenance (O&M) training for all Facilities stakeholders. As part of this task, EH&S will monitor and maintain training files for all identified Facilities staff members of the Caltech Operations and Maintenance team.

Training coordination includes:

- Selecting a certified asbestos trainer
- Maintenance of training records
- Scheduling of onsite training for all Facilities staff
- Inputting asbestos training certifications into Caltech's MyLearn system.

## **FACILITIES: PLANNING DESIGN AND CONSTRUCTION**

The Planning Design and Construction (PD&C) team is tasked with capital construction and renovation projects across the Caltech main campus and Caltech affiliated sites. These projects may actively or inactively disturb ACM building materials as part of any planned work. Caltech PD&C is responsible for the following:

1. Project coordination with the EH&S office for all projects that may disturb or release ACM from building materials.
2. Contracting a Certified Asbestos Consultant party who can provide a pre-renovation or pre-demolition hazardous materials survey of the project area to identify all potential sources of asbestos that might be disturbed as part of planned projects.
  - a. Ensure that collected samples are sent to a laboratory that is certified under (NVLAP).

3. Contract a certified asbestos contractor who can abate or repair existing asbestos-containing material.
  - a. Ensure that selected asbestos abatement contractor(s) are current with all required asbestos certifications.
4. Coordinate advance notification to regulatory agencies.
  - a. South Coast Air Quality Management District (SCAQMD) - Notification for Demolition and Removal Documents
  - b. California Occupational Safety Health Administration (Cal/OSHA) Asbestos Notification form
5. Implementation of the contractor work plans and safe work requirements such as:
  - a. Area containment
  - b. Warning signs
  - c. General Construction safety requirements
6. Ensure a post-abatement air clearance sampling prior to releasing the workspace.
7. Coordinate between the Caltech EH&S office and selected asbestos abatement contractor the selection of the hazardous waste disposal site and hazardous waste manifest signature.
8. Provide all requested documents to EH&S to ensure the project close-out summary form is completed.

## **FACILITIES: OPERATIONS, HOUSING, AND SHOPS**

Facilities Operations, Faculty Housing, and Facilities Shops have key employees 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. This certification permits certified employees to work safely with asbestos-containing materials while performing small-scale maintenance and repair work. O&M-certified employees must enroll in the [Caltech Respiratory Protection Program](#) and are medically evaluated, trained, and fit-tested to wear respiratory protection annually.

The O&M certification allows Facilities to conduct small-scale repair and maintenance of asbestos-containing building materials to access non-asbestos components. The specific limits of the O&M projects are as follows:

- No Class I level work - direct abatement of friable thermal system insulation or surfacing ACM/PACM
- No Class II level work - abatement of thermal system insulation or surfacing materials containing asbestos
- The O&M project must be less than 100 square feet in total area, or the ACM being removed is no greater than the amount that can be contained in one standard-size glove bag, which shall not exceed 60 inches in length or width

Projects that exceed the O&M thresholds are to be contracted out. Facilities Operations and Shops are responsible for selecting, managing, and overseeing the work of third-party certified asbestos contractors when performing asbestos-related projects. These duties are as follows:

1. Project coordination with the EH&S office for all projects that may disturb or release ACM from building materials.
2. Contracting a Certified Asbestos Consultant party who can provide a pre-renovation or pre-demolition hazardous materials survey of the project area to identify all potential sources of asbestos that might be disturbed as part of planned projects.
  - a. Ensure that collected samples are sent to a laboratory that is certified under (NVLAP).
3. Contract a certified asbestos contractor who can abate or repair existing asbestos-containing material.
  - a. Ensure that selected asbestos abatement contractor(s) are current with all required asbestos certifications.
4. Coordinate advance notification to regulatory agencies.
  - a. South Coast Air Quality Management District (SCAQMD) - Notification for Demolition and Removal Documents
  - b. California Occupational Safety Health Administration (Cal OSHA) Asbestos Notification form
5. Implementation of the contractor work plans and safe work requirements such as:
  - a. Area containment
  - b. Warning signs
  - c. General Construction safety requirements
6. Ensure a post-abatement air clearance sampling prior to releasing the workspace.
7. Coordinate between the Caltech EH&S office and selected asbestos abatement contractor the selection of the hazardous waste disposal site and hazardous waste manifest signature.
8. Provide all requested documents to EH&S to ensure the project close-out summary form is completed.

Facilities staff who may potentially interact or come into contact with ACM or PACM building materials are provided with asbestos general awareness training via Caltech's MyLearn system. General awareness training is provided annually. The [Facilities Training Matrix](#) identifies all Facilities shops required to complete the annual general awareness training.

## **ASBESTOS PROCESS FLOW**

The EH&S office has established an asbestos process flow to ensure proper management ACM. The following procedures are to be implemented whenever there is a possibility that ACMs are to be disturbed during any of the following activities:

- Demolition
- Construction/Renovation

- Utility Installation
- Repair
- Maintenance

The asbestos process flow is categorized into two parts:

1. Project scope check – determines if the planned project area contains ACM. Information about the presence of ACM is confirmed via existing sampling records and new area asbestos sampling if there are no previous sampling records.
2. Asbestos project protocols – If ACM is determined to be present in the planned project area, the project is categorized as an asbestos project. Asbestos projects are required to follow the [asbestos project procedures](#).

### [Part I: Project Scope Check \(Appendix II\)](#)

Procedures:	Available Resource
1. Determine project scope: <ol style="list-style-type: none"> <li>a. Is the building identified as potentially containing asbestos or built pre-1980?</li> <li>b. Will planned work disturb existing building materials?</li> </ol>	<a href="#">Appendix I:</a> List of Caltech buildings built prior to 1980.
2. Are there existing asbestos surveys for the planned work area that can be used to determine the presence of asbestos?	<a href="#">BOX Drive – Campus Asbestos Survey Archive</a>
3. If existing records exist: <ol style="list-style-type: none"> <li>a. Past sampling records confirm no ACM in planned work area. The project can proceed without further testing.</li> <li>b. If the previous sampling record confirms asbestos in the work area and planned work is greater than &gt;100 square feet, then the project is classified as an asbestos project.</li> </ol>	<a href="#">Appendix II - Asbestos Process Flow</a>
4. If there are no existing sampling records for the planned work area, a certified asbestos consultant must be contracted to perform an area survey before the start of work.	
5. New asbestos survey sample results: <ol style="list-style-type: none"> <li>a. Asbestos survey results return as a none-detect – the project can proceed as is</li> <li>b. Asbestos survey results come back positive for ACM. The project is considered an asbestos project. Follow the asbestos project process.</li> </ol>	<a href="#">Appendix: III – Asbestos Project Procedures</a>

[Part II: Asbestos Procedure, projects > 100 square feet of ACM](#)

Procedures:	Notes
1. Select certified asbestos abatement contractor(s) and Consultants. Collect the following documents: <ul style="list-style-type: none"> <li>a) Certified Abatement Company               <ul style="list-style-type: none"> <li>i. Asbestos Supervisor Certification</li> <li>ii. Asbestos Worker Certification</li> </ul> </li> <li>b) Certified Asbestos Consultant               <ul style="list-style-type: none"> <li>i. Certified Asbestos Consultant (CAC) Certification</li> </ul> </li> <li>c) Certified Site Surveillance Technician (CSST)</li> </ul>	An asbestos contractor cannot perform dual roles of asbestos testing/survey and material abatement.
2. Selected contractor to provide project specific-work plan <ul style="list-style-type: none"> <li>a) Area protection – (doors, windows and airlock)</li> <li>b) Asbestos signage around the work area</li> <li>c) Ventilation – HEPA ventilation in and out of worksite</li> <li>d) Project clearance sampling must be conducted by a certified Asbestos Consultant</li> </ul>	EH&S can assist in reviewing site-specific work plans.
3. Area notification – notification will be provided by Caltech’s Service Interruption Notice at least seven days prior to start of work.	
4. Project Monitoring – the project manager monitors and supervises abatement contractors. Abatement contractors are required to adhere to the approved workplan.	EH&S can assist with technical and safety related concerns.
5. Post Abatement clearance sampling is required to release a project workspace.	
6. EH&S will sign off on any hazardous waste manifest	
7. The project manager will collect all information required to complete the Asbestos Project Summary Form.	<a href="#">Appendix VII</a>
8. EH&S will update the BOX cloud drive and include summary documents for each completed project.	<a href="#">BOX Cloud Drive</a>

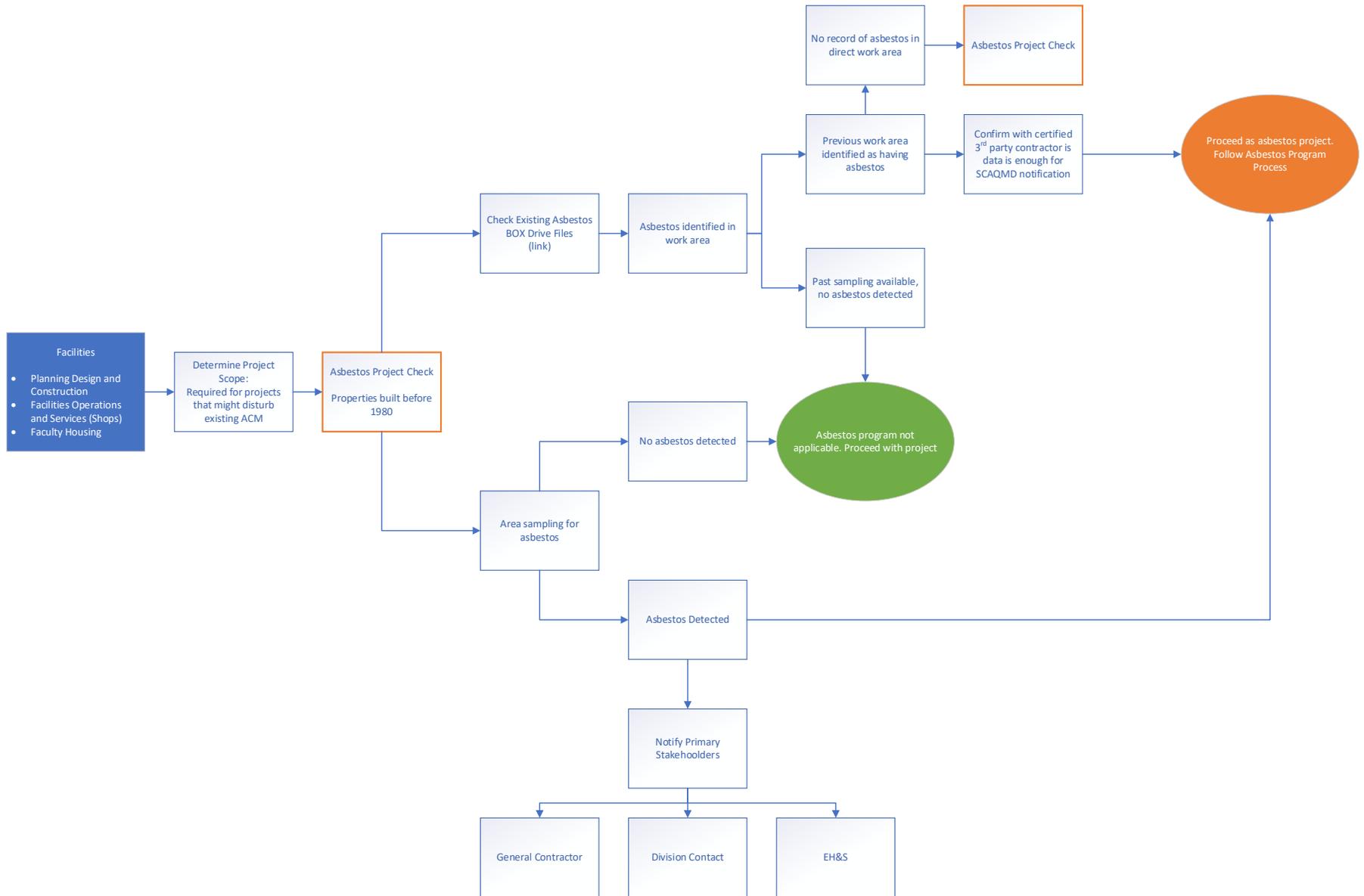
# APPENDIX I: LIST OF CALTECH BUILDINGS BUILT PRIOR TO 1980

Thermal system insulation (TSI) and surfacing materials installed before 1980 must be identified as Presumed Asbestos-Containing Materials (PACM) until bulk testing of suspected materials proves otherwise.

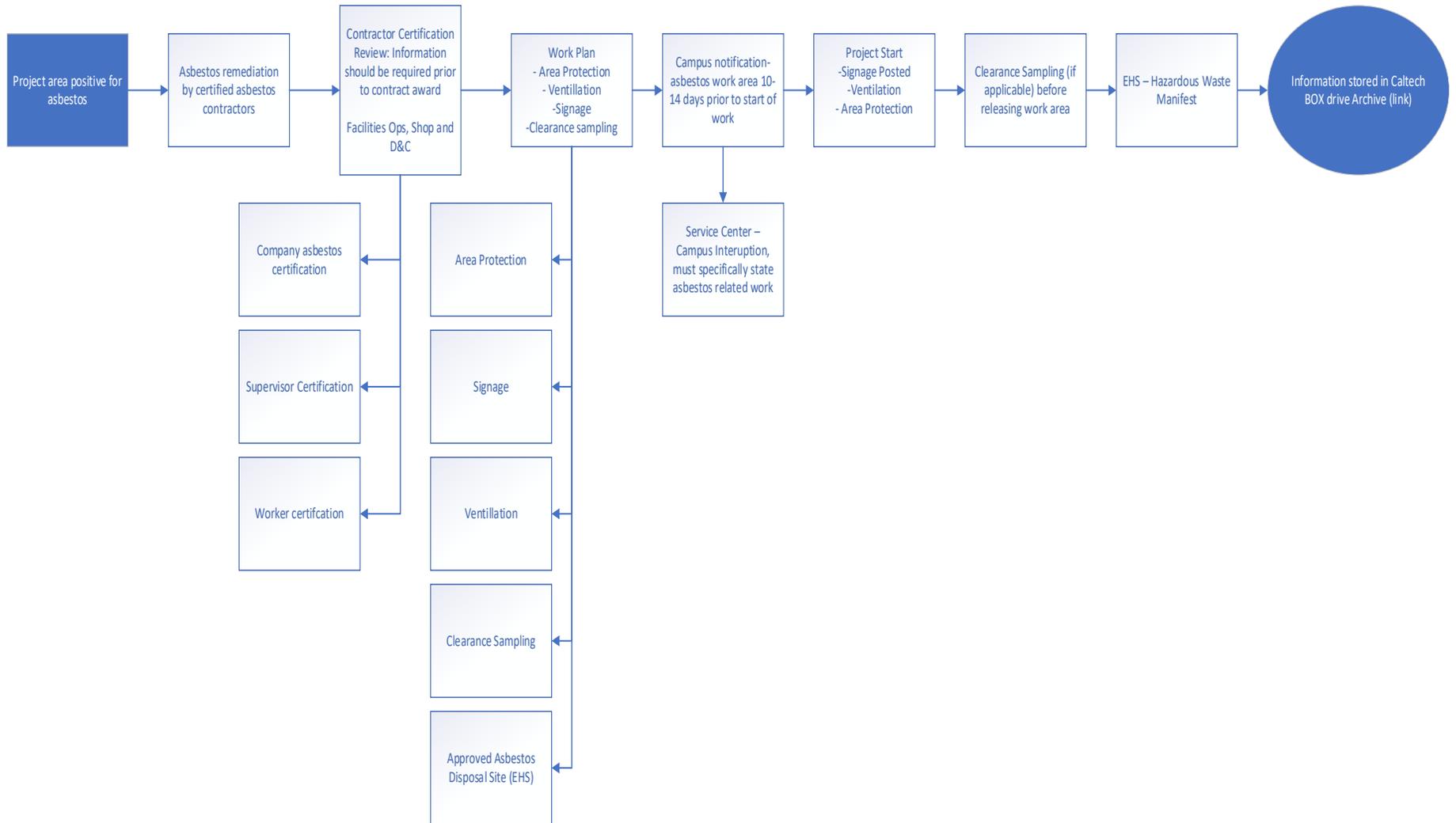
Campus Buildings		Caltech Housing Properties
Alles Laboratory	Keith Spalding	South Wilson Properties:
Alumni House	Kellogg Laboratory	241 South Wilson
Arms Laboratory	Kerckhoff Laboratory	255 South Wilson
Athenaeum	Lauritsen Laboratory	315 South Wilson
Baxter Hall	Lloyd House	373 South Wilson
Beckman Auditorium	Marks House	375 South Wilson
Beckman Behavioral Biology	Caltech Hall	505 South Wilson
Blacker House	Mudd Laboratory, North	515 South Wilson
Braun House	Mudd Laboratory, South	535 South Wilson
Bridge (East, West, Annex)	Noyes Laboratory	551 South Wilson
Brown Gymnasium	Page House	565 South Wilson
Browne Dining Hall	Parsons-Gates	
Center for Student Services	Powell-Booth Laboratory	South Hill Properties:
Central Engineering Services	Public Events Ticket Office	275 South Hill
Central Plant	Public Relations	287 South Hill
Church Laboratory	Ricketts House	295 South Hill
Crellin Laboratory	Robinson Laboratory	305 South Hill
Dabney Hall	Linde Hall	315 South Hill
Dabney House	South Hill Buildings	345 South Hill
Downs Laboratory	South Wilson Buildings	383 South Hill
Facilities Management	Spalding Laboratory	
Firestone Laboratory	Steele Laboratory	Chester:
Fleming House	Synchrotron Laboratory	266 S. Chester
Gates Annex	Thomas Laboratory	
Guggenheim Laboratory	Transportation Center	
Isotope Laboratory	Venerable House	
Jorgensen Laboratory	Young Health Center	

Below is a list of those Caltech buildings built before 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 contain asbestos.

# APPENDIX II – ASBESTOS PROCESS FLOW



# APPENDIX III: ASBESTOS PROJECT PROCEDURES



## APPENDIX IV: 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 is 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 prefabricated 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 other special mechanical applications.

### 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 the 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 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

[List of common asbestos-containing materials \(ACM\)](#)

The following list has been developed as a 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 materials should be considered suspect.

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

## **APPENDIX V: REGISTERED ASBESTOS ABATEMENT CONTRACTORS –**

Registration with Cal/OSHA is required for all contractors who remove 100 square feet or more of the surface area of asbestos-containing building materials with 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 requirement ensures that asbestos abatement contractors have all the required training, licensing, and insurance to conduct asbestos abatement work. Only contractors who meet the regulatory certification and contract insurance requirements for working with asbestos can perform asbestos abatement work for 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 specific Facilities Operations group.

## APPENDIX VI: DISPOSAL OF HAZARDOUS WASTE MATERIALS

The Office of Environmental, Health, and Safety (EH&S) 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.

EH&S reviews the contractor's hazardous waste procedures when disposing of asbestos-containing materials before the hazardous waste materials leave the Campus. Only approved hazardous waste sites are to be utilized by selected 3<sup>rd</sup> party asbestos contractors.

## CALTECH APPROVED HAZARDOUS WASTE DISPOSAL SITES

### ASBESTOS

WASTE MANAGEMENT AZUSA  
1211 W. Gladstone Street  
Azusa, CA 91702  
626-334-0719

WASTE MANAGEMENT – SIMI VALLEY  
2801 Madera Road  
Simi Valley, CA 93065  
(805) 522-9400

WASTE MANAGEMENT – KETTLEMAN HILLS  
35251 Skyline Road  
Kettleman City, CA 93239  
559-386-9711

### COMBINED TSCA AND RCRA WASTE

WASTE MANAGEMENT KETTLEMAN  
35251 Skyline Road  
Kettleman City, CA 93239  
559-386-9711

REVISED: 01/22/2024  
FOR MORE INFORMATION, PLEASE CONTACT THE CALTECH EH&S OFFICE  
[safety@caltech.edu](mailto:safety@caltech.edu) or 626-395-6727

# APPENDIX VII: CALTECH ASBESTOS SUMMARY FORM



## Asbestos Project Summary

Project Name/Description:

Project Manager/Supervisor:

Division/Business Group:

Project Start Date:

Project Completion Date:

The purpose of this document is to describe the project area and identify the outcome of any building materials that were identified as containing asbestos. Please complete the form after all abatement activities have been completed and file in the Campus Asbestos Survey Archive.

1. Building Name and Room(s) sampled
<input type="text"/>

2. Itemize what material(s) were sampled that contain asbestos
<input type="text"/>

3. Itemize building materials that were abated/removed as part of the project
<input type="text"/>

4. Itemize building materials identified as containing asbestos that were not removed
<input type="checkbox"/> : Checkmark if not applicable (all known asbestos-containing materials were removed)
<input type="text"/>

File Path: Box Drive → Campus Asbestos Survey Archive → Building → Floor → (Project Folder)

## APPENDIX VIII: CALTECH ANNUAL NOTIFICATION LETTER

**To: The Caltech Community**

**From: Lauriane Quenee, Senior Director - Environmental Health & Safety**

**Date: November 1, 2023**

**Re: Annual Asbestos Notification**

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

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.

In areas where the asbestos is bonded or encapsulated, such as floor tiles or properly maintained insulation materials, there is little or no risk to health.

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.

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, Postdoctoral Scholars, Staff, and Students should immediately notify EH&S if they observe suspected asbestos-containing materials which are not properly maintained.

The Environmental Health & 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 or writing [safety@caltech.edu](mailto:safety@caltech.edu).

## APPENDIX IX: 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. (Specific work requirements)
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.