

California Institute of Technology

CONTRACTOR SAFETY GUIDE



Caltech Environmental Health & Safety Office
1200 E. California Blvd., M/C B125-6
Pasadena, CA 91125
Phone: 626.395.6727
Email: safety@caltech.edu
Website: safety.caltech.edu

- THIS PAGE INTENTIONALLY BLANK -

Contents

PURPOSE	5
RESPONSIBILITIES	5
STOP WORK AUTHORITY	5
GENERAL CONTRACTORS AND SUB-CONTRACTORS	5
CAMPUS PROJECT MANAGERS	5
CAMPUS BUILDING INSPECTOR	5
ENVIRONMENTAL HEALTH & SAFETY (EH&S)	5
EMERGENCIES AND INJURIES	6
EMERGENCY INFORMATION	6
REPORTING INJURIES	6
GENERAL SAFETY REQUIREMENTS	6
CONSTRUCTION SAFETY REQUIREMENTS	7
<i>(See the Cal/OSHA Pocket Guide for the Construction Industry for detailed information)</i>	7
Confined Space	7
Electrical Safety	7
Excavation/Trench Safety	8
Fall Protection	8
Fire/Life Safety	8
Hot Work	8
Housekeeping	9
Lighting	9
Lockout/Tagout	9
Noise	9
Personal Protective Equipment	9
Scaffolding	9
Trash, Waste, and Scrap Disposal	10
Training Documentation	10
Vehicles	10

ENVIRONMENTAL REQUIREMENTS	10
Hazardous Waste Manifests	10
Construction Generated Regulated Waste	11
Applicable Regulations	11
Hazardous Waste Identification and Management	11
California Specific Hazardous Waste	12
Air Emissions	12
Asbestos Related Projects	12
Environmental Permits, Registration, and Notifications	12
Hazardous Material Spills	12
Lead Related Projects	12
Nano Particulate Work Site	13
Non-Hazardous Waste	13
Project Dust Control	13
Storm Drains/Sanitation Sewers	13
Storm Water Pollution Prevention Plans	13
Caltech Approved Hazardous Waste Disposal Sites	13
Hazardous Waste	13
Asbestos	14
Combined TSCA and RCRA Waste	14

PURPOSE

The California Institute of Technology (Caltech) is committed to complying with all applicable laws and regulations concerning construction, renovation, or maintenance activities on campus. The purpose of the [Contractor Safety Guide](#) is to reduce incidents that may cause personal injury, property damage, and/or liability losses due to construction of Caltech-owned buildings and facilities.

RESPONSIBILITIES

STOP WORK AUTHORITY

- All identified parties below have the authority to stop work when a perceived imminent hazard is detected.

GENERAL CONTRACTORS AND SUB-CONTRACTORS

- Have on-site and implement a site-specific Safety Plan/Code of Safe Practices and written IIPP prior to commencing work.
- Establish the necessary safety precautions needed to perform work without endangering Caltech personnel and/or property.
- Adhere to the contents in the [General Safety Requirements](#) section.
- Adhere to the condition that any contract or sub-contract issued must contain a requirement for all Contractors to utilize the most updated regulatory requirements governing the type of work being performed.

CAMPUS PROJECT MANAGERS

- Prior to finalizing a contract, ensure that contractors have a site-specific Safety Plan/Code of Safe Practices, an Injury and Illness Prevention Program (IIPP), and employee training records.
- Set-up a pre-construction meeting with the General Contractor, EH&S, and Project Manager.
- Save required documentation in the [Construction Safety Manuals](#) folder in box.
- Ensure required documentation listed in the **General Safety Requirements** is available for review.

CAMPUS BUILDING INSPECTOR

- Attend pre-construction meetings where necessary.
- Discuss Caltech's inspection parameters.
- Evaluate plans and specifications to ensure conformance with Caltech Design Guidelines & California Building Code.
- Conduct Quality Control/Quality Assurance inspections on standards of building structures and materials.
- Issue correction notice where structures and materials do not comply with Caltech's Design Guidelines or project documents.
- Attend close-out meetings of construction projects.
- Review specific construction projects that require competent person(s) for high-risk activities.

ENVIRONMENTAL HEALTH & SAFETY (EH&S)

- Meet with the Contractor and Project Manager at the start of each project.
- Present Caltech site-specific safety policies and jobsite requirements.

- Provide the Caltech Project Manager technical assistance and subject matter expertise as needed.
- Assist Campus Building Inspector with on-site audits.
- Conduct periodic review of the Contractor Safety Guide.

EMERGENCIES AND INJURIES

EMERGENCY INFORMATION

Contractors must abide by all alarms and evacuation procedures. Any alarm triggered by the contractor must be reported immediately and a representative must be available to address the incident.

Emergencies: x5000 from campus landlines, or (626) 395-5000 from cell phones.

Non-Emergencies: x4701 from campus landlines, or (626) 395-4701.

Blue Emergency Phones: Press button and talk.

REPORTING INJURIES

Injuries requiring medical attention sustained by employees of a general contractor or its subcontractors, while on the construction site, must be immediately reported to Campus Security (x5000, or (626) 395-5000) and the designated Caltech Project Manager. The process for reporting incidents and injuries are outlined in the following link: <http://safety.caltech.edu/incident-and-injury-reporting>.

GENERAL SAFETY REQUIREMENTS

Contractors are responsible for adhering to the following rules while engaged in construction activities on Caltech property. Violations of Caltech safety rules and/or applicable federal, state, or local (municipal) ordinances may result in a temporary job shut down.

Contractors and their employees must comply with Cal/OSHA regulations outlined in California Code of Regulations, Title 8, Chapter 4: Subchapter 4 ([Construction Safety Orders](#)).

The Information below summarizes the core requirements of Cal/OSHA construction safety orders.

1. General Contractors are required to have the following documents readily accessible. Refer to the [Construction Guide for Employers](#) for further information.
 - a. **Injury and Illness Prevention Program (IIPP)**. Must be located onsite, or at a central office if an onsite office is not available.
 - b. **Cal/OSHA Required Permits and Certifications**. Must be located onsite.
 - c. **Heat Illness Prevention Program**. Must be located onsite, or at a central office if an onsite office is not available.
 - d. **Respiratory Protection Program (if applicable)**. Must be located onsite, or at a central office if an onsite office is not available.
 - e. **Fall Protection Plan (if applicable)**. Must be located onsite.

- f. **Safety Data Sheets (if applicable)**. Must be located onsite, or at a central office if an onsite office is not available. Hard copy or electronic.
- 2. On-Site Hazard Warnings and Postings
 - a. **Cal/OSHA Poster**. Shall be posted at each location where employees report to each day, or at the location from which the employees operate to carry out their activities.
 - b. **Code of Safe Practices**. Shall be posted at a conspicuous location at each job site, or be provided to each supervisory employee who shall have it readily available.
 - c. Emergency Phone Numbers.
 - d. Operating permit for air tanks.
 - e. Operating Rules for industrial trucks (if applicable).
 - f. Authorized access at Controlled Access Zones (if applicable).
 - 3. Hazard Warning Signs
 - a. Where asbestos or lead work are being done.
 - b. At confined spaces.
 - c. At Controlled Access Zones.
 - d. On Air Compressors with Automatic Start.
 - e. High Voltage Warning on Cranes, concrete pumps, high lift trucks.
 - f. On Powder Actuated Tools.
 - g. On Lasers.
 - 4. Written Safety Programs (if applicable, must comply with Caltech-specific programs)
 - a. [Respiratory Protection Program, for work sites where respirators are used](#)
 - b. [Lock-Out Tag-Out \(LOTO\) Program](#)
 - c. [Hot Work Permit](#)
 - d. [Confined Space Program](#)
 - 5. Tailgate Documentation
 - a. Contractor.
 - b. Sub-Contractor.

CONSTRUCTION SAFETY REQUIREMENTS

(See the [Cal/OSHA Pocket Guide for the Construction Industry](#) for detailed information)

Confined Space

The Contractor must notify the Project Manager and submit a copy of their Confined Space Program and training records for review if work in a confined space is planned. Contractor's Confined Space program shall, at a minimum, comply with California Code of Regulations (CCR), Title 8 requirements pertaining to confined space. Contractor is responsible for providing their own monitoring and rescue equipment necessary for safe confined space entry. See Caltech's [Confined Space Program](#) for additional information.

Electrical Safety

Contractors shall consult with their designated Caltech Project Manager before working on or around high-voltage electrical lines. Contractors conducting high-voltage electrical work must be approved for such work by Cal/OSHA.

All work shall, at a minimum, comply with all requirements specified in California Code of Regulations (CCR), Title 8 pertaining to High Voltage, Electrical, and specifically to Subchapter 5-Electrical Safety Orders. See Caltech's [Electrical Safety Program](#) for additional information.

- Electrical extension cords must be in good condition and must not create a trip hazard in hallways or on pedestrian walkways. Cords that stretch across walkways must be entirely covered, secured, elevated, or protected by other means when exposed to damage, water, or where they create tripping hazards.
- Keep all electrical room doors secured when unoccupied.
- Lockout/tagout procedures must be observed when working with electrical equipment. Please refer to lockout/tagout section.
- Machinery or equipment must not be operated within fifteen (15) feet of electric power lines except where the electrical distribution of transmission lines has been de-energized at the point of work.
- All cranes, backhoes, and similar lifting or excavating equipment must be effectively grounded when there is a possibility of such equipment coming into contact with an electric power line or power facility, located overhead or underground.

Excavation/Trench Safety

All excavation and trenching shall be in accordance with all applicable regulations including California Code of Regulations (CCR), Title 8, Trenching and Excavation Requirements. The contractor is responsible for providing a "Competent Person" at every excavation site. This individual must be capable of identifying existing and predictable hazards in the excavation/trench area and determining the suitability of equipment or materials used for support systems, shoring systems, and other protective systems. If excavations/trenches are made entirely in stable rock or are less than 5 feet deep and a competent person has determined there is no potential for a cave-in, a protective system is not needed. A permit from DOSH is required if workers will be entering excavations/trenches 5 feet deep or deeper. Inspection records are subject to review.

Fall Protection

Guardrails, personal fall arrest, personal fall restraint, or positioning systems shall be used when work exposes employees to falls from the perimeter of a structure, sloped roofs steeper than 7:12, within 6 feet from the edge of an unprotected roof, two-point suspension scaffolds or stages are used, scaffolds with incomplete handrails and decking are used, or ladders placed near an opening. If safety harnesses are worn, they must be tied off to independent lifelines. Every employee issued a safety harness shall be instructed by a qualified person in the proper method of wearing, using, and securing it to an approved anchorage point. Tools shall be tied off to their person when working at elevated heights and within six (6) feet from the edge. See Caltech's [Fall Protection Program Guide](#) for additional information.

Fire/Life Safety

Shutting off fire sprinkler valves, smoke or heat detectors, and/or fire alarm systems is forbidden without prior notification and written authorization by responsible Project Manager and Campus Building Inspector.

Hot Work

Caltech has [Hot Work Permit Procedures](#) in place that are to be adhered to, including staging of appropriate fire safety equipment and fire watch/monitor. Any procedures that produce sparks, heat, or flames require a Hot

Work Permit to be issued by the Campus Building Inspector, or alternate Permit Authorizing Individual designated by the General Contractor and reviewed by Caltech Planning, Design, and Construction and Environmental Health and Safety departments prior to start of work. A fire watch must be posted during hot work, and for 1 hour thereafter to locate and extinguish smoldering or flaming ignition. A fire watch must also periodically monitor the area for 3 hours post completion of work. Fire watch personnel require training in emergency procedures and contact numbers before hot work begins.

Housekeeping

The contractor shall keep the work area, specifically walking and working surfaces, clean and free from debris and trash, which could cause slipping and tripping hazards. Tools and materials shall be kept and stored in an orderly fashion. If extension cords must run across a hallway, the extension cord(s) must be covered or taped down.

Lighting

Walkways must remain well-lit for pedestrian safety. When construction activity impacts the lighting of the surrounding area or walkways, the contractor must provide temporary lighting to compensate for the loss. The campus requires a minimum of one (1) foot candle for walkways and parking lots. Building entrances must be maintained at five (5) foot candles.

Lockout/Tagout

A contractor's lockout/tagout program shall, at a minimum, comply with CCR, Title 8 requirements pertaining to lockout/tagout. A contractor must request permission through coordination with the Project Manager prior to performing any lockout/tagout of institute equipment. Prior to any hazardous material abatement jobs, such as asbestos or lead abatement, contractors must notify the Project Manager to coordinate shut down and lockout/tagout of the air handler unit(s) that serve(s) the abatement area. See Caltech's [Lockout/Tagout Program](#) for additional information.

Noise

The City of Pasadena prohibits the operation of construction equipment or construction activity except from 7:00 am to 7:00 pm Monday through Friday, and 8:00 am to 5:00 pm on Saturday, in or within 500 feet of a residential district.

If work is adversely affecting occupants of classrooms, work areas, or the surrounding Pasadena neighborhood, it may be necessary for the contractor to stop work immediately, if advised by the Project Manager. The City of Pasadena Noise Ordinance regulates the effect of a noise source upon neighboring properties.

Personal Protective Equipment

All required personal protective equipment (PPE) will be provided by the contractor. Its use is mandatory, and enforcement is the responsibility of the contractor. PPE includes head, eye, hearing, hand, respiratory, and fall protection equipment. All PPE used must meet ANSI or Cal/OSHA standards.

Scaffolding

All scaffolding shall be erected and maintained in compliance with applicable standards, including CCR Title 8 Article 21, 22, 23 and the manufacturer's requirements. Each scaffold must be erected and dismantled by licensed

scaffolding contractors. Inspection of scaffolding must be made by a **competent person** assigned by the contractor for the work to be performed. All scaffold platforms must be equipped with standard 42-inch-high handrails and mid-rail, rigidly secured and completely decked with safety plank or manufactured scaffold decking. Rigidly secured 4-inch-high toe-boards must be used on all scaffolding or safety netting. Scaffolds must be tied off to the building or structure at proper intervals.

Trash, Waste, and Scrap Disposal

All trash, waste, and scrap must be disposed of each day in proper containers supplied by the contractor. All hazardous waste storage and disposal is to be coordinated through the EH&S office. (See Environmental Requirements)

Take measures to protect areas adjacent to the construction site from dirt, dust, and debris. Debris shall not be allowed to accumulate within or around the work area. The worksite and surrounding area, especially stairways, corridors, and walkways, must be kept clear of obstructions, waste, and dust which may create tripping, slipping, or egress hazards.

Training Documentation

Contractors and subcontractors shall receive safety training as required by Cal/OSHA and Federal OSHA, and fully meet the qualification requirements to complete the assigned work. Contractors must keep current training records for each employee assigned to perform work under this contract. Documentation of required training for all contractor personnel must be made available for examination, if requested. All necessary personal protective equipment will be provided by the contractor, and their employees have been/will be trained in their proper use.

Vehicles

All vehicles must be kept under the control of the Contractor at all times when on Caltech property.

Contractors who furnish their own carts must follow Caltech's Rules of the Road and adhere to access routes identified on the Cart Access Map (located on the final page).

ENVIRONMENTAL REQUIREMENTS

Contractors and sub-contractors are required to comply with Caltech's [Hazardous Waste Management Program](#) for all projects that take place within Caltech property. This section references applicable parts of the Hazardous Waste Management Program that relates to construction projects. This section is to serve as a general guide. Please contact the [EH&S Office](#) for specific project inquiries.

Hazardous Waste Manifests

A Caltech EH&S representative trained in DOT regulations and Hazardous Waste Manifests must review and sign any Hazardous Waste Manifests prior to the removal of any hazardous waste from the job site.

RULES OF THE ROAD

- Speed **LIMIT** 5 mph
- Pedestrians and bicycles have the right of way
- Don't honk unless necessary to avoid an accident
- Do not travel along Olive Walk & San Pasqual Walk between the hours of 11:30 a. m. – 1:30 p.m. Monday - Friday.
- Do not drive on the grass or off paved paths
- Do not travel on the city streets, except in a designated cross walk



PARKING

- Do not block building entrances
- Do not park in locations shown on map:
- Park in designated "cart parking" spaces whenever possible
- Do not leave keys in an unattended parked cart

IN CASE OF ACCIDENT

- Notify your supervisor immediately
- Inspect both the cart and object that was struck for damage
- Notify Security immediately at ext. 5000

Construction Generated Regulated Waste

Applicable Regulations

- Federal Hazardous Waste - Title 40 –Subpart 261 (Identification and Listing of Hazardous Waste)
 - [Electronic Code of Federal Regulations \(eCFR\)](#).
- Federal RCRA laws requiring generators of hazardous waste comply with EPA requirements under
 - [Title 40 of the Code of Federal Regulations, Part 262](#).
- [Toxic Substances Control Act](#) (TSCA). Federal law also enacted a special set of laws regarding substances that had long term effects on both human and environmental health. TSCA requires that we properly identify sources of:
 - Poly Chlorinated Biphenyls (PCBs)
 - Asbestos
 - Lead
 - Radon
- The State of California has enacted additional laws that further regulate hazardous wastes beyond the Federal requirements.
 - California Hazardous Waste
 - [Title 22, Division 4.5](#) – Environmental Health Standards for the Management of Hazardous Waste
 - California Universal Waste Rule (E-waste)
 - [Title 22, Division 4.5, Chapter 23, and § 66273.1](#)

Hazardous Waste Identification and Management

Waste generated during the various phases of construction must be identified and disposed of through the appropriate channels as described by the [Resource Conservation and Recovery Act](#) (RCRA). RCRA regulations were developed by the Environmental Protection Agency (EPA) to function as a standard framework for the management of hazardous and non-hazardous solid waste.

Construction related waste is determined to be hazardous if it is specifically listed as a known hazardous waste by the Environmental Protection Agency (EPA), as described in [40 CFR 261](#). Waste material(s) that are not specifically listed by the EPA may still be considered hazardous waste if it exhibits specific characteristics such as: Ignitability, Corrosivity, Reactivity, and Toxicity. Follow the provided link for a more detailed explanation of specific waste characteristics [40 CFR 261.20](#).

Contractors are required to use only [Caltech Approved Hazardous Waste Disposal Sites](#).

In addition to the RCRA, Federal law also enacted a special set of laws regarding substances that had long term effects on both human and environmental health. These laws are described under the [Toxic Substances Control Act](#) (TSCA). TSCA is applicable to construction related projects due to the type of waste material that might be removed as part of renovations or demolitions:

- Poly Chlorinated Biphenyls (PCBs) – Common in older light fixture ballasts and electrical transformers.
- Asbestos – Found in construction building material and insulation prior to the EPA phase out in 1989.
- Lead – Commonly found in older paint, ceramics, and pipe/pipe welding materials.

- **NOTE:** Any contract or sub-contract issued must contain a requirement for all contractors to utilize the most updated regulatory requirements, as these regulations do change based on the latest EPA assessments.

California Specific Hazardous Waste

The State of California has enacted additional laws that further regulate hazardous waste beyond the Federal requirements [CCR Division 4.5](#). Wastes such as used motor oil or those materials which cause widespread aquatic environmental damage are treated as hazardous waste for State purposes.

Disposal of Electronic waste (E-waste) is also regulated in the State of California, [22 CCR 66273.1](#). E-waste is often generated as part of renovation projects. E-waste should not be disposed as general waste and instead directed to specialized vendors who can manage the waste with accordance to state regulations. Commonly generated construction E-waste includes light fixtures, light bulbs, ballasts, and associated switches.

Air Emissions

Any operation or procedure involving the release of significant quantities of dust, vapors, fumes, or mist shall be approved by EH&S prior to start of work. Examples are large applications of floor, wall, or roof coatings, spray applications, cement cutting, sandblasting, excavations, and grading activities, etc. Contractors must ensure that Zero VOC and No Odor Paints are used on any campus projects.

Asbestos Related Projects

The EH&S Office can assist Project Managers in determining whether asbestos-containing materials (ACMs) are present before the removal of any building or insulation materials. See Caltech's [Asbestos Management Program](#) for additional information.

- A Certified Asbestos Consultant (CAC) must be appointed for projects relating to Class I or Class II abatement projects [Title 8 Section 1529](#).
- Provide sample analytics report to the EH&S Office to ensure proper management of any possible ACM related to D&C projects.
- Notify and provide the EH&S Office with documentation relating to the submission filing of SCAQMD [Rule 1403 Procedure 5 plans](#).

Environmental Permits, Registration, and Notifications

The contractor will obtain necessary permits or registration from applicable environmental agencies (e.g. South Coast Air Quality Management District, California Air Resources Board, Cal/OSHA, etc.) **PRIOR** to beginning any work that will require such a permit. Copies of all permits/registrations will be included in the work plan and submitted to the Project Manager **in advance** of such work.

Hazardous Material Spills

The contractor must report any spills immediately to the Project Manager and EH&S and take immediate action to contain the spill. Regulatory agencies require containment and remediation of all spills of hazardous materials, including fuel and oil. Contractors who spill any such substances on institute property are responsible for clean-up. Clean-up of the contaminated area must be performed to the regulatory accepted level based on testing.

Lead Related Projects

The EH&S Office can assist Project Managers in determining whether lead is present before its removal. See Caltech's [Lead Management Program](#) for additional information.

- A lead inspector/assessor certified by the California Department of Public Health (CDPH) must be used to perform lead inspections, collect samples, and interpret laboratory analytical results.
- Only CDPH-certified lead supervisors and workers may be used for removal of any lead-containing materials (LCMs).

Nano Particulate Work Site

The EH&S Office can assist Project Managers in determining whether Nano particles are present before the start of construction related work.

- Laboratory spaces that actively used carbon Nano particulates are to be assessed prior to start of work.

Non-Hazardous Waste

Disposal of non-hazardous construction debris must comply with the City of Pasadena Municipal Code, Chapter 8.62, Ordinance No. 6917 "[Construction & Recycling Ordinance](#)".

Project Dust Control

A [Dust Control Plan](#) shall be provided to the Project Manager prior to work start and adhered to by the contractor. Additionally, contractors must submit a Dust Control Plan to the South Coast Air Quality Management District (SCAQMD) for large-scale operations prior to work start. "Large scale" is defined as earth moving throughput volume of 5,000 cubic yards or more of material three (3) or more times during a 365-day time period.

Storm Drains/Sanitation Sewers

No hazardous, toxic liquid, or solid material(s) shall be discharged to the storm drain and/or sanitary sewer system. Contractors performing planned work that will create potential runoffs from water blasting, wet method surface removal, etc., must consult with the Project Manager to ensure proper protection of the drainage system and adequate product collection procedures.

Storm Water Pollution Prevention Plans

A [Storm Water Pollution Prevention Plan](#) shall be provided to the Project Manager prior to work start and adhered to by the contractor. If more than one acre of land is disturbed, the contractor must submit a Storm Water Pollution Prevention Plan to the California State Water Resources Control Board (SWRCB).

Caltech Approved Hazardous Waste Disposal Sites

Hazardous Waste

- Clean Harbors
 - Buttonwillow Facility
 - 2500 Lokern Road, McKittrick, CA 93251
 - 661-762-6200
 - Wilmington Facility
 - 1737 Denni Street, Wilmington, CA 90744
 - 310-835-9998
- Veolia Environmental Services
 - 107 S. Motor Avenue, Azusa, CA 91702
 - 626-334-5117

- Crosby & Overton
 - 1610 W. 17TH Street, Long Beach, CA 90813
 - 562-432-5445
- Stericycle Inglewood
 - 425 Isis Avenue, Inglewood, CA 90301
 - 323-776-6233

Asbestos

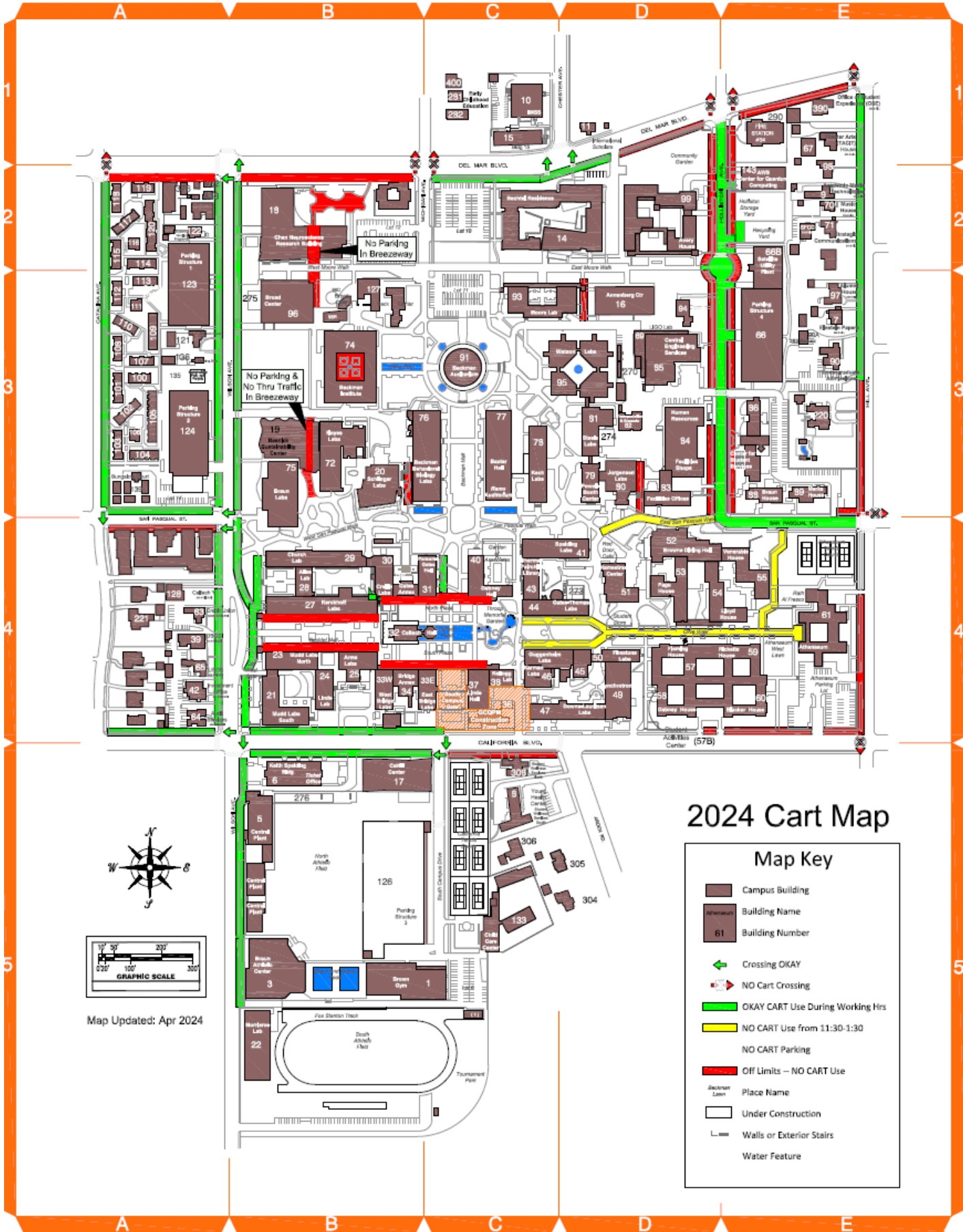
- Waste Management Azusa
 - 1211 W. Gladstone Street, Azusa, CA 91702
 - 626-334-0719
- Waste Management
 - 2801 Madera Road, Simi Valley, CA 93065
 - 805-522-9400
- Waste Management
 - 35251 Skyline Road, Kettleman City, CA 93239
 - 559-386-9711

Combined TSCA and RCRA Waste

- Waste Management Kettleman
 - 35251 Skyline Road, Kettleman City, CA 93239
 - 559-386-9711

FOR MORE INFORMATION, PLEASE CONTACT THE CALTECH EH&S OFFICE

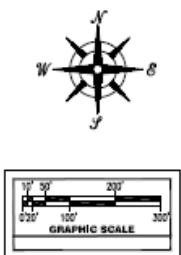
safety@caltech.edu or 626-395-6727



2024 Cart Map

Map Key

- Campus Building
- Building Name
- Building Number
- Crossing OKAY
- NO Cart Crossing
- OKAY CART Use During Working Hrs
- NO CART Use from 11:30-1:30
- NO CART Parking
- Off Limits – NO CART Use
- Place Name
- Under Construction
- Walls or Exterior Stairs
- Water Feature



Map Updated: Apr 2024