1. CONSTRUCTION SAFETY GUIDE

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1. POLICY
It is the policy of the California Institute of Technology (Caltech) to comply fully with all applicable laws and regulations concerning construction activities on campus.

All construction companies doing work on Caltech property must have written Safety Plans that are adequate to protect the safety of people and property within the construction site and the surrounding area.

2. PURPOSE
The purpose of the Caltech Construction Safety Guide is to reduce incidents that cause personal injury, property damage, and liability losses due to construction, renovation, and demolition of Caltech-owned buildings and facilities.

3. RESPONSIBILITIES

CAMPUS SECURITY
- Serve as the first responder for all medical and non-medical emergencies on construction sites.
- Provide initial medical attention involving first aid and triage for incidents involving injuries and contacts the Pasadena Fire Department Paramedic team if necessary.
- Assist with traffic and crowd control, re-routing, and establishing barricades, if and when necessary.

ENVIRONMENT, HEALTH, AND SAFETY (EHS)
- Provide the Caltech Project Manager with information pertinent to the job site including but not restricted to:
  1. Information on asbestos/lead/mercury contamination history.
  2. Assistance with potential hazardous and universal waste disposal.
  3. Specific guidelines on necessary safety parameters, such as Hot Work Permit, confined space requirements, storm water issues, etc.
  4. Consultation and assistance with HVAC, fume hood, biosafety safety cabinets, eyewash/shower stations, and fire protection systems.
- Meet with the contractor’s safety representative to:
  1. Provide Caltech with site specific safety policies and requirements. See Appendix A.
  3. Review Storm Water Pollution Prevention Plan, if applicable.
- Partner with the Caltech Project Manager in performing periodic job site audits for compliance with OSHA, EPA, and Fire Safety regulations.
- Assist with FM Global inspections and project requirements.
- Serve as Safety Liaison between the contractor and the campus community.
PROJECT MANAGERS

- Ensure that contractors consider Health and Safety as a priority in planning day-to-day operations.
- Provide construction safety project oversight.
- Implement Campus Construction Safety Policies.
- Ensure that contractors have at a minimum an IIPP and a Code of Safe Practices.

CONTRACTORS

General and Sub-contractors:

- Establish the necessary safety precautions needed to perform work without endangering Caltech personnel and/or property.
- Have and implement a written IIPP and Code of Safe Practices for each site/job including but not limited to the items detailed below.

SITE SPECIFIC CAL/OSHA CODE OF SAFE PRACTICE

All contractors are required to submit a written Code of Safe Practices to the Caltech Project Manager prior to commencement of any project. The Contractor must address safety issues within the construction site, such as construction materials, chemicals, fire hazards, and construction procedures, as well as the impact of the construction on the surrounding area, including traffic flow, parking, street closures, utility turn-offs, pedestrian crossings, safety signs, etc. Contractors are responsible for the disposal of trash and hazardous materials.

Upon request the Contractor shall provide:

1. The identity of any safety consultants or the contractor’s safety officer and on-site manager/safety officer.
2. The safety inspections schedule.
3. Type and frequency of training conducted for contractor’s personnel including tailgate meetings, lifting training, emergency procedures, etc.
4. Information on the types of heavy equipment and the necessary precautions for such equipment.
5. The Hazard Communication Program.
6. The Injury and Illness Prevention Program.
8. The Heat Illness Prevention Program.
9. The Hot Work Permit Program which includes the location of any possible fire hazards and the fire-fighting equipment available to contain an on-site fire.
10. A detailed description of hazardous or unusual procedures necessary for a particular site/job.
11. The Impact of the construction on the surrounding area including traffic flow, parking, street closures, utility turn-offs, pedestrian crossings, etc.
12. Placement, quantity, and type of safety warning lights, signs, or barricades required during construction.
13. If applicable, the Storm Water Pollution Prevention Plan.
14. If applicable, an Excavation and Dust Control Plan.
15. Written procedures addressing injuries, fire, or other emergency concerns on the job/site.

4. SAFETY GUIDELINES FOR CONTRACTORS

Contractors will assume complete responsibility for the safe performance of all work on California Institute of Technology property. This responsibility extends to contractor employees, sub-contractor employees, and any person connected with a contracted project on Caltech property.

1. A site specific Code of Safe Practices Plan must be submitted to the Caltech Project Manager. All work, materials and equipment must conform to Cal/OSHA Standards and adhere to all applicable, federal, state, and municipal laws.

2. Contractors are responsible for establishing the necessary safety precautions needed to permit performance of work under operating conditions without endangering Caltech personnel and/or property.

3. The Contractor is expected to be familiar with all Cal/OSHA rules, regulations and general duty obligations applicable to its work. Contractor must direct and require its employees to comply with these rules. Contractor also has the responsibility to correct any unsafe conditions and hazards on the job site.

4. The contractor must report serious injuries and accidents on the job site to the Caltech Project Manager and to Caltech Security.

5. The Contractor’s on-site supervisor should notify the Caltech Project Manager or the Campus Fire Marshal when questions arise regarding safety related conditions at the Caltech Construction site. The Project Manager or Campus Fire Marshal will coordinate with EHS, whenever necessary, to find a satisfactory resolution to the safety issue in question.

6. Violations of Caltech safety rules and/or applicable federal, state, or municipal ordinances may result in a temporary job shut down.

7. Contractors must use proper lock-out/tag-out procedures at all times as required.

8. Welding, cutting, brazing, and/or any procedures that produce sparks and heat require a Caltech Hot Work Permit issued by the campus Fire Marshall / Construction Inspector.

9. Construction of temporary buildings and trailers must meet all code requirements and be approved by the Project Manager.

EMERGENCIES AND INJURIES

Emergencies and injuries requiring medical attention that occur on a construction site must be promptly reported to Campus Security at x5000.

GENERAL WORK REQUIREMENTS

Contractors are responsible for the following rules while engaged in activities on Institute property:

1. Any crane use and rigging must be done by qualified personnel.
2. Contractors shall consult with the Project Manager before working on or around high voltage electrical lines or substations.
3. All vehicles must be kept under control at all times when on Institute property.
4. No "visiting" or "sight-seeing" is permitted inside of the Contractor's work area without proper authorization.
5. Contracted employees shall not operate any Institute equipment or tools unless the employee has been authorized to do so by the Institute.
6. Contractors will be responsible for following proper Institute procedures in the event of an injury, fire, or other emergency on the job.

**HOUSEKEEPING**

1. All job sites must be kept clean and orderly at all times.
2. Materials and equipment must be stored in such a manner so as not to collapse, cause excessive pressure on, or damage buildings or pipe lines.
3. Materials and equipment must not block or hinder access to valves, pipes, manholes, vaults, fire hydrants, fire extinguishers, fire alarm panels, AED’s, smoke detectors, sprinklers, warning signs, fire lanes, electrical equipment, and streets, parking stalls, building entrances or exits.
4. It is the Contractor's responsibility to properly dispose of all scrap and rubbish in a timely manner.
5. Contractors must not use fire hydrants or building fire hoses for purposes other than emergencies.
6. Hot work must be performed by authorized personnel and in adherence with the Institute’s Hot Work Permit Guidelines.
7. Shutting down sprinkler valves, smoke or heat detectors, and/or fire alarm systems is forbidden without prior notification and written authorization.

**OVERHEAD WORK, SCAFFOLDS, AND BARRICADES**

1. Contractors are responsible for barricading below work areas and posting a "look-out" in order to protect employees/pedestrians from falling debris.
2. All scaffolds and work platforms must be constructed to Cal/OSHA standards and maintained free of defects. Guard rails shall be installed on all scaffolds and work platforms over 7 ½ feet above ground. Supporting level decking must be at least two planks wide and tested before use. Toe boards are required on all railed sides of work surfaces where employees work or pass below.
3. Barricades or guard rails meeting Cal/OSHA standards must be provided around all openings, excavations, pits, open sewers, or any other openings in floors. The barricades or guard rails must be kept in place at all times and adequately lighted at night.
4. Contractors are to furnish all required safety warning lights and signs.
5. All ladders must meet Cal/OSHA standards.
6. Contracted employees or Institute personnel shall not be permitted under loads handled by hoists, cranes, or power shovels.
EXCAVATION

Before contractors start any excavation or trench work they must obtain the necessary permits as well as review and comply with all CAL/OSHA standards. Excavating or trenching must be done in a manner which will not expose employees to possible injury. Shoring must be installed in a manner so that it meets all applicable codes and standards.

The following general rules and procedures must be followed during excavation:

1. Prior to creating any opening, the contractor must consult with the Project Manager to ascertain if any sewer lines, steam lines, power lines, or other obstacles may be encountered during excavation.
2. Excavation greater than five (5) feet deep, in which employees are required to work, will be guarded by proper shoring or sloping in accordance with CAL/OSHA permit requirements and construction safety standards.
3. Materials should be stored at least two (2) feet away from the edge of the excavation.
4. Barriers should be used along the side of excavation sites where mobile equipment is used or allowed adjacent to the opening.
5. Pits, shafts, and trenches will be either covered or properly barricaded and illuminated.
6. Excavation cross-overs, such as walkways, bridges and ramps must have guardrails and appropriate signage.
7. Daily inspections of excavations shall be made by a competent person. If evidence of a possible cave-in or slide is apparent, all work in the excavation shall cease until necessary precautions have been taken to safeguard the employees.
8. A Dust Control Plan shall be provided to the Project Manager and followed by the contractor. Contactors must submit a Dust Control Plan to the South Coast Air Quality Management District for large scale operations. Large scale is defined as earth moving throughput volume of 5,000 cubic yards or more within 3 times during a 365 day period.
9. A Storm Water Prevention Plan shall be provided to the Project Manager and implemented by the contractor. If more than one acre of land is disturbed, the contractor must submit a Storm Water Prevention Plan to the California State Water Resource Board.

HOT WORK PROCEDURES

Hot Work permits shall be obtained from the Campus Fire Marshall / Construction Inspector or an alternate designated by the Design and Construction Department Senior Director. The permit is required before the commencement of any operation involving cutting, welding, brazing and/or any procedure that produce sparks and heat.

The applicable procedures on the permit, in addition to any governmental regulations currently in effect, shall be followed:

1. Clear the area of any combustible materials.
2. Have a fire extinguisher standing by.
3. Inspect the area after the hot work has been completed for fire.
4. Re-inspect the area at least one hour after the hot work has been completed for any signs of fire or the potential for fire.

Upon completion of the Hot Work final inspection, the responsible party returns a signed Hot Work Permit to the Construction Inspector.

DEMOLITION
1. The contractor must implement dust and noise control measures during any demolition process.
2. If an entire structure/building is to be demolished, the contractor must notify the South Coast Air Quality Management District (SCAQMD).
3. If asbestos-containing material (ACM) is present and a load supporting structural member is to be removed, the contractor must notify the South Coast Air Quality Management District (SCAQMD).

ASBESTOS REMOVAL
1. Project Managers should determine if asbestos-containing materials are present before removing any building or insulation materials. EHS will assist the Project Managers in this effort.
   a. A Certified Asbestos Consultant (CAC) must be used when a General Contractor is hired for a project.
   b. If a Caltech Project Manager acts as a General Contractor then the EHS Office can supply a Certified Asbestos Building Inspector to work with the Project Manager to determine asbestos-containing materials.
2. Project Managers must use only CAL/OSHA certified asbestos contractors for asbestos removal.
3. The contractor must notify CAL/OSHA and the South Coast Air Quality Management District for projects requiring more than 100 square feet of asbestos removal.

LEAD BASE PAINT REMOVAL
Before removing painted materials that may contain lead, Project Managers must determine the lead content of the materials.

Only CAL/OSHA certified lead contractors must be used for removal of any lead containing materials.

HAZARDOUS WASTE MANIFESTS
1. A Caltech EHS representative must review and sign any Haz Waste manifests prior to removal of any manifested materials from the job site.
APPENDIX A: JOBSITE REQUIREMENTS CHECKLIST

☐ ___ 1. CAL/OSHA POSTER
   a) CAL/OSHA poster
   b) Emergency Phone Numbers
   c) Hazard Warning signs
   d) Operating Rules for Forklifts

☐ ___ 2. Written Safety Programs
   a) IIPP (Injury and Illness Prevention Program)
   b) Code of Safe Practices
   c) All CAL/OSHA required permits
   d) All CAL/OSHA required certifications
   e) Respiratory Protection Program for all work sites where respiratory protection is needed
   f) Fall Protection Plan, if needed
   g) Tailgate Meeting Documentation
   h) Safety Data Sheets (SDS) and Inventory List
   i) Heat Illness Prevention Program
   j) Lock-Out Tag Out
   k) Hot Work

☐ ___ 3. First Aid Kit and Personnel Trained in CPR/First Aid

☐ ___ 4. Drinking Water, Disposable Cups, and Trash Receptacle

☐ ___ 5. Hand Washing Facilities

☐ ___ 6. Personal Protective Equipment
   a) Hard hats
   b) Safety glasses
   c) Ear plugs and/or muffs
   d) Fall protection (as needed)
   e) Steel toe and metatarsal caps (as needed)
   f) Respirators (as needed)

☐ ___ 7 Fire Extinguishers
   a) Office trailer
   b) Storage trailer
   c) Work area
   d) Cab of crane (if crane is on site)
   e) Flammables and Combustibles

☐ ___ 8. Operator’s Manuals for Equipment

☐ ___ 9. CAL/OSHA Permits
   a) Trenching - Annual Permit
   b) Trench - Notification Form
c) Cranes over 3 ton capacity
d) High Work (over 36 feet in height)

☐ ___ 10. Toilet Facilities
   a) One per 20 workers
   b) If females on site - separate facility

☐ ___ 11. Stairways
   a) For buildings of 3 stories or less, at least one stairway
   b) For buildings of more than 3 stories, 2 or more stairways

Signature: ________________________________
Date: ________________