Construction Subcontractor Safety Handbook

V2.0

Prepared by: Facilities and Environmental Health & Safety Divisions

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Construction Safety Handbook v2.0

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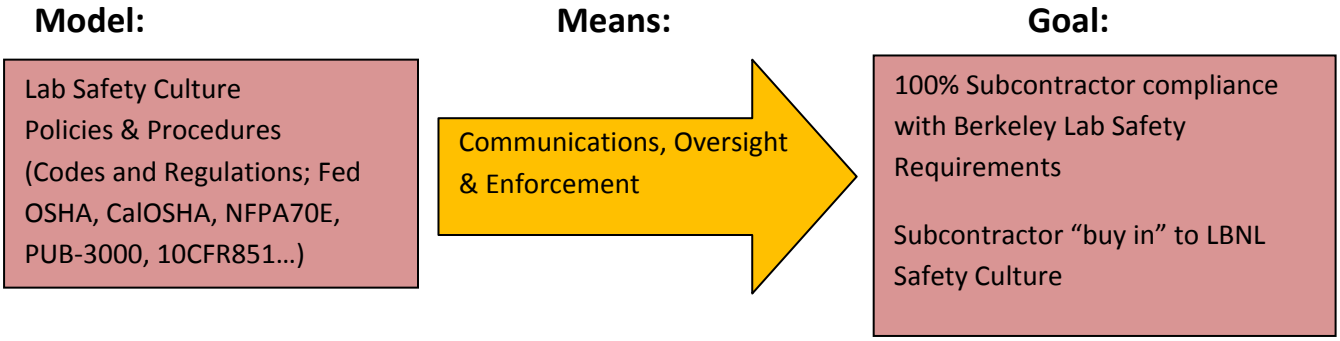
1.0 Introduction:

Welcome to the Lawrence Berkeley National Laboratory (LBNL) and thank you for participating in the LBNL mission "To Enable World-class Science." Every construction and maintenance project that our subcontractors perform here at LBNL supports the valuable scientific research conducted here. The LBNL Environmental Health & Safety (EH&S) and Facilities Divisions support this mission through our quality standards: Safety, Customer Satisfaction, Teamwork and Efficiency. As noted, Safety is our highest priority.

The objective of this Safety Handbook is to communicate to our construction subcontractors exactly what LBNL's expectations are regarding the safe and efficient performance of work here at the Lab. The EH&S Safety Professionals and the Facilities Project Team are your partners in the construction of any project here at LBNL. Open communication is essential to that partnership. We want you to understand our expectations with regards to safety so that we all can succeed in "working safely."

This revised Safety Handbook will focus on communicating LBNL safety policies, procedures and expectations. This handbook will also provide a set of tools (such as the Plan of the Day meeting, safety briefings) which are intended to improve safety communications.

As illustrated in the diagram below; the "Model" is LBNL's safety culture which is based on the State and Federal Safety Codes and Regulations; the "Goal" is performing work at all times with 100% compliance to the safety policies and procedures, and the "Means" is open communication between LBNL and you (the construction subcontractor) and your workforce. We believe this goal is achievable if we (LBNL and our subcontractors) are committed to working together and sharing LBNL's safety culture.



2.0 Safety and Health Requirements and Expectations:

Construction Subcontractors provide a variety of construction services to LBNL, including building construction and maintenance activities; utilities and infrastructure construction; grounds maintenance; training and consultation; and installation, testing, calibration, repair, and maintenance of equipment and instruments. All of these work activities must be performed safely and in accordance with the applicable safety codes, standards and regulations.

Because LBNL operates under contract with the Department of Energy (DOE), LBNL requires all construction subcontractors to comply with the DOE Worker Safety and Health Program (10 CFR 851). As partners in all of the construction projects here at LBNL we need to work together to verify that these safety requirements are being met.

LBNL also uses our own safety manual (PUB-3000), and the Cal/OSHA Construction Safety Orders to control construction work safety unless the Federal regulations are more strict. The Cal/OSHA Injury & Illness Prevention Plan (IIPP) required by the Construction Safety Orders is built on the same idea as LBNL's Integrated Safety Management System program (ISMS).

LBNL Safety Culture:

Q: What's so different about working for the LBNL?

Answer: LBNL's Safety Culture, which focuses on:

- Attitude; Safety is part of the work not an "add on"
- Every worker is to leave work at the end of the day in the same shape as when they arrived.
- LBNL's Integrated Safety Management System (ISMS) is followed and the 5 Principles of ISMS are taught, monitored, followed up and evaluated. ISMS is covered in Section 4.0.
- Enforcement of PUB 3000; 10 CFR 851, DOE Worker Safety & Health Program; Federal OSHA Rules (29CFR1910)
- Making NFPA 70E, "Standards for Electrical Safety in the Workplace" a requirement.
- Use of Job Hazard Analysis (JHA) for work planning and control
- Communication through the Plan of the Day Safety Meeting.
- Craft Worker Safety Orientation Training.
- Lock Out/Tag Out (LOTO) Processes and the LOTO Permit process.
- General Employee Radiation Training (GERT), and Radiation Work Permits (RWP).
- Fall Protection 100% of the time when working above 6 ft.
- Hard hats and Safety Glasses 100% of the time on construction sites.
- Safety Glasses 100% of the time on construction sites.
- Dig Permits/Penetration Permits process.
- Crane Critical Lift Plans
- Work planning and controls for asbestos, lead, silica and other hazardous materials
- Reporting of injury 100% of the time
- Every worker has "Stop Work" authority

3.0 Policies and Procedures

Facilities and EH&S Safety Policy:

It is the policy of LBNL to perform all work safely with full regard to the well being of workers, guests, the public, and the environment.

Keys to implementing this policy are the following core safety values:

- The institution demonstrates a strong commitment to safety by integrating safety into all facets of our work.
- Managers and supervisors are actively involved and demonstrate leadership in performing work safely.
- Individuals take ownership for safety and continuously strive to improve.
- Individuals demonstrate an awareness and concern for the safety of others.

LBNL expects our subcontractors to comply with the DOE's Worker Safety and Health Program, regulation 10 CFR 851, which enforces worker safety and health requirements including, standards of the Occupational Safety and Health Administration (OSHA) as incorporated in the LBNL Worker Safety and Health Program. Violations of safety and health provisions may subject subcontractor to dismissal and/or penalties. The subcontractor shall follow the provisions of its Cal/OSHA mandated Injury and Illness Prevention Plan (IIPP) and submit it to LBNL when requested. The subcontractor shall also follow all LBNL safety procedures and policies provided.

Below is a list of the most frequently used codes, regulations and publications which specify LBNL safety requirements, included is a brief overview of these requirements.

Reference Subcontractor Requirements and Governing Safety Publications

3.1 Subcontract, General Conditions, Section 013529 – Environment, Safety, and Health Procedures. This section of your Subcontract specifies safety requirements for your work.

3.2 PUB 3000 LBNL Health and Safety Manual
This is the LBNL safety manual, listed below are the chapters which are most relevant to construction projects.

Chapter 4 – Industrial Hygiene
Chapter 5 – Occupational Safety
Chapter 6 – Safe Work Authorization
Chapter 8 – Electrical Safety
Chapter 10 – Construction Safety Manual, Administrative Policies,
Chapter 10, Appendix A, Code of Safe Practices
Chapter 10, Appendix B, Environmental Policies
Chapter 11 – Environmental Protection
Chapter 12 – Fire Prevention and Protection
Chapter 13 – Gases
Chapter 18 – Lock out/Tag Out Safety

Chapter 19 – Personal protective Equipment (PPE)
Chapter 20 – Waste Management
Chapter 21 – Radiation Safety
Chapter 27 – Crane, Hoisting and Rigging
Chapter 28 – Forklifts and Other Powered Industrial Trucks
Chapter 30 – Fall Protection Program
Chapter 32 – Job Hazard Analysis
Chapter 33 – Welding, Joining and Thermal Cutting
Chapter 34 – Confined Spaces

3.3 10 CFR 851: Construction subcontractors shall comply with the Department of Energy's Worker Safety and Health Program regulation, 10 CFR 851, which enforces worker safety and health requirements including the standards of the Occupational Safety and Health Administration (OSHA) as incorporated in the LBNL Worker Safety and Health Program. Additional information on 10 CFR 851 is included in Appendix G.

3.4 NFPA 70E; Standard for Electrical Safety in the Workplace, 2009 Edition; specifically Article 120 "establishing an Electrically Safe Work Condition" (principles of LOTO) and NFPA 70E Annex G, which provides a sample LOTO procedure.

3.5 Fed/OSHA and Cal/OSHA; Federal and State Laws governing worker safety, To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes.

3.6 Other References; EH&S has prepared a "Quick Reference Guide to LBNL Construction Safety Requirements" which is included as Appendix I. EH&S also maintains a safety website, you can access LBNL safety information at http://www.lbl.gov/ehs

4.0 Integrated Safety Management System

LBNL and the DOE are committed to having all work performed safely and in a manner that strives for the highest degree of protection for employees, participating guests, visitors, sub-contractors, the public, and the environment. In addition, LBNL seeks continuous improvement and sustained excellence in the quality of all safety (environment, health and safety) efforts. To achieve these goals, LBNL has adopted the seven principles and five functional practices of the Integrated Safety Management System (ISMS). They are:

1) Line Management Responsibility for Safety
2) Clear Roles and Responsibilities
3) Competence Commensurate with Responsibilities
4) Balanced Priorities
5) Identification of Safety Standards and Requirements
6) Hazard and Environmental Aspects Controls Tailored to Work Being Performed
7) Operations Authorization

The five Core Functions for integrated ES&H management that comprise the underlying process for any work activity that could potentially affect the public, workers, or the environment.

1) **Define the Scope of Work**
2) **Analyze the Hazards**
3) **Develop and Implement Hazard Controls**
4) **Perform Work Within Controls**
5) **Provide Feedback and Continuous Improvement**

5.0 Communication and Training Tools

5.1 Subcontractor Worker Safety Orientation

LBNL provided Safety Orientation: Each craft worker brought on site to perform "hands-on" work will participate in a safety orientation session. LBNL EH&S or Facilities Division will lead the orientation sessions. Orientation sessions will be held three times a week and will last approximately 30 to 45 minutes. All workers will view a video presentation that will cover the "top fifteen" safety topics (see Appendix A for a list of safety topics), an introduction to the principles of the LBNL LOTO process and procedures, as well as a reminder that LBNL process and procedures may be more rigorous than "industry standard" practices. The orientation will conclude with a brief question and answer session, to provide feedback and to clarify any topics addressed in the presentation. Each worker completing this orientation will be required to sign an acknowledgement that they have received this training and will be provided with a hardhat decal which will be an easily recognizable confirmation that they have completed the LBNL required orientation. An outline of the orientation topics is included in Appendix A.

In addition to the "top fifteen" safety topics the orientation will also cover the following policy points.

- LBNL Integrated Safety Management Core Functions
- Employee rights and responsibilities (Stop Work)
- Alcohol and Drug abuse policy
- Zero Tolerance for Safety Infractions
- First aid and medical facilities
- Accident and incident reporting procedures
- Protection of the environment (air and storm drains from construction pollutants)
- Emergency Contact Information (included in Appendix F)

LBNL provided LOTO Orientation: In addition to the safety orientation that each worker receives, workers performing Mechanical, Electrical and Plumbing (including underground utility installation) or any other work requiring the isolation and shut down of electrical or mechanical systems or energy sources, will receive a one hour orientation on the LBNL LOTO procedures and the requirements of NFPA70E.

Subcontractor provided Safety Training: Each subcontractor employee shall also undergo site specific safety orientation and training prior to performing any work on the project. All subcontractors shall maintain on the work site a detailed outline of the orientation and safety training, a signed and dated roster of all employees who have completed the safety orientation and training. Documents must be available upon request by the LBNL Project Manager. This practice conforms to the general requirements of the Cal/OSHA Construction Safety Orders.

5.2 Plan of the Day Meeting Guideline and Safety Briefings

LBNL has found that one of the recurring causes for safety violations is due to a lack of communication (LBNL to Subcontractor, subcontractors to their workers) regarding safety requirements and expectations for safety on our construction sites. We believe that the Plan of the Day (POD) meeting is our (LBNL's and subcontractors') most effective opportunity to communicate to the workforce the importance of safety. Included in Appendix B are the POD Meeting Guidelines and Safety Briefings, which is a guideline for conducting the POD meeting and a set of safety briefings which should be used to communicate to your workforce the importance of safety at LBNL.

As noted in Section 4.0, ISMS is LBNL's structured approach to safety. POD Meeting is an important part of the ISMS process, it is the opportunity for you and your workforce to discuss the work, identify the hazards, talk about how to control the hazards, and it's a chance to receive feedback from the people performing the work. Listed below is the suggested agenda for your POD meetings.

- Work Planned for the Day by each trade or sub. It is important to encourage participation by the workforce. The interaction between your subs may provide the additional benefits of coordinating the work.
- A Pre Task Hazard Analysis (PTHA), a discussion of the task to be performed, the hazards associated with that task and the control of those hazards. The PTHA is an integral part of the POD Meeting process in terms of defining the work, analyzing the hazard and developing the controls. The PTHA procedures and forms are included in Appendix H
- Permits (LOTO/shut downs, Penetration, Hot Work…etc.), review all the permits that affect the work planned for the day, and discuss the requirements and procedures for each permit.
- The Safety Briefing: It is important that your project superintendent or safety officer presents the safety briefing. The safety briefing does not need to take more than 5 minutes, but it will be important to communicate the key safety points on the safety topic of that day.
- Feedback from the Workforce: Encourage the workforce to voice their opinions and concerns regarding safety.

One day per week, the safety briefing portion of the POD Meeting will cover lessons learned, or a discussion of a safety incident or concern that may have occurred within the past week. Prepared safety topics will be covered for the remaining days.

A separate POD Meeting, to specifically discuss fall protection, will be held for any tasks requiring the use of fall protection (i.e. roof top work, work above 6', or work using personnel lifts).

5.3 Pre-Bid Job Walk, EH&S Safety Expectation Briefing

EH&S Construction Safety staff may provide a safety briefing at the pre-bid conference. The intent is to communicate to all potential bidders the LBNL Safety culture and safety expectations prior to submitting a bid to perform work here at the Lab.

5.4 Subcontractor Supervision and Management Safety Orientation

As part of the post award process a one hour meeting will be conducted and attended by the subcontractors' Project Principal, Project Manager, Superintendent, Safety Officer/coordinator, and general foreman, the LBNL Capital Project Department Head, the LBNL Chief Construction Manager, the LBNL Project Director, Project Manager, Construction Manager, the EH&S Construction Safety Manager and the EH&S Safety Engineer. This list of attendees may vary based on the size the of project and management staff assigned to the project. The topics for discussion will include LBNL safety Policies, Procedures and Requirements and LBNL's expectations regarding safety and subcontractor safety compliance; Roles and Responsibilities for job site safety; the LBNL permit process (specifically the LOTO Permit process); How does safety happen and what is successful safety compliance?

5.5 Quarterly Safety Meeting with Construction Subcontractors

Every three months, or more frequently if needed, the Facilities Division will invite all subcontractors either currently working or having recently worked at the Lab to participate in a roundtable safety meeting. Subcontractor participation is voluntary. The meeting is structured as an opportunity for subcontractors to provide feedback to LBNL on safety issues and safety process and procedure improvements. These meetings will typically last two hours. As a standing agenda item Facilities will focus a portion of each meeting on a review of LOTO policies and procedures. Emphasis will be placed on Publication 3000 Chapter 18.

5.6 Pre-construction Meetings and Submittals

5.6.1 Project Pre-construction or "kick off" meeting

Safety will be a main topic of discussion at the "kick-off" meeting. A sample meeting agenda is included in Appendix C.

5.6.2 Subcontractor Construction Safety Checklist

The preparation of a pre-job Construction Safety Checklist (a sample Checklist is provided in Appendix D) is the first step in the ISMS process of "defining the work". LBNL staff is available to assist you in completing the safety checklist. From this checklist you will identify the tasks you and your workforce will be performing. The next step will be to generate your Job Hazard Analysis or JHA's, which identify the job hazards and outline a plan to control those hazards. The JHA process is described in Section 5.6.5.

5.6.3 Site Specific Safety Plan

As required by your Subcontract, Section 013529, prior to starting work at the Lab you must prepare and submit a Site Specific Safety Plan. An outline for this Site Safety Plan is included in Appendix E.

5.6.4 Injury and Illness Prevention Plan (IIPP)

Another submittal required by your Subcontract is an Injury and Illness Prevention Plan or IIPP. The IIPP is also mandatory by Cal/OSHA regulation, which requires employers in California to have an effective written Injury and Illness Prevention Program (IIPP). The benefits of an effective IIPP include improved workplace safety and health, better morale, increased productivity, and reduced costs of doing business.

5.6.5 Job Hazard Analysis (JHA's)

Before you perform **hands-on work** at an LBNL facility, you are required to read this handbook, complete a Subcontractor Job Hazards Analysis (JHA), attend a pre-job meeting, and sign and date the JHA.

What Is Defined as Hands-On Work?

The following activities are examples of hands-on work: General construction activities(including mobilization); operation of construction equipments; use of hand or power tools; the installation, start up and commissioning, repair, or service of a device, apparatus, machine, or mechanism; material handling; handling or disposing of chemicals, compressed gas, or a hazardous, radioactive or bio-hazardous material.

Activities NOT defined as hands-on work: Office & administrative work; computer programming; attending or making a presentation or providing classroom training; supervision of a worker(s) who is not performing hands-on work; document archiving; financial auditing.

All subcontractors shall prepare a written Job Hazard Analysis (JHA) for each type of construction task or activity in the subcontract and submit it for review by LBNL. This submittal must be approved by the LBNL Project Team. This JHA process fulfills the identifications of hazards and controls in the ISMS and is part of the documentation required for a Cal/OSHA IIPP. The JHA shall be performed in accordance with the OSHA 3071 JHA processes.

In general the JHA will include:

- Description of work phase or activity
- Identification of potential hazards associated with the activity
- Address further hazards revealed by supplemental site information (e.g., site characterization data, as-built drawings) provided by the subcontractors construction manager.
- A list of the Subcontractor's planned controls to mitigate the identified hazards
- Identification of specialized training required
- Identification of special permits required
- Name of the Subcontractor's competent persons responsible for inspecting the activity and ensuring that all proposed safety measures are followed.
- Signature block, to be signed by workers performing the task

Construction activities for which a Job Hazards Analysis may be required include, but are not limited to: Roofing; hoisting and handling of materials; use of personnel lifts (Boom and Scissor Lift); excavations, trenching and drilling; concrete placement and false work; welding and steel erection; work performed six foot or higher above ground; electrical work; demolition; work in confined spaces; work causing the release of silica (demolition or drilling of concrete or work with materials that contain silica); work with epoxy coatings; work with or around hazardous materials; work on hilly terrain; use and handling of flammable materials.

5.6.6 Material Hazards Communication

All subcontractors are solely responsible to abide by the Hazard Communication Standard (29 CFR 1910) in regards to the training of their own employee, their MSDS Record keeping, their notification procedures, and any other aspects of the requirement.

As part of the submittal process subcontractors shall transmit to the LBNL Project Manager copies of their Hazard Communication Program along with the MSDS of any chemical materials brought on to the job site. This submittal process is an ongoing requirement; this submittal information shall be provided to the LBNL Project Manager when any new chemical substances are brought onto the job site.

The Exchange of MSDSs on this project shall take place initially when the subcontractor comes onto the site, at regular site safety meetings, and/or at any other designated time by the LBNL Project Manager.

6.0 Permits: Subcontractor Safety and Work Controls

LBNL has a number of permits as part of the hazard mitigation and work control process. Each of these permits includes a procedure for Subcontractor Pre Job Safety Briefings. Section 6.0 will discuss the permits required to perform specific tasks, when permits are required, and processes and procedures of those permits. In addition, the ISMS process requires that if the scope of work or the means and methods of performing the work are changed or modified then the work controls (permits, JHA.'s etc…) also must be re-evaluated and modified and in some cases additional permits must be obtained.

6.1 Lock Out/Tag Out (LOTO) Permit (PUB 3000 Chapter 18)

LOTO is required whenever start up, testing, adjustment, commissioning, service, maintenance, or modification is being performed on equipment or apparatus in which the unexpected energization or start-up of the equipment, or the release of stored energy, could cause injury to people or damage to equipment.

LOTO Permit Tracking website/log on https://www.quickbase.com/db, the LBNL Project team can provide password access and assist you in tracking your LOTO permit requests.

LBNL has a "first lock on, last lock off" policy; this means that LBNL Maintenance & Operations personnel will assist and oversee the LOTO process by applying the first LOTO lock before the start of work and will require written confirmation that the work is completed prior to removing the last lock and re-energizing any mechanical or electrical system. This does not relieve the subcontractor from their LOTO responsibilities.

The LOTO program applies to all workers who may be exposed to hazardous energy while performing any servicing, maintenance, or modification activity.

The lockout/tagout and verification procedures identified in this document must be strictly followed when it is necessary to work on any equipment that generates, holds, or may release, any form of hazardous energy while the equipment is shut down, including, but not limited to: Electrical; Mechanical (Rotational and Gravity); Chemical; Pressure or Vacuum (Hydraulic or Pneumatic); Ionizing and non-ionizing radiation sources; and Thermal.

Lockout/Tagout and Verification Procedures

Before starting any LOTO procedure, the LOTO-Authorized Employee(s) performing the work shall physically locate and identify all isolating devices to be sure which switches, valves, or other energy isolating devices apply to the equipment or apparatus to be locked out. Any questionable identification of electrical or other energy sources shall be resolved by the LOTO-Authorized Employee(s) with their supervisor before proceeding.

LOTO Procedure

Step 1 – Preparation

Review the written procedure, LOTO-Authorized Employee must obtain and follow the equipment-specific written procedure.

Assess energy type and magnitude. The LOTO-Authorized Employee must assess the type, magnitude, and hazards of the energy to be controlled.

Determine methods of energy isolation. The LOTO-Authorized Employee must determine the appropriate methods of controlling the hazardous energy.

Step 2 – Notification

Notify all affected employees. The LOTO-Authorized Employee must notify all Affected Employees of the impending shutdown.

Step 3 – Shutdown

Verify that it is safe to shut down equipment. The LOTO-Authorized Employee must verify that it is safe to shut down the equipment.

Perform normal equipment shutdown. The LOTO-Authorized Employee must turn off or shut down the equipment using established methods for that equipment.

Step 4 – Isolation and Verification

Isolate all energy sources. The LOTO-Authorized Employee must operate energy-isolating device(s).

Verify that the correct energy isolation device has been operated. The LOTO-Authorized Employee must take steps to ensure that the means used for energy isolation correctly correspond to the equipment on which LOTO is being performed.

Note: For verification of electrical energy isolation, a best practice procedure (if safe to do so) may include an "on-off-on" procedure, wherein: (1) the equipment is placed in an operating condition; (2) the disconnect is operated; (3) the equipment is confirmed to have switched off; (4) the disconnect is re-energized; (5) the equipment is confirmed to have switched on; (6) the disconnect is operated; (7) equipment is confirmed to have switched off.

Step 5 – LOTO Device Application (placing LOTO lock)

Lock out energy sources. A red lock must be affixed to hold the energy-isolating device in an off or safe position that physically prohibits normal operation of the energy-isolating device. Each LOTO-Authorized Employee must apply their personal LOTO device whenever servicing, maintaining, or modifying machinery or equipment, regardless of the duration of the job or their proximity to the energy-isolating device (e.g., circuit breaker, switch, or valve). **Write name, date, contact number, purpose of LOTO, and any other relevant information on the tag, and apply with lock or plastic locking tie.**

Step 6 – Additional Measures if Necessary

Insert physical restraints or disconnect components. Insert blocks or chocks for moving or raised parts, insert blind flanges for pressurized piping, disconnect springs, etc...

Release stored energy. The LOTO-Authorized Employee must completely release or otherwise control any stored energy and block any unexpected motion. The equipment must be in a zero energy state.

Step 7 – Isolation Verification Confirmation

Attempt to restart the equipment. The LOTO-Authorized Employee must physically attempt to operate the energy-isolating device and attempt to restart the equipment using the normal equipment controls.

Test equipment for zero-energy state. The LOTO-Authorized Employee must test potential energy sources using appropriately rated instruments. Each LOTO-Authorized Employee must personally witness or verify the absence of hazardous energy, or assure that the verification has been performed. Any instrument used to test for voltage, pressure, or temperature must be checked for proper operation both before and after use. If the LOTO-Authorized Employee is not qualified to test the energy being isolated, he or she must ensure that the energy is tested by a qualified person.

Step 8 – Keeping Devices in Place

The lock and tag shall remain in place until work on the equipment is 100 percent complete

Release from LOTO Steps

Step 1 – Preparation & Notification

Notify all Affected Persons that the system is to be returned to service. Ensure all persons remain clear of the equipment point of operation or hazard zone.

Clear all tools and personnel. The LOTO-Authorized Employee must check the work area to ensure that all tools, debris and personnel are at a safe distance from the equipment.

Replace safety guards. The LOTO-Authorized Employee must check the equipment to ensure that any removed guards are reinstalled.

Step 2 – Removal of Additional Devices

The LOTO-Authorized Employee must remove any additional devices applied under LOTO Application, Step 6. Also remove all safety grounding devices.

Verify that it is safe to reenergize. The LOTO-Authorized Employee must verify that the work for which the LOTO was applied has been completed and that it is safe to reenergize equipment.

Step 3 – Removal of All Locks and Tags

Remove lock(s) and tag(s). Each LOTO device must only be removed by the LOTO-Authorized Employee who applied it. **If the person who placed the locks and tags is not available, the procedure for Emergency Removal of LOTO Devices must be followed (see PUB 3000 Section 18.9).**

Additional requirement regarding the LOTO process can be found by review in PUB 3000 Chapter 18 and NFPA 70E Section 120.

6.2 Energized Work Permits

Energized Electrical Work Permits (EEWP). All conductors are assumed to be energized until they have been de-energized, tested, locked, and tagged. Subcontractor employees are not permitted to be within the Limited Approach Boundary of uninsulated energized electrical parts without an EEWP. This includes testing, troubleshooting, inspecting, and nonelectrical work within the Limited Approach Boundary. Refer to PUB 3000 Chapter 8, for additional information and requirements.

- You can obtain an EEWP online, at http://electricalsafety.lbl.gov. Do not open covers on energized equipment without first obtaining an EEWP.
- LOTO verification testing is treated as energized work, but is covered by the LOTO permit. An EEWP is not required.
- Once the EEWP has been approved, you must conduct a pre task briefing with all of the workers, explaining to them the scope of the EEWP and their respective roles and responsibilities.
- Any changes to the EEWP may be written directly on the permit, and must be initialed by all workers involved in the LOTO. In addition, the LBNL Electrical Safety Engineer must approve and initial the changes.

6.3 Hot Work Permit

LBNL's program to reduce fire hazards includes a hot work permit system. Permits are required for any operation (i.e., hot work) that produces flames, sparks, heat, or a spark-producing operation; this includes but is not limited to the following tasks: Welding and allied processes; Heat treating; Grinding; Thawing pipe; Powder-driven fasteners; Hot riveting; Torch applied roofing in conjunction with the requirements of NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolitions Operations*; Similar operations producing or using a spark, flame, or heat .

Note: A fire detection system may have to be impaired temporarily while this activity is being carried out. To obtain a permit or additional information prior to start of work, call the Berkeley Lab Fire Department, ext. 6015.

For more information on the details of the Hot Work Program refer to PUB 3000(PUB 3000 Chapter 12.6).

6.4 Penetration Permits

The Penetration Permit procedure defines the steps necessary for the penetration of ground, walls, or other existing surfaces. This permit procedure must be completed prior to beginning any penetration action in any surface, to a depth greater than *1-5/8* inches. LBNL's biggest concern is preventing contact with live electrical conductors or other significant hazards (i.e. Utility lines, natural gas, water lines, compressed air lines, etc). Excavation within 30 inches of a marked or exposed utility must excavated by "hand" using non-destructive means, such as an air knife, shovel, vacuum, chipping gun with a spade bit, or other methods approved by LBNL.

The permit is valid for 30 calendar days from the time of issuance. You may request a 30-day extension, but only one 30-day extension is permitted. The permit must list special conditions and potential hazards and controls, and clearly identify equipment and underground utilities that will be affected.

Penetration Permit only addresses the hazards and controls directly related to surface penetration. The permit does not address other hazards such as trench access, shoring, traffic control, exposure to chemicals, confined spaces, utility isolation, LOTO, etc.

Exceptions: Staking in soil using wood stakes no deeper than 6 inches is permitted without a Penetration Permit. No Penetration Permit is required for gypsum board (sheet rock) wall penetrations provided that the area has been swept for active and passive electric current, has been cleared of asbestos containing materials and radiologic contamination, and both sides of the wall have been visually inspected.

6.5 Fall Protection Plan and Matrix

At LBNL, for work performed on any work surfaces higher than 6 feet fall protection is required at all times. When feasible, existing work surfaces higher than 6 feet shall be modified to eliminate the need for fall protection. Eliminating the need for fall protection may be accomplished through the application of engineering controls (such as lowering the work surface or providing barriers such as parapets that prevent contact with the leading edge) or administrative controls (such as changing a process, sequence, or procedure so that workers do not need to work at heights). A written fall protection plan is required for any task requiring fall protection. Subcontractors will prepare and submit for LBNL approval this fall protection plan, which will identify hazards associated with the work and the safety controls (fall protection) used to control those hazards. Also, as part of the daily PTHA process the LBNL Construction Manager will prepare a fall protection matrix, review this document with you and your workers, and discuss the fall protection to be used for each task.

Refer to PUB 3000 Chapter 30 for additional information.

6.6 Confined Spaces

Permit-Required Confined Spaces (PRCS) at Berkeley Laboratory may be entered only after a written and authorized Confined Space Entry Work Permit (Permit) has authorized that entry, and all requirements of this program for safe entry are accomplished. This requirement extends to LBNL employees and subcontractors operating in LBNL PRCS. The Confined Space entry pre-task process is specified in PUB 3000, Chapter 34.

6.7 Radiological Work Permit (RWP)

If your work involves radiological hazards a RWP is required. The RWP Application process is outlined in PUB 3000 Chapter 21, Section 21.14, Work Process B. The LBNL Project Team and EH&S staff can assist you with the application process.

Once the RWP Application is completed, it will be submitted to the RWP Program Manager for review and approval. The approved RWP will specify the work controls necessary to complete the project. A copy of the approved RWP must be maintained at the work site. The original RWP must be kept in the Radiation Protection Group (RPG) RWP files. All workers must have training commensurate with radiation hazards prior to performing work authorized by an RWP. EH&S Radiation Worker or equivalent training is generally required. (See PUB 3000 Chapter 21, Section 21.4.3, *Training*.)

The RWP must be amended if there is a change to the scope of the work, or if the RWP does not specify adequate radiological controls or radiological conditions. Major amendments require the generation of a new RWP and require the same review and approval process as a new RWP.

Throughout the course of the RWP work, RPG staff will monitor the radiological conditions and the conduct of work in accordance with the terms of the RWP. At the conclusion of the work activity, RWP closeout surveys and audits will be completed by LBNL RPG personnel.

7.0Quality Assurance (verification of goal achievement): Use the "Plan of the Day" as part of the feedback loop: As noted in Section 5.2 worker feedback during the POD meeting is an important part of the ISMS process. Those performing the work are best able to communicate how effective the safety training and safety procedures are working. The LBNL Project Team will be actively involved in gathering this worker feedback by participating in (not just observing) the Plan of the Day meeting.

7.2 Safety Observation Reports for monitoring compliance: The Facilities Project team members and the EH&S safety staff will be monitoring safety performance on a daily basis and will maintain a record of safety observations using Predictive Solutions DBO2 ™ Safety Observation/Recording software. If you have questions regarding the daily observations or wish to receive copies of the safety observation reports, please contact the LBNL Project Team members.

7.3 Metric Analysis of DBO2 Safety Observations: LBNL will be tracking observations both safe and "at-risk" and looking for trends to verify the effectiveness to worker safety training. This trend analysis is another important element of the safety performance feedback loop. The safety observations from the DBO2 database will be analyzed to identify trends in safety performance (both positive and negative). The positive trends can be a morale boost, the negative point out an opportunity to improve. This metric/trend analysis will be shared with you as part of the feedback/improvement process.

7.4 Metric Analysis of Hours Worked verses Recordable Safety Incidents and First Aid injuries: Tracking the number of recordable safety incident serves two purposes; tracking the total number of hours work without incident is a way to provide that positive feedback to worker. There is a positive reinforcement and moral boost when worker receive an acknowledgement excellent performance. LBNL has in many of its subcontracts incentive programs to reward worker safety performance and to commemorate reaching safety milestones (i.e. 50,000 or 100,000 hours worked without injury). The other purpose is to track trends, identify potential problems, and take a proactive approach to the improvement of safety performance.

Appendices

Appendix A: Safety Orientation Training Outline

Appendix B: Plan of the Day Meeting Safety Briefing Program

Appendix C: Pre-Construction Meeting Agenda

Appendix D: Construction Safety Checklist

Appendix E: Requirements for Site Specific Safety Plan

Appendix F: Emergency Contact Information

Appendix G: HSS Overview of 10CFR851

Appendix H: Pre-Task Hazard Analysis

Appendix I: Quick Reference Guide to LBNL Construction Safety Requirements

Appendix A: Subcontractor Safety Orientation Outline

Each craft worker brought on site to perform work will participate in a safety orientation. This orientation session will take 30-45 minutes. All workers will receive orientation training that will include an introduction to Safety Culture here at LBNL, and a basic orientation on the "top fifteen" safety topics, which will include the principles of the LBNL LOTO process and procedures. HVAC Technicians, Mechanics, Electricians and Plumbers will receive the same training but will receive additional detailed training regarding the LOTO permit process and release of LOTO process. Each worker completing this orientation will be required to sign an acknowledgement that they have received this training and will be provided with a hardhat decal which will be an easily recognizable confirmation that they have completed the LBNL required orientation.

Orientation Topic Outline (30 to 45 minutes)

"Top Fifteen" Safety Topics

1. Job Hazard Analysis
2. LOTO Permits and Procedures/NFPA 70E
3. Penetration Permit and Procedures
4. "Hot Work" Permits
5. Fall Protection
6. Traffic Control
7. Respirator Training
8. Ladder Safety
9. Trench/Excavation Shoring
10. Confined Spaces
11. Cranes and Hoisting
12. Scaffolding
13. Aerial and Scissors Lifts
14. PPE
15. Hand and Power Tool safety

In addition to the "Top Fifteen" safety topics the orientation training will also cover the following policy points.

- LBNL Integrated Safety Management Core Functions
- Employee rights and responsibilities (Stop Work)
- Alcohol and Drug abuse policy
- Zero Tolerance for Safety Infractions
- First aid and medical facilities
- Accident and incident reporting procedures
- Protection of the environment (air and storm drains from construction pollutants)

Training Topic Outline (1 hour training)

- NFPA 70E Guidelines and requirements
- In Depth Instruction on LBNL LOTO Process and Procedures

1. MRO assistance to identify LOTO requirements
2. LOTO Permit Process
3. LOTO Release Verification

Appendix B – Plan of the Day Safety Meeting Guidelines and Safety Briefings

Plan of the Day Meeting & Safety Briefings V 1.1

1.0 Introduction:

Welcome to LNBL and thank you for participating in the LBNL mission "To Enable World-class Science". Every construction and maintenance project that subcontractors perform here at LBNL supports scientific research. The work you do for LBNL is important.

LBNL's EH&S and Facilities staff have a common set of goals, which we know you share, those are: Safety, Customer Satisfaction, Teamwork and Efficiency. As you can see Safety is our first priority.

We also want to reinforce that the Facilities Project Team and EH&S Safety Staff are your partners in constructing projects here at LBNL. Our goal is open communication, which is key to this partnership. LBNL has found that one of the reoccurring causes for safety violations is a lack of communication (LBNL to subcontractors, subcontractors to their workers). These communication breakdowns usually center around the requirements and expectations for safety on our construction sites. We believe that the Plan of the Day (POD) Meeting is our (LBNL's and subcontractors') most effective opportunity to communicate to the workforce the importance of safety.

The objective of this manual is to communicate our expectations regarding safety and to provide you with a guideline for conducting your POD Meetings. Included are a Pre-Task Hazard Analysis form and checklist and a set of safety briefings which should be used to communicate to your workforce the importance of safety at LBNL.

2.0 Policies and Procedures

LBNL has a structured approach to safety, called Integrated Safety Management or "ISM". ISM has five Core Functions:

1) **Define the Scope of Work**

2) **Analyze the Hazards**

3) **Develop and Implement Hazard Controls**

4) **Perform Work Within Controls**

5) **Provide Feedback and Continuous Improvement**

The POD Meeting is an important part of the ISM process, it is the opportunity for you and your workforce to discuss the work, identify the hazards, talk about how to control the hazards, and it's a chance to receive feedback from the people performing the work. So the POD Meeting really covers 4 of the 5 ISM Core Functions.

Plan of the Day Meeting & Safety Briefings

V 1.1

You may choose to organize the POD Meeting in the way that works best for your company, but it should include the elements listed below (Work Planning, Pre Task Hazard Analysis, Permits, Safety Briefing, and Feedback).

- Work Planned for the Day by each trade or sub. It is important to encourage participation by the workforce. The interaction between your subs may provide the additional benefit of coordinating the work.

- A Pre Task Hazard Analysis (PTHA), a discussion of the tasks to be performed, the hazards associated with the tasks and the control of those hazards. Forms for this PTHA are attached.

- Permits (LOTO/shut downs, Penetration, Hot Work…etc.), review all the permits that affect the work planned for the day, and discuss the requirements, procedures, and safety controls for each permit.

- The Safety Briefing: It is important that your project superintendent or safety officer presents the safety briefing. If your firm has its own safety briefing information you should also present that information. If you have our own set of prepared briefings you should review that information with the LBNL project staff, and those briefings can be presented in addition to those provided by LBNL. The safety briefing does not need to take more than 5 minutes, but it will be important to communicate the key safety points on the safety topic of that day. The briefing must include sign in sheet, signed by all workers at the briefing. You may submit the "Plan of the Day" meeting sign-in sheet in lieu of the sign in logs which accompany the safety briefings.

- Feedback from the Workforce: Encourage the workforce to voice their opinions and concerns regarding safety.

Note: A separate POD Meeting, to specifically discuss fall protection, will be held for any tasks requiring the use of fall protection (i.e. roof top work, work above 6', or work using personnel lifts).

In order to document the transmission of this information, LBNL will request that the subcontractor and its onsite representatives acknowledge that they have received, reviewed and understand the intent and requirements of this briefing manual.

Subcontractor	

	Name (print)	Signature	Date
Subcontractor's Representative			
LBNL Project Representative			

FACILITIES CAPITAL PROJECTS
SUBCONTRACTOR PRE-TASK HAZARD ANALYSIS WORKSHEET

Work Request #_____ **Task**_____ **Location of Task**_____ **Date** _____

MAJOR WORK STEPS OF TASK	POTENTIAL HAZARDS	CONTROLS / SAFETY PLAN	TOOLS REQUIRED

Task Specific Required Inspection	
Daily Lift Inspection	Inspected By/Name
Harness Inspection	Inspected By/Name
Fire Extinguisher Inspection Current	Inspected By/Name
Cords – Properly Inspected	Inspected By/Name
All Existing Systems Enabled	Inspected By/Name

Work Area Questions

Is there adjacent work and/or co-occupancy in work area? ___Yes ___No
Other workers adjacent above or below work area? ___Yes ___No
Did you notify them of your presence? ___Yes ___No
Did you coordinate with adjacent work? ___Yes ___No
Can you proceed with working safely? ___Yes ___No
Barricades Set Up ___Yes ___ No Removed at end of task ___Yes ___No

Pre-Task Review has been completed and each employee is taking the responsibility to ensure that all required training for this work activity is current, and that they are competent and qualified on all required tools/equipment – Print Name and Initial

_____ _____

_____ _____

_____ _____

_____ _____

Subcontractor Foreman/Superintendent Signature: **Date:**

Instructions: Complete this form per task, per day. **1.** Fill in work request number, task, location and date. **2**. List **major work steps** of this task. **3**. Using the back side of this form as a guide, walk-through the work area and list **potential hazards** involved with each work step. **4**. List controls or **safety plan** to mitigate those hazards. **5**. List **required tools** to perform the job safely. **6**. Have each worker review the work area; assist with completing this form and print name and initial. **NOTE**: Multi Craft jobs require each discipline to complete separate form for their task. Review with all workers in work area. Each worker prints name and initials on all worksheets. **7**. Submit a copy of this form to the Construction Manager at completion of day. **NOTE: Work shall STOP if conditions change, job scope changes, or a deficiency in the plan is noted. If any injuries or incidents occur, respond as appropriate, than contact the Construction Manager, Inspector, & Subcontract Administrator immediately** Rev 1 – 01/12/05

Permits/Required Reviews

- ☐ Construction Safety Video
- ☐ Soil/Concrete Permit Video (n/a)
- ☐ Facility Work Permit
- ☐ Asbestos Work
- ☐ Concrete Penetration/ Jack hammering Permit
- ☐ Confined Space
- ☐ Critical Lift
- ☐ Building Drain Work
- ☐ Excavation /Shoring Permit (Underground Location)
- ☐ Fire/Burning Permit
- ☐ Hoisting & Rigging
- ☐ Boom Proximity, Assembly/Brkdown
- ☐ Lead Abatement
- ☐ Lock Out/Tag Out
- ☐ Pneumatic Test
- ☐ Roof Access Permit
- ☐ Steel Erection/Decking/ Grating Plan
- ☐ Working Energized Circuits & Equipment
- ☐ Low Voltage Outage Permit

Required PPE

- ☐ Hard Hat/Correct Class
- ☐ Ear Plugs/Ear Muffs
- ☐ Eye Protection
  - Safety Glasses
  - Face Shield
  - Chemical Goggles
  - Welding Hood
- ☐ Hand Protection
  - Arm Sleeves
  - Cut-Resistant Gloves
  - Welders Gloves
  - Surgical Gloves
  - Rubber Gloves
  - Elect Insulated Gloves
  - Other _____
- ☐ Foot Protection
  - Sturdy Work Boots
  - Safety Toe Boots
  - Rubber Boots
  - Rubber Boots cover
  - Dielectric Footwear
- ☐ Respiratory Protection
- ☐ Special Clothing
  - Tyvek
  - Nomex III
  - Rain Suit
  - Safety Vest
  - Other _____
- ☐ Fall Protection
  - Harness
  - Double Lanyard
  - Tool Tethers
  - Anchorage Point
  - Retractable Device
  - Horizontal lifeline system
  - Fall Clearance Distance
  - Fall Rescue/Retrieval Plan

Hazards	Safety Plan
☐ Overhead Utilities	☐ De-energization req. ☐ Insulation blankets req. ☐ Wire watcher req. ☐ Req. clearance distance ☐ Safe work zone marked
☐ Crane or other Lifting Equipment Lifting, Rigging Objects	☐ Signalman assigned ☐ Tag lines in use ☐ Lifting equip inspected ☐ Area around crane barricaded ☐ Rigger Plan/Personal Protected
☐ Aerial Lift/Platform	☐ 100% Tie Off ☐ Daily Inspection ☐ Training Current ☐ Access Permit/Custodial Possession Placard
☐ Electrical	☐ Lock out/Tag out ☐ Required Permit ☐ Multi Energized source? ☐ Confirm equip is de-energized ☐ Review elect safety procedures
☐ Excavations	☐ Required Permit ☐ Inspect prior to entering ☐ Barricades ☐ Proper sloping/shoring ☐ Access/egress provided
☐ Fire Hazard = Cut, Weld, Burn, Grind, Solder	☐ Required Permit ☐ Fire Extinguishers ☐ Fire Watch ☐ Adjacent areas protected ☐ Unnecessary flammable material removed
☐ Vehicular Traffic and/or Heavy Equipment	☐ Traffic Barricades ☐ Cones ☐ Signs ☐ Flagman ☐ Lane closure ☐ Communication with equipment operator ☐ Surface condition
☐ Noise > 85 db	☐ Hearing protection is required ☐ Ear plugs/Muffs
☐ Hand & Power Tools	☐ Inspect general cond. ☐ Identified PPE required for each tool ☐ Review safety operation manual ☐ Guarding OK ☐ GFCI in use
☐ Hand Hazards	☐ Check for sharp tools, materials and equipment ☐ PPE gloves ☐ Protect sharp edges as necessary
☐ Manual Lifting	☐ Review proper lifting tech. ☐ Hand protection req ☐ Clear pathway ☐ Back support belts ☐ Identify material requiring lifting equip
☐ Ladders	☐ Inspect general cond before use ☐ Quarterly Ladder inspection ☐ Ladder tied off ☐ Proper angle/placement ☐ Review ladder safety
☐ Scaffolds	☐ Inspect general cond before use ☐ Tags in place & Properly secured ☐ Footings adequate ☐ Toe boards used ☐ Material properly stored
☐ Slips, Trips, Falls	☐ Inspect for trip hazards ☐ Extension cords properly secured ☐ Work zone free of debris ☐ Tools & Material properly stored
☐ Pinch Points Exposed (Rotating Equipment)	☐ Review area for potential pinch points or exposed rotation equipment ☐ Near operating equip? ☐ Hand/Body position ☐ Loose clothing?
☐ Working w/Chemicals	☐ The task creates potential for direct contact with hazardous chemicals ☐ Review MSDS ☐ Have proper containers & labels ☐ PPE
☐ Heat / Cold Stress Potential	☐ Heat stress monitoring (>85 degrees) ☐ Liquids available ☐ Cool down periods ☐ Sun Screen ☐ Review Heat/Cold stress
☐ Body Mechanics	☐ Proper clothing ☐ Wind chill (<32degrees) ☐ Warm up periods
☐ Environment (Endangered Species)	☐ Air emissions ☐ Water discharge ☐ Hazardous/other wastes ☐ Awareness of endangered Species and habitant area
☐ Natural or Site Hazards	☐ Weather ☐ Terrain ☐ Adjacent operations ☐ Biological hazards ☐ Animal/reptiles/insect hazards
☐ Barricades/Covers for Overhead Work	☐ Caution barricade tape required ☐ Danger barricade tape required ☐ Warning signs ☐ Cover over opening ☐ Rigid railing required
☐ Underground Utilities (Line Locating)	☐ Review as builts ☐ Subsurface surveys ☐ Received dig permit ☐ Required clearance distance ☐ Safe work zone marked ☐ Walk around
☐ Transporting Materials on Vehicle	☐ Tie down all loads ☐ Secure materials on racks ☐ Flag Ext Material
☐ Moving/Falling objects from height	☐ Tether small objects ☐ Use rope, canvas bag ☐ Barricade around potential fall area
☐ Pressurized gas hazard	☐ LOTO process ☐ Take care near small fragile lines
☐ Laser hazard/Beam path	☐ Stay outside of identified areas ☐ Proper laser eyewear
☐ O2 Deficiency, Argon hazard And/or Freon	☐ Observe signs ☐ Use O2 monitor ☐ Involve ESH Team ☐ Sniff before entry
☐ Wall/Ceiling Penetration	☐ Scan area where penetration will take place ☐ Perform Walk Around
☐ Magnetic Field Hazards	☐ No pacemakers, defibrillators ☐ Heed warning signs

BERKELEY LAB
LAWRENCE BERKELEY NATIONAL LABORATORY

Topic Index
LBNL Construction Safety Briefings

	Topic	Date Completed	Topic Leader
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2	Back Injury Prevention		
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5	Excavation & Trenching Safety		
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8	Fire Extinguishers		
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Sign In
LBNL Construction Safety Briefing

Briefing Topic:	
Briefing Date:	
Briefing Leader:	

	Print Name	Signature	Company Name	Badge Number LBNL Employee
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Sign In
LBNL Construction Safety Briefing

Briefing Topic:	
Briefing Date:	
Briefing Leader:	

	Print Name	Signature	Company Name	Badge Number LBNL Employee
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LBNL Construction Safety Briefing

AERIAL LIFTS & ELEVATED WORK PLATFORMS

Aerial lifts and elevated work platforms (such as scissor lifts) are two pieces of equipment that many construction workers can't imagine working without. Such equipment, collectively called aerial lifts by most workers, provide access to work areas that could otherwise only be reached from scaffolding or ladders. When used correctly, aerial lifts provide a safe and efficient method for working at heights. But as with any equipment, there are right and wrong ways to using aerial lifts safely.

The most important tip to remember before operating any aerial lift is to *always read and follow* the manufacturer's safety and operation manual. This information must be kept on the lift, and can normally be found inside a PVC tube or black box that is attached to the equipment frame or guardrail.

Safe Operating Procedures for Aerial Lifts and Scissor Lifts:

- Only trained and authorized personnel can operate aerial lifts and scissor lifts. Training must be specific to the make and model number of the lift used.
- Always check for overhead obstructions & be aware of your surrounding before driving, moving or elevating the platform.
- Refuel equipment only when the unit is turned off. If battery powered, the batteries should be charged only in a well ventilated area away from any open flame.
- Prior to each shift, a safety inspection must be completed by the operator. This includes both a visual inspection and a function test. If a problem is found, the unit shall be "RED TAGGED" & removed from service.
- Per LBNL's requirement, fall protection is required at all times in aerial lifts. Fall protection is required for scissor lifts when the lift is equipped with manufacturer provided fall protection anchorage points:
    - An LBNL Fall Protection Matrix and inspection of all fall protection equipment is required prior to the start of work.
    - A full body harness with 3' to 6' adjustable lanyard is required.
    - The LBNL Fall Protection Matrix must approve any work task that requires a worker to open or remove the access door or exit the aerial lift or scissor lift while raised.
- A second operator is required as a spotter in case of an emergency. The spotter must be within sight or sound of the lift operation.
- Never stand or put planks on the railing of the scissor lift. Never place a ladder on the platform to gain additional height.

LBNL Construction Safety Briefing

BACK INJURY PREVENTION

Most of you have probably heard that in order to lift safely, you must lift properly. You're told to "bend your knees not your back," and "don't twist as you lift." This is good advice but sometimes seems to go against human nature. Yet, there *are* actions you can take to help you lift properly.

1. **Get as close to the load as possible.** The further the load is from the center line of your body, the greater the strain imposed on your back. If need be, squat down to lift the load and pull it between your legs. This gets it closer to the center of your body and helps prevent the need to bend at the waist.
2. **Avoid picking up heavy objects placed below your knees.** Heavy objects should be placed and stored above knee level and below shoulder level whenever possible. If you suspect the load is too heavy to be lifted comfortably, do not chance it. Use a mechanical aid, break the load down into its component parts, or get help. The most common cause of back injury is overloading.
3. **Keep your back straight.** This means don't bend at the waist when reaching to lift an object. Keep the natural arch in your lower back, which distributes the load evenly over the surface of spinal disks, and is less stressful than if the disk is pinched between vertebras. Bending principally from the hips is acceptable if you maintain the arch in your back, rather than bending at the waist.
4. **Glue your hand to your thigh.** If you carry a load in one hand, such as when carrying a tool box, place your free hand on the outside of your thigh and mentally "glue" it into position. This will help you maintain correct back alignment rather than lifting and tilting to one side. When carrying a heavy load, side bending can be just as stressful to the spine as bending forward.
5. **Tighten your stomach muscles.** This technique helps prevent your spine from twisting. If you lift a load and need to place it off to one side, turn by moving your feet. After repeated lifts you might find yourself getting a bit sloppy and forgetting to move your feet. You can overcome this tendency if the place you set the load down is at least one step away from where it is lifted.
6. **Stay in good physical condition.** A protruding stomach is an extra load carried away from the center line of the body, and prevents you from keeping a lifted object close-the number one rule for back care. When you bend at the waist to lift, due to the leverage principal, the load is up to 10 times heavier than its actual weight. A "pot belly" puts extra, stressful weight on the spine.
7. **Stretch and loosen up before work.** Research has shown that trunk flexibility and mobility is significantly lower in the morning than later in the day, increasing the number and severity of back strains at this time. A few minutes of stretching can warm up cold stiff muscles and tendons and help you avoid an injury. All professional athletes know this-"industrial athletes" should too!

LBNL Construction Safety Briefing

CARBON MONOXIDE (CO)

Carbon monoxide (CO) is a clear, odorless gas that is heavier than air and dangerous to human health. Unless adequate ventilation or other precautions are taken, carbon monoxide emissions can be created on construction worksites from gasoline or diesel powered heavy equipment, pressure washers, air compressors, forklifts or other petroleum-fired machinery.

The chemical makeup of CO is one carbon molecule linked to one oxygen molecule. When inhaled, the carbon molecule will not allow the lungs to absorb oxygen into the blood stream. Without sufficient oxygen in the bloodstream, you will slowly suffocate to death. The maximum level of CO allowed in the work area is 25 parts per million. This is an extremely small amount of CO. To put this into perspective, think of a room that holds 1 million ice cubes and then remove 25 cubes from the room. Those 25 ice cubes are the maximum amount allowed in a work area.

What does this mean for construction workers? Since CO is heavier than air, it will have a tendency to fill working spaces, especially low spots, and "push out" (displace) the oxygen. Since CO is clear and odorless, you will not be able to tell this is happening.

Symptoms:

As CO displaces oxygen in a work area, workers are affected in the following manner:

- Slight headache and dizziness
- Nausea
- Drowsiness and an euphoric feeling
- Unconsciousness
- Death

Prevention:

1. Inspect the jobsite and remove any gasoline or diesel powered equipment located near work areas that may cause exhaust fumes to enter the space.
2. VENTILATE, VENTILATE, VENTILATE! ! !
3. If gasoline or diesel powered equipment is being used on the worksite, frequently monitor workspaces for CO with testing equipment.
4. Observe employees for signs of CO exposure.
5. Train workers about the early symptoms of CO exposure.

LBNL Construction Safety Briefing

EMERGENCY EYEWASH & SAFETY SHOWERS

If you get foreign particles or chemical in your eyes or a chemical spill on your body, an emergency eyewash station or safety shower is the most important initial step in first-aid treatment. Chemical burns to the eye are among the most *urgent* of emergencies. Always wear chemical splash goggles when mixing, spraying or pouring chemicals. Safety glasses alone will not provide complete protection from chemical splashes to the eye.

At LBNL, A portable eyewash unit is always required on the jobsite. In addition, access to a safety shower is required whenever there is a risk of a chemical splash to the body.

The risk of injury to the eyes or skin from chemical contact can be determined by:

- Reviewing the Material Safety Data Sheet (MSDS) for indication that a chemical in use is caustic, toxic, or corrosive.
- Reviewing the MSDS for indication that serious eye damage or skin damage may result.
- Observing warnings on containers such as: "causes chemical burns" or "causes permanent eye damage".

Eyewash units and safety showers must have the following features:

- Pure clean water, either piped in or supplied by a portable unit:
    - Portable units need to be provided with a preservative additive to ensure proper water sanitation. The additive must be changed a minimum of every 6 months. An inspection tag must be provided indicating when the additive was changed (and the unit cleaned).
- Hands free operation
- Constant water flow rate for a full 15 minutes
- Highly visible markings and signs
- Unobstructed access within 10 seconds walking time

All workers on the jobsite must know *in advance* how to properly use an eyewash unit and safety shower:

- Immediately after contact, flood the eye with water or eyewash solution, using fingers to keep the eye open as wide as possible.
- Roll the eyeball as much as possible, to remove any loose particles retained under the eyelids. Do not put anything except water into the eyes to remove particles.
- The eyes should be irrigated for at least *15 minutes*, and the worker transported to a medical facility immediately.

It's easy to forget about eyewash stations or safety showers until they are needed in an emergency.

Don't let *yours* become buried or covered with dust. It could save your sight!

LBNL Construction Safety Briefings

EXCAVATION & TRENCHING SAFETY

Each year excavation and trenching cave-ins result in more than 5,000 serious injuries and 100 deaths in the United States. The key to prevention of this type of loss is good planning. When the side of a trench decides to move it is too late to be thinking about your safety or the safety of others.

At LBNL, all work that will require excavation or drilling requires an LBNL permit. Permits are required whenever excavating or drilling will penetrate 1.5 inches or deeper from a surface.

The follow are required at LBNL when working in or around excavations.

- Evaluation of shoring, sloping, or other means to eliminate the potential for cave-ins must be performed prior to the start of work. The evaluation must be performed by a specially trained person (Competent Person) who is knowledgeable in the areas of soil analysis, the use of protective systems, and in the requirements of applicable standards and regulations.
- Work in an excavation or trench must at all times be under the immediate supervision of a Cal/OSHA excavation Competent Person
- For excavations over 20 feet deep, a Registered Professional Engineer shall design all shoring, sloping, or benching. All designs must be submitted to LBNL Project Manager and filed at the subcontractor's field office prior to the start of work.
- Excavated material must be placed at least 2 feet from the edge of any trench or excavation, which is 4 or more feet in depth.
- Adequate precautions must be taken to ensure that vibrating equipment and vehicular traffic do not cause a cave-in.
- Always consider ground water seepage as a potential cause of collapse of any trench or excavation.
- Safe access/egress must be provided (stairway, ladder, ramp, etc.). The equipment must be securely fastened in place. Access must be provided and located so no worker has to travel more than 25 feet to access the egress point in any trench or excavation deeper than four feet.
- Proper handrails and toe boards shall be erected and maintained at the top of the excavation when required for fall protection.

There are specific standards for the materials used for shoring, and for the angles of slopes used to protect workers. All the protection methods depend on the composition of the soil. Contact your company's excavation Competent Person for more specific information.

If you aren't certain that the shoring, benching, or sloping is adequate, stay out of the excavation. Entering an unprotected excavation or trench may be the last thing you ever do.

LBNL Construction Safety Briefing

EYE INJURY PREVENTION

One thousand eye injuries occur in American workplaces every day. These injuries are responsible for over 3 million dollars spent annually in medical, lost production and workers' compensation costs!!

Why are these injuries occurring?

- 60% of eye injuries occur because the worker was not wearing any eye protection
- About 40% of the injured workers were wearing some type of eye protection, but it was the wrong kind and failed to protect adequately. The leading cause in this category is the lack of side shields.
- Accident studies reveal flying or falling objects and sparks as the cause in 70% of eye injuries. Nearly 60% of the objects causing eye injury are smaller than a pin head.
- Nearly 20% of all eye injuries are caused by contact with chemicals. This includes splashing or chemicals being sprayed directly into the eye.
- 40% of eye injuries occurred among craft workers, such as mechanics, repairers, carpenters, and plumbers. 30% of eye injuries occurred among operatives, such as assemblers, sanders, and grinding machine operators.
- 50% of the injured workers were employed in manufacturing. 20% were employed in construction.

What can we do to prevent these injuries?

1. LBNL requires that as a minimum, safety glasses with side shields are worn 100% of the time on all construction sites.
2. Additional levels of eye protection (chemical splash goggles, face shield, etc.) that may be required will be identified on a task-specific basis through the JHA process.
3. Make sure that the eye protection that has been identified fits properly and is clean. One of the leading reasons for workers removing or not wearing eye protection is the lens became dirty and they could not see what they were doing.
4. Replace any eye protection that has been damaged.

LBNL Construction Safety Briefings

FALL PROTECTION: FALL ARREST SYSTEMS AND FALL RESTRAINT SYSTEMS

To ensure a selected fall protection system will adequately protect you, it is important for you to understand the difference between a fall arrest system and fall restraint system. These two systems provide fall protection in different manners.

FALL RESTRAINT: A fall restraint system is a fall protection system designed to prevent a fall by keeping employees away from a fall point, such as the edge of a roof or the edge of an elevated working surface. These fall points are known as "leading edges". In a fall restrain system, the lanyard and anchorage connection system is limited to a length that will "restrain" a worker from falling off an elevated working surface by physically preventing the worker from reaching the leading edge.

FALL ARREST: A fall arrest system is a system that will arrest (through a controlled stop) an employee who has fallen off a leading edge. It consists of an anchor point, connectors, and a body harness and may also include a lanyard, deceleration device, lifeline, or combinations of these. The entire system must be capable of withstanding the tremendous impact forces involved in *stopping* or arresting the fall. The forces increase with the fall distance due to acceleration (a person without protection will free fall 4 feet in 1/2 second and 16 feet in 1 second!).

Key Points To Remember:

1. Eliminate the leading edge fall hazard by doing as much work as possible on the ground (such as pre-fabricating structures), or by using an aerial lift to attach components that are located near roof edges, etc.
2. Install temporary guard rails or use a warning line system (set back 15 feet from the leading edge).
3. Unless your company is working under an LBNL-approved Fall Protection Program, an LBNL Fall protection Matrix must be completed whenever Fall Protection is required. The Matrix must be developed by an LBNL Fall Protection Competent Person and signed by all workers.
4. All fall protection equipment must be inspected prior to use.
5. Fall arrest anchorage points must be capable of supporting at least 5000 pounds per employee. Fall restraint anchorage points must be capable of supporting at least 3000 pounds per employee.
6. If non-engineered anchorage points cannot be identified by the Competent Person, or a horizontal life line is needed, work shall pause until a Fall Protection Qualified Person can assess the work.
7. All fall protection equipment that has been subjected to a fall must be immediately removed from service, and the Supervisor and Competent Person notified.

TOOLBOX TOPICS

FIRE EXTINGUISHERS

In the event of a fire, the correct use of a portable fire extinguisher could mean the difference between suffering a minor loss or a major one. Portable fire extinguishers, if used properly, can make that difference. But there are several things to consider in using fire extinguishers. For instance, you must know the *class* of fire involved and the correct *type* of fire extinguisher to use.

CLASSES OF FIRES AND FIRE EXTINGUISHERS:

- ***Class A*** Involves ordinary combustibles such as paper, wood, cloth, rubber or plastics. The common extinguishing media is water or dry chemical.
- ***Class B*** Flammable liquids, grease or gases are covered under this category.Common extinguishing media are foam, carbon dioxide or dry chemical.
- ***Class C*** Live electrical fires are class C fires. CO2 or dry chemical extinguishers should be used. However, the actual burning product may be class A items.
- ***Class D*** Burning materials include combustible metals such as magnesium and sodium. Special extinguishing agents, approved by recognized testing laboratories, are needed when working with these metals.

RESPONDING TO FIRES:

Sound the fire alarm and call the local fire department immediately if a fire breaks out. Follow your company's procedures on responding to fires. Only attempt to *fight* the fire if:

1. You know the type of combustible material burning,
2. You have been trained to use the fire extinguisher correctly, and
3. If the fire is still in the incipient (beginning) stage. If the fire gets too large or out of control, evacuate immediately.

REMEMBER P-A-S-S WHEN USING AN EXTINGUISHER:

P - Pull. Pull the locking pin before using the fire extinguisher.

A - Aim. Aim the fire extinguisher at the base of the fire. Not at the flames or smoke.

S - Squeeze. Squeeze the lever of the fire extinguisher to operate and discharge.

S - Sweep. Sweep the fire extinguisher back and forth at the *base* of the fire to extinguish.

(Most extinguishers will only allow about 10-seconds of extinguishing media.)

Prevention is the key when it comes to firefighting. Good housekeeping, proper storage procedures and safe work practices will go a long way toward reducing the likelihood that a fire will destroy valuable property or injure either you or a fellow employee.

LBNL Construction Safety Briefing

HAZARDOUS MATERIALS OR CHEMICALS

At one time or another, you and your co-workers have received training on the "Hazard Communication Standard" alerting you to the chemicals in use on the jobsite. This briefing is to review this information as a reminder of the need to be cautious.

Hazards from chemicals and other materials are everywhere we look, both at work and at home. To help ensure that you are adequately protecting yourself, you need to know what type of hazard a particular chemical or material presents and the controls needed. Hazardous materials or chemicals can be classified into two groups, based upon their characteristics. These two groups are *physical* hazards and *health* hazards. Examples are:

Physical Hazards:

- Corrosive - Corrosives can cause severe skin tissue damage such as deterioration, burns, etc. Examples include *hydrochloric and sulfuric acids.*
- Reactive - Certain chemicals or materials react or change their properties or composition if exposed to other chemicals, products, or just air or water. Reaction can result in hazardous conditions or situations resulting in fire, explosions or the creation of other hazardous by-products. Examples include certain metals such as *sodium or potassium.*
- Flammable - Items that catch fire relatively easy can be considered as flammable. Generally speaking, a flammable product has a flashpoint of 100 degrees Fahrenheit or below. Examples include certain *solvents and fuels.*
- Explosive - This product has the ability to quickly and violently release extraordinary amounts of energy through chemical reaction due to heat, shock or other source. An example of an explosive is *cartridges used in powder actuated tools.*

Health Hazards

- Toxic - Toxic materials or chemicals can cause short-term or long-term sickness or even death. Exposure can be through inhalation, physical contact, etc. The degree of danger is dependent upon the level of exposure. Examples of toxic substances include gases like *hydrogen cyanide and carbon monoxide.*
- Radioactive - Exposure to harmful levels of ionizing radiation can cause adverse health effects. Biological damage to cell tissue can result from overexposure.

When the specific type of chemical or material hazard is identified, proper planning and precautions must be taken to prevent exposure and address emergencies. Precautions may include eliminating the hazard by not using it or by substituting a safer material, providing engineering controls to create physical barriers, or wearing PPE. Emergency planning includes action plans for reporting, containing and disposing of chemical spills.

If you have questions about hazardous chemicals or materials you should review the specific chemical Material Safety Data Sheet (MSDS) and talk with your supervisor. Only when you *identify* hazards can proper precautions be taken to minimize exposure.

LBNL Construction Safety Briefing

HEARING PROTECTION

Noise is unwanted sound that can effect job performance, safety, and your health. Psychological effects of noise include annoyance and disruption of concentration. Physical effects may include loss of hearing, pain, nausea, and interference with communications. Hearing loss occurs gradually (even in intense exposures), so that by the time you notice it, irreversible damage may have already occurred.

LBNL requires the use of hearing protection when noise exposures cannot be controlled at the source. Hearing protection at LBNL is required:

- When measured noise levels in the work area exceed 85 decibels (as measured with a noise level meter).
- Whenever you must raise your voice to be heard at a distance of 3 feet

Training is required for all employees who may be required to wear hearing protection to ensure adequate noise reduction is obtained. Hearing protection must reduce worker exposure to noise to below 85 decibels and signs must be posted in work areas where use of hearing protection is required.

Both earplugs and earmuffs provide physical barriers that reduce inner ear noise levels. However, people often resist wearing them or use them incorrectly. The amount of noise reduction you obtain depends on obtaining and maintaining a good seal. Even a small "leak" can substantially reduce the effectiveness of the hearing protector. Remember to check the seal several times each day. Hearing protectors, especially ear plugs, have a tendency to work loose as a result of talking or chewing, and must be resealed occasionally.

It is important to notify your Supervisor immediately if:

- You experience a roaring sound, or ringing in your ears at the end of the workday.
- Normal sounds of speech or music are muffled after you leave work, but return to normal after a while.

Most of us take our sense of hearing for granted. We assume that *we* hear what everyone *else* hears. Loss of hearing may not be realized until a friend or spouse screams in frustration, "Why don't you ever *listen* to me!!"

Our ability to hear is precious and must be protected.

LBNL Construction Safety Briefing

HEAT ILLNESS PREVENTION

Working in hot conditions can result in heat-related illness unless precautions are taken. When the outside temperature exceeds 85 degrees, or when working conditions create an additional heat load on the body (asphalt paving, roofing, work in areas with limited ventilation, use of full body PPE, etc.) a sensible plan for providing shade, water and a reasonable number of rest breaks can prevent serious illnesses and even death.

Symptoms:

The symptoms of heat illness can be slow to start, but increase in intensity if precautions are not taken. The initial onset of symptoms usually involve headaches, thirst, and tiredness, but can quickly advance when the body's natural cooling system breaks down and causes the body core temperature to rise and overheat the brain. Some of the symptoms of this condition are immense thirst, severe headaches, disorientation, dry/hot skin (no sweating) and fainting.

Prevention:

1. Access to shade (from tents, canopies, trees, walls, etc.) must be provided when the outdoor temperature in the work area exceeds 85 degrees Fahrenheit. Shade must also be provided when the outside temperature does not exceed 85 degrees, but when the working conditions create an additional heat load on the body or when employees request it.
2. Employees must have access to drinking water. If drinking water is not plumbed or otherwise continuously supplied, it must be provided in sufficient quantity to provide one quart per employee per hour (2 gallons per employee for an 8 hour shift).
3. High-heat procedures must be followed when the outdoor temperature in the work area exceeds 95 degrees. These include observing employees for symptoms of heal illness, reminding employees to drink plenty of water throughout the work shift, ensuring employees can communicate with Supervisors (voice, cell phone, etc.), and closely monitoring new employees until they are accustomed to working in the heat (first 14 days).

Treatment:

If an employee appears to be suffering from heat illness, remove him or her from the heat and provide a cool, shaded place to rest. If the employee is disoriented or non-responsive, call for medical attention immediately.

The goal is to recognize the hazards and symptoms of heat illness and stop them before they occur. Remember, there is no better cure than prevention, and heat stress disorders can occur in winter as well as summer.

LBNL Construction Safety Briefing

HOUSEKEEPING

Jobsite housekeeping is a very important part of every worker's job. Not only does it improve the overall appearance of the work area, it shows that you take pride in where you work. The best way that you can help keep your work place clean is to pick up after yourself! Don't leave it for the next shift or another craft to worry about.

Here are some reasons to keep your work area clean:

1. It is the expectation of LBNL's senior project management.
2. Subcontractors are solely responsible for the cleanup of their immediate work areas on a daily basis
3. Trip and fall hazards are reduced or eliminated.
4. Production is increased. You won't have to waste time looking for a misplaced tool.
5. If someone falls because of materials you left on the floor, you will feel guilty because you were a causal factor in the accident. Also, the injured worker may want to remind you of that!
6. You reduce a potential fire hazard by removing unneeded combustibles from the work area.

Here are some tips to helping you maintain a clean work area:

- Plan the job. Make a list of the needed tools/materials. This will help to minimize unnecessary clutter around your work area.
- Develop a routine for cleaning up at the end of the shift or periodically during the shift.
- Do not allow employees to eat or drink in the work area, not only because of litter problems, but also because of hygiene concerns.
- Appropriate containers must be provided for the collection and separation of waste, trash, oily and used rags, and other refuse.
- All dumpsters in use must have unobstructed access. Containers shall be disposed of daily.

The point of this briefing is to take remind each worker to take responsibility for themselves and their work area! Remember, a clean work area is a productive work area and also enhances safety!

LBNL Construction Safety Briefing

LADDER SAFETY

Ladders are an integral part of construction activities and are used by many workers on a daily basis. However, ladder use at LBNL continues to be the cause of safety deficiencies and injuries.

The following are ladder use requirements to help make your interaction with ladders less hazardous:

- All ladders brought onto the job site must meet all ANSI, OSHA, and Cal/OSHA requirements. Only "Type 1" Heavy-Duty ladders are allowed at LBNL.
- Ladders shall be inspected daily by the subcontractor's Competent Person. Defective ladders shall immediately be withdrawn from service and tagged to prevent use, or destroyed.
- When using extension ladders, abide by the 1:4 rule. This means if you are using a 12 foot ladder, the base should be three feet from the structure.
- Ladders shall not be used in a horizontal position as platforms, runways or scaffolds.
- Extension ladders and side rails shall extend at least 36 inches above the landing and be secured at this point.
- When working from step ladders above 6 feet, employees must maintain 3 points of contact or be provided with fall protection (or work from platform ladders).
- When setting up a ladder, make sure the ground it is set upon is level and stable. Do not set the ladder up on a muddy surface or you may find yourself falling over. Do not use bricks or other material to raise the height of the ladder. If it is not tall enough, you are using the wrong ladder.
- When using a stepladder, make sure the folding cross braces are locked in the proper position before you step onto it.
- Always face the ladder when ascending or descending, and have both hands free to grasp it securely. If you need tools, they should be carried in a tool belt or pulled up with a rope once you have reached your destination.
- Keep your body between the side rails of the ladder. This reduces the chance of tipping it over and/or falling off.
- Do not climb higher than the third rung from the top on straight or extension ladders or the second tread from the top on stepladders.

By following the above rules, you greatly reduce your chances of being injured while working on ladders. Remember, the life you save will be your own!

LBNL Construction Safety Briefings

LOCKOUT/TAGOUT (LOTO)

LOTO is performed to prevent a worker from being injured by the accidental release of energy. LOTO applies to all energy sources including mechanical, thermal, pressure, chemical, and rotational, not just electrical. If a worker is to perform task in which he or she could be injured by the start up of equipment or by the introduction of electrical power or any other energy source, the equipment or source of power must be de-energized and isolated before work begins. All workers who are working on that equipment are required to have control over the energy with a personal lock and tag.

At LBNL, each LOTO of equipment, utilities, systems, etc., requires an LBNL-issued LOTO Permit. This is true when the subcontractor is working independently, and when LBNL employees are assisting with the LOTO.

Permit: No subcontractor employee shall apply a lock or tag to any circuit or equipment without first obtaining an LBNL-approved LOTO permit. You can obtain a LOTO permit online at http://electricalsafety.lbl.gov. Do not de-energize equipment or work on de-energized equipment without a LOTO permit.

Subcontractors must follow all safety requirements found in PUB-3000, Chapter 18, Section 18.19.6, Appendix 6: "Subcontractors and Vendors: What You Need to Know About Performing Electrical Work and Lockout/Tagout at Lawrence Berkeley National Laboratory".

The following is a review of the *basic* steps for safely de-energizing equipment and for restoring equipment to service:

1. Notify all "affected employees" that the equipment will be shut down.
2. Shut down the equipment by normal stopping procedures.
3. "Isolate" all the equipment's energy sources.
4. Lock out and tagout the energy isolating devices with assigned, individual locks.
5. Release or restrain any *stored* energy by grounding, blocking, bleeding down, etc.
6. Assure that no workers are exposed, then *test* the equipment to assure that it will not operate.

Restoring Equipment to Service:

1. Check to Assure that all employees have been safely positioned or removed from the area.
2. Verify that equipment controls are in neutral.
3. Remove lockout devices and/or tags and re-energize the machine or equipment.
4. Notify affected employees that servicing is complete and the equipment is ready for use.

According to the latest statistics, every ten minutes, two people are killed and hundreds suffer disabling injuries from accidents on the job. DON'T BE A STATISTIC! Know what part you play in the Lockout/Tagout Program.

LBNL Construction Safety Briefing

PORTABLE LIGHT STRINGS

Follow these precautions when using portable light strings:

- Inspect the wiring and fixtures before stringing the lights or before they are energized or plugged in. Make sure the outer insulation is not damaged, the plug ends are intact, and the fixtures are not cracked.
- The light string must be grounded. Make certain the plug has a ground prong. Never cut one off. A good ground could save your life if an electrical fault develops, especially when working in wet conditions or on metal structures. LBNL requires that all portable light strings be plugged into a Ground Fault Interrupter (GFI) protected circuit.
- For outdoor use, only use outdoor rated light strings. The cord must be stamped with a "W" to indicate that the light string is rated for outdoor use.
- Never string lights so they are near any combustible items. You know from experience, that bulbs get hot. Even if they are not in direct contact with the combustible, heat can build up slowly until the ignition temperature is reached.
- Make certain that all bulbs have guards installed. Not only will this help prevent the bulb from coming in direct contact with a combustible, it can also protect you (or someone else) from coming in contact with the bulb and getting burned.
- All fixtures must have an unbroken bulb installed. The bulb will help prevent you from coming in contact with the exposed electrical conductors that are present when a bulb is missing or broken. When you change a broken bulb, disconnect the power from the light-string and wear gloves to guard against cuts.
- Do not suspend or support portable light strings by their cords. Only use the suspension points that are built into the assembly.
- Never use a light string as an extension cord.

Never use an ordinary light string in an area that could contain flammable vapors. When used within an enclosed or confined space, the space must be certified as "Safe for Hot Work" if a conventional string is used. If the atmosphere is not "Safe for Hot Work", then "explosion-proof" lights must be used. Keep in mind, when you place any type of lighting in an area where flammable vapors are present, you are introducing a source of ignition. *This could endanger your life*.

You will want to be especially careful during your inspection to make sure that the cord, all plugs, the fixture and the globe are all in place. Don't forget the gasket at the bottom of the globe. Make sure everything is clean and tight.

LBNL Construction Safety Briefing

PREVENTING ELECTRICAL SHOCKS

Preventing electrical shocks both at home and at the jobsite requires awareness of the hazards and a respect for this "Silent Killer." The human body has a low resistance to electricity, making it a good conductor, like most metals. Unlike metals however, the human body does *not* respond well when electricity passes through it. Physical results include thermal burns, disruption of normal heart activity, severe muscle contractions, and even death.

The most common and serious electrical injuries occur when electrical current flows between the hands and feet. This happens when a person touches an energized line. The electrical energy passes through the body to the feet to reach ground. When this occurs, a person's heart and lungs are frequently damaged by the electrical energy.

At LBNL, all subcontractors are required to have a system in place for routine testing and maintenance of electrical tools, equipment and extension cords (equipment). Damaged equipment shall be removed from the jobsite. In addition, all electrical equipment on the jobsite shall bear the label of a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories (UL), CSA, or ETL.

Precautions for avoiding electrical shocks include the following:

- All 120-volt, single-phase, 15, 20, and 30 ampere receptacles shall be protected by approved GFCIs. Other receptacles shall be protected by an approved GFCI, or through an LBNL-approved written "Assured Equipment Grounding Conductor" program.
- Always make sure electric tools are properly grounded or double insulated. The double insulated tool must have an undamaged outer case and be clearly labeled as "double insulated" by the manufacturer.
- Use heavy duty grounded extension cords. These cords have two layers of insulation, with reinforcement between the layers. They are less susceptible to damage than house-hold type cords. To check if the cord is heavy duty, check its shape. Most *flat* cords are not heavy duty. Heavy duty cords will have a marking on the insulation such as: "S", "ST", "SO", and "STO".
- Avoid mixing water and electricity! Not only keep cords, tools and working/walking surfaces dry, but keep your hands and feet dry as well. The electrical resistance of wet skin is at least 100 times less than dry skin. Wet skin greatly increases the likelihood of severe shock if a person comes in contact with a live circuit.
- Safe clearance distances must be maintained from overhead electrical lines. It is the responsibility of the subcontractor performing the work to ensure overhead electrical lines are de-energized, blanketed, or protected against accidental contact by other means.
- Never work on or around a live electrical circuit. *Lock Out* the power following LBNL LOTO requirements so that *only you* have control over energizing the machine or equipment. Don't take chances.

Remember, electricity strikes without warning-always play it safe!

LBNL Construction Safety Briefing

PROTECTIVE HEADWEAR

One serious blow to the head can leave an otherwise strong and healthy person permanently brain-damaged or disabled for life. At best, a blow on the head can give you a whopper of a headache. Therefore, it is crucial to protect it from the impact of falling objects, painful bumps and in some cases, from high-voltage electric shock. At LBNL, ANSI approved head protection is required 100% while on construction sites, and in non-construction areas when there is a potential for head injury from falling or moving objects or exposure to electricity.

Hard Hats: The American National Standards Institute has established guidelines for hard hats, the latest of which is ANSI Z89.1-1986. The standard requires that the manufacturer's name must be listed inside the helmet, and it must have one of the following ANSI designations:

- Class A: These protect the head from the impact of falling objects and from electric shock during contact with exposed *low voltage* conductors.
- Class B: These have the same function as class A except that they prevent electric shock when exposed to *high voltage* conductors.
- Class C: These protect the head from falling objects, but offer no electrical protection.

Hard hats primarily protect from impacts to the top of the head, limit penetration of sharp objects which hit the top of the shell, and provide some lateral (side impact) protection. To be effective however, hard hats must be properly worn. Some workers wear their hard hats backwards, which lessens the protection. If it is worn tilted back on the head, it offers virtually no protection at all.

Hard Hat Care:

- Inspect hard hats daily for cracks, signs of wear and deterioration to ensure that they provide the amount of protection originally intended.
    - Hard hats that exhibit chalking, cracking, or lose all their surface gloss should be discarded.
- If hard hats must be marked for identification, use adhesive decals or tape. They should not be painted, cut or engraved.
- Do not keep hard hats on the window shelf of a vehicle since extreme heat can affect the degree of protection. The hard hat can also become a projectile in the event of a vehicle accident.
- Replace internal suspension systems once a year or if the system detaches from the shell. Hair oils and dirt can weaken the shock-absorbing suspension system.
- At least every 30 days, hard hats and their sweatbands and cradles should be washed in warm, soapy water and rinsed thoroughly.

LBNL Construction Safety Briefing

RESPIRATORY PROTECTION

LBNL requires use of respiratory protection on jobsites whenever air contaminants may be created to a level above regulatory limits. The respiratory protection used by workers must be designed to protect against the particular substance encountered. An LBNL-reviewed respiratory protection program and supporting documentation is required from subcontractors before work begins.

In determining if a respiratory protection program is needed, it is necessary for the subcontractor to evaluate the level of contaminants in the air and/or the work processes involved, such as spray painting, concrete cutting, abrasive blasting, etc. If air contaminant levels may exceed regulatory limits, the first step is to evaluate and implement suitable engineering controls (such as using wet methods or HEPA exhaust filtration) to lower the level of contaminants. Then, if a potential exposure continues to exist, carefully select the appropriate level of respiratory protection and implement a respiratory protection program.

The subcontractor's respiratory protection program will include the following elements:

- Physician's examination to determine the worker's capability of wearing a respirator.
- Written standard operating procedures for the selection and use of respirators.
- Fit testing documentation for the specific respirator used.
- Use of respirators and filters for each atmospheric need.
- Requirements for cleaning and proper storage of respirators.
- Documented employee training on respirator use and limitations.
- Work-area monitoring to establish degree of exposure and type of respirator needed.

A competent person must continually monitor the worksite, and evaluate the need for a respirator program whenever exposures change. New exposures could be created due to different chemical uses, changes in work methods and processes, or whenever chemical spills occur. Additional employee training may also be necessary at this time.

Respirators are an important safety and health protection, when used properly. Learn to select, use and maintain them--and keep the air you breath free of harmful contaminants.

LBNL Construction Safety Briefing

SILICA DUST

Crystalline silica is a common mineral in the earth's crust, and is found in many types of rock including sand, quartz, and granite. Silica is present in both work and non-work environments, and exposure to crystalline silica dust has long been known to cause a disease called silicosis. When you inhale crystalline silica the lung tissue reacts by developing fibrous tissue around trapped silica particles. This condition of the lung is called *silicosis*.

Due to the extensive use of concrete and masonry products in buildings today, construction workers have a potential exposure to crystalline silica. Operations such as dumping of rock, jack hammering, abrasive blasting, sawing, drilling or demolition of concrete and masonry structures are some of the activities that could produce this exposure.

Silica sand or other substances containing more than 1% crystalline silica should never be used as abrasive blasting materials. Where silica exceeds 1% of the content, less hazardous materials should be substituted.

Always follow safe work practices when there is possible exposure to silica dust:

- Keep awareness high, which is the key to preventing silicosis. Recognize when silica dust may be generated and plan ahead to eliminate or control the dust at the source.
- Use proper respiratory protection when engineering controls (wet methods, HEPA exhaust filtration, etc.) cannot keep exposures below regulatory limits.
- Use dust control systems when they are available and keep them well maintained.
- Be aware that high silica concentrations can occur inside *and* outside enclosed areas during operations such as concrete or masonry sawing or abrasive blasting.
- Do not eat, drink, or smoke in areas where sandblasting is being done, or where silica dust is being generated.
- Wear disposable or washable over-garments at the work site. Wash your hands and face before eating, drinking, or smoking and HEPA vacuum (don't blow) dust from your clothing. Shower if possible and change into clean clothes before leaving the job site to prevent contamination of cars, homes, and other work areas.

Your lungs can take care of normal dust. Airborne dust and dirt is common at worksites, both at home and on the job. Fortunately, the body's respiratory system does a good of job filtering out dust and most foreign bodies. Fine particulates such as asbestos and silica however, are so tiny they can get past our filtering system. This may cause serious lung problems over an extended period of time if protection or controls are not used. Respect these tiny invaders. Use the appropriate personal protective equipment and safety precautions.

TOOLBOX TOPICS

WELDING & CUTTING SAFETY

Protecting yourself when performing welding operations depends on your understanding of the hazards involved and the proper way to control them. Control of welding hazards includes avoiding eye injury, respiratory protection, ventilation of the work area, protective clothing and having safe equipment to use.

Eye hazards include exposure to ultraviolet and infrared light. Welders and their helpers must wear filter glasses to protect their eyes. LBNL requires shade 7, 8, 9 or higher, depending on the type of welding being done. When other workers on the jobsite may be exposed to the welding arc, the welding task must be shielded by a welding blanket, screen, etc.

Virtually all welding processes generate gases, fume and dusts. Gases generated include carbon monoxide, carbon dioxide, ozone, and nitrous gases. Other gases may also be formed in the presence of chemicals which may be on the material being welded. Welding and cutting can generate fumes from cadmium, lead, cyanide, beryllium, arsenic, fluorides, nickel, cyanide, and other materials which can be hazardous if inhaled. Proper respiratory protection should always be worn when cutting or welding. The best type of protection to use can be determined by reading the Material Safety Data Sheet for the material being welded, or the manufacturer of the rod or flux being used.

Safety precautions and requirements include:

- All welding equipment should be inspected each day prior to use. Report any defects found in regulators, torches or electrical components to a person that is qualified to make the necessary repairs.
- Proper gloves must be worn to protect against welding heat sparks and slag.
- Outer clothing must be free from oil or grease and made of fire-resistant material. Sleeves and pockets shall be kept buttoned.
- High top shoes and fire-resistant leggings or high boots shall be worn.
- An LBNL "HOT WORK PERMIT" is required.
- A portable “multipurpose” ABC fire extinguisher, minimum 20lb, shall be kept close at hand at all times.
- A fire watch must be maintained during the hot work task and for 30 minutes after all burning or welding operations.
- Acetylene shall never be used at a pressure of more than 15 pounds per square inch.
- All torches used shall be of the type with built in anti-reverse flow valves.
- Oxygen and acetylene bottles in storage must be separated by a 1 hour fire-rated barrier, or be physically separated by 30 feet.
- The electrode holder and connecting cable shall be fully insulated. Light holders shall not be used for heavy work, and welders shall avoid standing on damp or wet surfaces while welding.
- Cables shall be kept dry and free from oil and grease and arranged in such a manner that they do not lie in water, oil, or ditches, or on bottoms of tanks.
- Electric stubs shall be placed in containers provided by the subcontractor for this purpose.

Appendix C – Pre-Construction Meeting Agenda

Ernest Orlando Lawrence
Berkeley National Laboratory
Berkeley, CA 94720
Facilities: Capital Projects

Date: {DATE}

TO: Distribution

FROM: {NAME}
Project Manager

SUBJECT: {PROJECT NAME}
SUBCONTRACT# {XXX}
Construction Pre-Start Meeting Agenda
{LOCATION}

Attendees:

Subcontractor
•

LBNL
- Safety Inspector:
- Construction Inspector:
- Construction Manager:
- Project Administrator:
- Project Manager:
- Subcontract Administrator:
- Environmental Planner:
- Environmental Services Group Manager:

Items in Bold must be completed prior to starting construction.

Environment, Health and Safety:

1) Safety is the first priority. Everyone at the Lab has a right to stop the work if something doesn't look safe.
2) **Construction may not start until contractor's Safety Program and Project Safety Plan has been reviewed and approved.**
3) Refer to LBNL PUB-3000 Health and Safety Manual, on the web at www.lbl.gov/ehs/pub3000/.
4) Safety Program requirements may include but are not limited to:
   - Confined Space Entry
   - Emergency Response/First Aid
   - Fire Protection and Prevention
   - Hazard Communications
   - Hazardous Waste Operations
   - Contaminated Soil/Groundwater Response Plan
   - Spills
   - Industrial Hygiene
   - Inspection, Maintenance and Certification of equipment

- Lock Out/Tag Out
- Medical Monitoring
- Personal Protection Equipment
- Project Posting, Access Control, Signs, Barricades
- Radiation Protection
- Fall Protection
- Trenching/Excavation Shoring
- Ladders
- Scaffolding
- Welding/Cutting
- Electrical
- Housekeeping

5) **Project Safety Plan shall include proposals for implementing the required Safety Programs by:**

   Identifying personnel responsible for safety on the work site

   Including task specific hazards analysis process for each phase of work, that:

   - Identifies hazards and measures to control them.
   - Includes drawings/documentation of measures.
   - Lists equipment to be used and operation/inspection requirements.
   - Identifies specific inspections required.
   - Identifies specific training required.

   Including a detailed outline of proposed employee site safety orientation.

   Subsequent revisions submitted prior to commencement of affected work.

   Additional hazard analysis of high-risk operations may be required at any time during the project.

6) Certified Safety Professional to administer contractor's Safety Program and Project Safety Plan. An on-site Safety Representative is required when Safety Professional is not on site. For Safety Professional, submit credentials, resume, evidence of CPR/First Aid qualifications and supervisor HAZWOPER training. For on-site Safety Representative, submit evidence of 10-hour OSHA safety construction class.

7) All hazards to be identified analyzed and mitigated. See Hazards Analysis Form. Safety Professional shall conduct analysis for each phase of the work, updated as required and not less than every two weeks.

8) **Safety Representative to conduct daily inspections of equipment, material and operations. Document inspections and any corrective actions in Daily Inspection Reports. Keep reports available at the site for review by LBNL.**

9) **LBNL Safety Inspector will monitor contractor operations and compliance with safety codes, standards, regulations and the contractor's submitted safety plan. Any safety deficiencies will be reported in Safety Deficiency Notice and contractor shall submit a Corrective Action Memorandum within 24 hours.**

10) Special Training Requirements: {list, if applicable}

11) Report any and all accidents, injuries or occupational illnesses to LBNL PM.

12) If an accident occurs, access to the area shall be restricted and the LBNL PM shall be contacted immediately. The area shall remain undisturbed until released by the University. The contractor's Safety Professional shall provide accident investigation and follow up support per Lab Safety Analysis and Review protocol.

13) LBNL emergency telephone number (x7911) is valid for in-house calls only, from cell or an outside phone, the emergency number is (510) 486-6015. Contractor can contact LBNL EMT's or contact the outside paramedics.

14) LBNL Medical Department is located in Building 26.

15) Need to conduct work site safety orientation for each employee and maintain signed and dated roster.

16) Conduct “Tool Box” safety training meetings.

17) Maintain safety training records.

18) All construction workers should have required personal safety equipment.

19) Need a first aid kit at jobsite.

20) Keep Cal and Fed OSHA codes at the jobsite.

21) Identify location of OSHA poster.

22) MSDS sheets shall be available on site.

23) LBNL’s substance abuse policy applies to contractor and subcontractors.

24) Post for hard hat area.

25) Lock Out/Tag Out (LOTO):

- If LOTO needs to be applied to existing live utilities or services, LBNL must be notified, to apply an administrative lock, before contractor applies their LOTO.
- Display the locks and tags that the sub will be using. Verify that the sub uses a singular format and has no other lock & tag formats on site (e.g., in the trucks). Verify that the sub's locks only have one key each.
- Display the locks and tags that LBNL will be using, including administrative locks, as applicable. The subs and the on-site employees must all know what everyone will be using.
- Review the LOTO procedures as applicable to the project. Emphasize the protocols between Lab employees and subcontractor employees. Discuss the difference between subcontractor LOTO and LBNL administrative locking.
- Review the requirements for verification of zero energy state. Applies to all energy sources. Emphasize that testing electricity in LOTO = hot work! Discuss qualification / authorization requirements for this, and WHO is authorized.

26) Electrical:

- Discuss the general prohibition on hot work - includes just being within 3.5' of an exposed live part.
- Discuss PPE requirements for electrical work, including inspection of electrical Personal Protective Equipment (PPE) and a review of PPE use, storage, and inspection requirements.
- Gloves:
  a. Must be < 6 months since test date.
  b. Must be stored flat, unfolded, in protective canvas holder.
  c. Must be inspected every day of use - inflate / check for leaks; carefully inspect for wear or deterioration.
  d. Must use leather protectors over rubber. Rubber cuffs must be visible a few inches beyond the leather cuffs.
- No gloves allowed on site that do not meet these requirements, even if not being used. Check trucks.
- Discuss permit requirements for electrical work.
- Discuss tool requirements. Tools that will be on or near electrical live parts shall be specifically marked with rated voltage. Regular rubber grips are not rated.
- Inspect all electrically rated tools, as appropriate, and review tool use, storage, and inspection requirements.

- Discuss testing and troubleshooting requirements. NFPA 70E shock boundaries: Limited, Restricted, Prohibited. Arc flash boundaries.

27) Cal and Fed OSHA enforced.

28) Discuss environmental permit required actions and NEPA/CEQA mitigation measures. ***{NOTE: Invite Jeff Philliber and Ron Pauer to pre-start meetings to discuss.}***

Schedule:

29) Work includes Base Bid only.

30) Notice-to-proceed date to be confirmed. Construction period is XXX calendar days. Normal construction operation hours are 7:30 a.m. to 6:00 p.m. Monday through Friday, except Holidays. Contractor may need to schedule some work on nights or weekends due to shutdowns not able to occur during work hours.

31) Liquidated Damages are $XX per day.

32) **Submit a 45-day Preliminary Construction Progress Schedule within 10 days from the date of the Notice to Proceed.**

33) **Submit a CPM schedule within 30 days from the date of the Notice to Proceed.**

34) Submit two-week look-ahead schedules during the weekly meetings.

35) Refer to specification for shutdown procedures. Need 2 week notice for shutdowns, to review and approve and 72 hours notice prior to actual shutdown.

Inspection Issues:

36) All work shall be in conformance with the drawings and specifications. Contractor responsible for Quality Control, LBNL Inspector will verify conformance.

37) Status of the redlined as-built drawings will be reviewed weekly by Inspector.

38) Inspector needs to review progress payment for percent of completion. Inspector will recommend payment on approved work only. No credit will be given for undocumented contract changes.

39) Dig permits need 72-hour notice. Penetration of ground or building surfaces require dig permits. Burn permits need 24-notice, call (510) 486-6015, to be coordinated by the LBNL Construction Manager.

40) Need to document installed underground utilities before backfilling. Survey of utilities.

41) All work must be inspected by LBNL Inspector prior to concealing it or making inaccessible. Contractor to contact Inspector directly for inspections.

42) Testing log will be distributed by LBNL Project Manager.

Construction Issues:

43) Special requirements for dust and vibration control for work on XXX are indicated in Specification Section 01210-Special Requirements and 01735-Selective Demolition.

44) Weekly progress meetings to review Safety, Schedule, Inspections, Permits, RFI's, Submittals, Testing/Acceptance, Change Orders.

45) Laydown is XXX.

46) Parking is limited. Carpool whenever possible. Company vehicles in truck dock area for loading only. {Subcontract Administrator or Project Administrator} to arrange for contractor personnel gate passes and parking spaces, if available. Deliveries should be scheduled during non-commute hours. Large, slow trucks require LBNL security escort.

47) Construction trucks must use approved truck routes; the City of Berkeley requests truck routing be directed toward University Avenue, Oxford between Hearst and University, Hearst east of

Shattuck, Shattuck, Adeline and Ashby Avenue; avoid the Warring/Derby/Belrose/Claremont corridor.

48) Utility/access shutdowns to be coordinated through Construction Manager and Building Manager.

49) Site traffic interruptions to be coordinated through Construction Manager.

50) Implement Construction Waste Minimization plan, Specification Section 01570.

51) Coordinate work with on-going projects/events.

Submittals/RFI's/Change Orders:

52) All Project Documentation to be forwarded to Project Manager. Submittals can be sent concurrently to A/E.

53) Project Administrator will handle distribution of documentation.

54) Submit a List of Materials and Equipment (Submittal List) to be incorporated into project.

55) Submittals requiring lateral force resistance calculations should use criteria in Specification Section 01900-Lateral Force Anchorage Provisions.

As-Builts:

56) As-built drawings need to be kept at contractor trailer updated weekly and checked prior to progress payment being made.

Subcontract Procurement

57) Davis-Bacon Requirements.

58) Payroll records and statements of compliance.

59) Posting of Wage Determination.

60) Notice of Subcontracts.

61) Compliance checks.

62) **Submit cost breakdown to Subcontract Administrator within 10 days from the date of the Notice to Proceed.**

63) **Submit List of Subcontractors, including Minority Subcontractor Listing, within 10 days from date of the Notice to Proceed.**

Scope of Work:

64) Base Bid.

Distribution: ("X" indicates attendees)

							File

Appendix D – Construction Safety Checklist

LBNL Construction Safety Check List

Safety Check List MUST be posted at the job-site.

Sub-Contractor shall take all reasonable precautions in the performance of the work under this purchase order to protect safety and health of employees and members of the public and shall comply with all applicable environmental, safety, and health regulations and requirements (including reporting requirements of the University and DOE). In the event Sub-Contractor fails to comply with these regulations or requirements, the University may issue an order stopping all or any part of the work; thereafter, a start order for resumption of work may be issued at the discretion of the University. Sub-Contractor shall make no claim for extension of time or for compensation or damages by reason of or in connection with such work stoppage.

Sub-Contractor shall fill out the attached Safety Check List (SCL) and submit to Lawrence Berkeley National Laboratory (LBNL) Project Manager for review and final approval the LBNL Construction Safety Engineer must reviewed and sign prior to start of construction. This SCL consists of Environmental Protection and Health and Safety items that are most required of subcontractors and their lower-level subcontractors when performing work at LBNL. These items and all other requirements in the contractual documents will be enforced.

To expedite the review/approval, submit all JHA/Training Records/MSDSs with the SCL; Approval will not be complete without the additional information required.

DATE:	DATE Received By EH&S:		
Sub-Contractors Company Name:			
Project Title:			
Sub-Contractors Superintendent:			
Phone No:		Fax No:	
Building Location:		PO No:	
Detailed Description of Work:			
LBNL Requester:		Phone:	
LBNL Buyer:		Phone:	

Safety Policy

General

Lawrence Berkeley National Laboratory (LBNL) is committed to providing and maintaining the safest possible work conditions for all workers by promoting the integration of safety management into all construction processes.

Project managers, construction managers, superintendents, assistant/area superintendents, safety representatives, and foremen are responsible for implementing and maintaining an effective safety program. It is the responsibility of these individuals to ensure workers under their supervision maintain safe work areas and perform their tasks in a safe manner. It is also the responsibility of each worker to follow every precaution and LBNL safety rule and policy to protect themselves and their fellow workers. LBNL will monitor safety programs and performance to ensure compliance with LBNL requirements. When performing work at LBNL, each employer:

- Is responsible for the safety of their employees and/or visitors as required by the rules and regulations of this chapter; 10 CFR 851 “Worker Safety & Health Program”; the California Code of Regulations, Title 8, Construction Safety Orders; 29 CFR 1926 Safety Standards for the Construction Industry; and all other local, state, and federally recognized current standards and codes.
- Is required to understand and follow the contents of PUB 3000, LBNL Health and Safety Plan.
- Is responsible for training and educating their employees, and/or visitors, as to the contents of this chapter and requirements for conduct of work under the LBNL Integrated Safety Management (ISM) Plan. (Documentation of all training is the responsibility of the subcontractor.)
- Differences of opinion regarding a stop work order between the LBNL Project Manager, LBNL Construction Safety Engineer, and others involved must be immediately referred to their respective functional supervisors for resolution. The recommendations of the LBNL Construction Safety Engineer must be followed until a final decision is made. Final determination will come from the LBNL Facilities Division Director.

This policy applies to all construction activities performed by LBNL employees; contract employees under the direct technical supervision of an LBNL employee, referred to as "contract employees”; and non-laboratory employees under the supervision of subcontractors, referred to as "construction subcontractors." Construction activities may originate from construction subcontracts, service contracts, purchase orders, and in-house work orders.

Department of Energy 10 CFR 851, "Worker Safety & Health Program”

All work shall comply with the Department of Energy’s Worker Safety and Health Program regulation, 10 CFR 851, which enforces worker safety and health requirements including but not limited to standards of the Occupational Safety and Health Administration (OSHA) as incorporated in the LBNL Worker Safety and Health Program. Violations of safety and health provisions of 10 CFR 851 may subject to penalties. The employer shall follow the provisions of its Cal/OSHA mandated Injury and Illness Prevention Plan (IIPP) and submit it to LBNL when requested. The employer shall also follow all LBNL safety procedures and policies communicated in it.

A. Mandatory Requirements on All Construction Projects

Competent Person

Provide a written list of those persons onsite who are capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them. The Employer shall ensure that each competent person listed has been trained in the following areas as applicable: Competent Person:_____

Qualified Person

Provide a written list of those persons onsite who by possession of a recognized degree, certification, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work, or the project. The Employer shall ensure that each qualified person listed has been trained in the following areas as applicable: Qualified Person:_____

Asbestos: Competent Person: _____

Cranes: Competent Person: _____

Confined Space: Competent Person: _____

Demolition: Competent Person: _____

Electrical: Qualified Person: _____

Excavations: Competent Person: _____

Fall Protection: Competent Person: _____

Ladder: Competent Person: _____

Scaffold: Competent Person: _____

Steel Erection: Competent Person: _____

Underground Construction: Competent Person: _____

Project Specific Construction Safety Checklist

1. Personal Protective Equipment

Monitory on all LBNL Projects: Safety Glasses, Hard Hats and Work boots 100% of the time while working on any LBNL construction and or Facility maintenance projects.

Will the work involve hazards that require the use of any of the protective equipment listed below?	YES ☐	NO ☐
Full Face Shields,	YES ☐	NO ☐
Chemical Splash Goggles	YES ☐	NO ☐
Welders Hood and Goggles, Leathers Gloves	YES ☐	NO ☐
Steel Toed Boots,	YES ☐	NO ☐
Work Gloves, leather, rubber…	YES ☐	NO ☐
Ear plugs Or Ear Muffs,	YES ☐	NO ☐
Fall Protection, is required anytime the worker is above 6 feet. ***ANSE/ASSE Z359 to be followed. Submit for PPE***:		
Fall Protection Plan	YES ☐	NO ☐
Training Records	YES ☐	NO ☐
Electrical PPE,		
Head protection (ANSI Z89.1, 1997)	YES ☐	NO ☐
Eye & Face (ANSI Z87.1, 1998) Class	YES ☐	NO ☐
Rubber-Insulating Gloves (ASTM D120-02, 2002) _____	YES ☐	NO ☐
Rubber-Insulating Sleeves (ASTM D 1051-02, 2002) _____	YES ☐	NO ☐
Leather Protectors (ASTM F 696-02, 2002)	YES ☐	NO ☐
Dielectric Footwear (ASTM F 1117-98, 1998) Level	YES ☐	NO ☐
Flame Resistant (FR) Clothing (ASTM F 1506-02a) _____	YES ☐	NO ☐
FR Face Protection Products (ASTM F 2178-02) _____	YES ☐	NO ☐
FR Outerwear (Raingear, etc) (ASTM F 1891-02a) _____	YES ☐	NO ☐
Respirators,		
Contractor must submit the following items for Respirator Use :		
Respiratory Protection Plan:	YES ☐	NO ☐
Medical Release:	YES ☐	NO ☐
Quantitative Fit Test Records:	YES ☐	NO ☐
Qualitative Fit Test Records:	YES ☐	NO ☐
Training Records:	YES ☐	NO ☐

2. Hand and Power Tools

Will the work involve the use of electrically powered tools?	YES ☐	NO ☐
Will the work performed on this project involve the use of **powder actuated tools**?	YES ☐	NO ☐
Contractor must submit the following items for Powder Actuated tools: Training Records: On File with EH&S: YES ☐ NO ☐	YES ☐	NO ☐

3. Ground & Surfaces and Penetration

Will the work scope require you to perform <u>any</u> mounting to walls or penetration (including chipping) into the ground, walls floors, sub-floors, and or any excavation, trenching, including the use of stakes or poles deeper then 1 5/8"? **All Concrete Must be scanned!**	YES ☐	NO ☐
Have bldg materials been evaluated for asbestos?	YES ☐	NO ☐

4. Excavation and Trenching

Will this work scope involve any excavation below 5 feet?	YES ☐	NO ☐
Will this work scope involve sewer line repair or replacement?	YES ☐	NO ☐
Contractor must submit the following items for Excavation and Trenching		
JHA detailing Shoring Plan	YES ☐	NO ☐
Training Records	YES ☐	NO ☐
EH&S to complete: are training records on file w/ EH&S: YES ☐ NO ☐		

5. Demolition

Have you the Contractor signed off on the LBNL Isolation Plan: Electrical, Gas, Water, Steam, or other Utilities?	YES ☐	NO ☐
Contractor must submit the following items for Demolition Plan:		
JHA detailing the scope of work	YES ☐	NO ☐
EH&S to complete: are training records on file w/ EH&S: YES ☐ NO ☐		

6. Traffic Control

Will this work scope require ANY road disruptions?	YES ☐	NO ☐
Will this work require LBNL Security escort for over-sized loads	YES ☐	NO ☐
Contractor must submit the following items for Traffic Control:		
Traffic Plan	YES ☐	NO ☐
Training Records for Flaggers	YES ☐	NO ☐
EH&S to complete: are training records on file w/ EH&S: YES ☐ NO ☐		

7. Scaffold

Will Scaffold be used on this project?	YES ☐	NO ☐
Tubular & Coupler Scaffolding	YES ☐	NO ☐
Rolling Scaffold	YES ☐	NO ☐
Mobile Scaffold	YES ☐	NO ☐
Mason/Bricklayers Scaffold	YES ☐	NO ☐
Contractor must submit the following items for Scaffold:		
Training Records for each person erecting, disassembling scaffold.	YES ☐	NO ☐
A Written Fall Protection Plan	YES ☐	NO ☐
Training Records for Fall Protection	YES ☐	NO ☐
Training Records for "End User" Scaffold	YES ☐	NO ☐
EH&S to complete: are training records on file w/ EH&S: YES ☐ NO ☐		

8. Hazardous Energy Control

1. Will you be doing any work that requires LOTO as specified by applicable local, state & federal regulations? *LOTO is Lockout/Tagout/Block-out, where a person uses a lock, tag, and/or block to isolate a hazardous energy source prior to working.*	YES ☐ NO ☐
2. Are you doing electrical work?	YES ☐ NO ☐
3. Are you removing or opening any electrical equipment covers of electrical equipment? For example boxes, panels, disconnect switches, etc.	YES ☐ NO ☐
4. Are you doing any work (including non-electrical) within 4 feet of open or exposed live electrical equipment?	YES ☐ NO ☐
5. Are you doing any demolition work that will remove electrical equipment, walls, partitions, building structures, piping systems, ducts, etc.?	YES ☐ NO ☐
6. Is there an energy hazard associated with your work or near your work? [ ] Electrical [ ] Mechanical [ ] Pneumatic [ ] Chemical [ ] Hydraulic [ ] Water [ ] Steam [ ] Gas	YES ☐ NO ☐
7. Will you be servicing, maintaining, or modifying equipment?	YES ☐ NO ☐
8. Are you working in the travel path of a crane, hoists, or other equipment that present crush or pinch hazards?	YES ☐ NO ☐
9. Are you working on any piping systems? For example, water, chemical, HVAC, oil, air, etc.	YES ☐ NO ☐
10. Are you working on installing, repairing or modifying rotating equipment?	YES ☐ NO ☐
If any question has a YES answer, you must complete the LOTO workbook.	

9. Aerial Lifts

Will Aerial Lifts be used on this project?	YES ☐	NO ☐
Aerial Lift, Articulating Boom Lift Scissor Lift Man-Lift	YES ☐ YES ☐ YES ☐ YES ☐	NO ☐ NO ☐ NO ☐ NO ☐
Contractor must submit the following items for Aerial Lifts: Training Records for each person operating lift. EH&S to complete: are training records on file w/ EH&S: YES ☐ NO ☐	YES ☐	NO ☐

10. Cranes & Heavy Equipment

Will the work require use of the following equipment?	YES ☐	NO ☐
Backhoe, Loader, Excavator	YES ☐	NO ☐
Crane Over 3 Tons	YES ☐	NO ☐
Forklift	YES ☐	NO ☐
Contractor must submit the following items for Crane Heavy Equipment: Cranes current annual inspection certification: Cranes quadrennial proof load test certification: Crane operator license: Forklift Certification/License: EH&S to complete: are training records on file w/ EH&S: YES ☐ NO ☐	 YES ☐ YES ☐ YES ☐ YES ☐	 NO ☐ NO ☐ NO ☐ NO ☐

11. Fire Protection & Prevention

Will work include the use of open flames such as torches, welders, grinders, tar pots or any other tool or process/procedure that could cause sparks or open flames?	YES ☐	NO ☐
Will work be performed near combustible storage containers?	YES ☐	NO ☐
Will there be on-site refueling?	YES ☐	NO ☐
Has the Fire Watch been training in the use of fire extinguisher and emergency procedures for the work being performed?	YES ☐	NO ☐

12. Ladders

Will Ladders be used on this project?	YES ☐	NO ☐
6’ or smaller A-Frame Ladder	YES ☐	NO ☐
12’ or greater A-Frame Ladder.	YES ☐	NO ☐
Extension Ladder over 24’	YES ☐	NO ☐
Contractor must submit a Fall Protection Plan for ladders if working above 6’ EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐	YES ☐	NO ☐

13. Steel Erection and Assembly

Will steel erection be apart of this work scope?	YES ☐	NO ☐
Contractor must submit the following items for Steel Erection and Assembly: A Site-Specific Erection plan A Fall Protection Plan (ANSE/ASSE Z359 included)	 YES ☐ YES ☐	 NO ☐ NO ☐

14. Roofing Work for ROOFERS (repair, installation of roof)

Will roofing or roof top repairs be performed within 6' of the leading edge?	YES ☐	NO ☐
Contractor must submit the following items for Roofing Work A Fall Protection Plan indicating the fall protection system to be used for roofing work 6' or more above lower levels and 6' from an unprotected edge. (include ANSE/ASSE Z359) Training Records for all person working on the roof EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐	YES ☐ YES ☐	NO ☐ NO ☐

15. Fall Protection for NON ROOFERS performing work on roof tops

When working on a flat roof, employees shall remain 15-ft. back from the edge and use a flag warning system. If the work requires employees to work within 15-ft. from the edge they will be protected by a fall protection system.

Will this work scope require non-roofers to work within 15 ft of the leading edge?	YES ☐	NO ☐
Contractor must submit the following items for Fall Protection for NON ROOFERS Fall Protection Plan (ANSE/ASSE Z359 included) Training Records EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐	 YES ☐ YES ☐	 NO ☐ NO ☐

B. INDUSTRIAL HYGIENE

Certain existing building components or materials that may be impacted by the work of this project are known or presumed to contain hazardous materials including, but not limited to, asbestos and lead. Comply with the applicable abatement sections and safety requirements of the contract documents. Should the contractor(s) or subcontractor(s) determine or believe that any building component or material, not already noted as containing a hazardous material, contains asbestos, lead, or other hazardous material, they shall notify LBNL immediately. Common building materials that contain asbestos at LBNL include floor tile and mastic, sheetrock and taping compound, pipe insulation, fire doors, and transite. Paint surfaces and settled dust commonly contain lead. Prior to disturbing building materials check with LBNL to evaluate the hazard and prescribe controls.

Construction materials that contain hazardous materials such as asbestos, lead, and mercury must be approved by Facilities Construction Management prior to installing.

Per DOE's Worker Protection Rule (10 CFR 851), the subcontractor is required to perform their own exposure assessments for hazardous materials.

Hazard Communication/Toxic Substances

Will the scope of your work require the use of hazardous substances? If so, check all that apply below and include requested information.	YES ☐	NO ☐

16. Hazardous Materials

Will the work involve the use of any chemicals, such as paints, solvents, adhesives, epoxy coatings; fuels or other hazardous materials?	YES ☐	NO ☐
Are all personnel using these materials trained in safe handling?	YES ☐	NO ☐
Will emergency eyewash and shower be available near the worksite? If NO, provide at a minimum, a portable eyewash station that is capable of providing 15 minutes of continuous water flow (handheld squeeze bottle type is not allowed).	YES ☐	NO ☐
Will employees be exposed to airborne concentrations of hazardous gas, fume, dust or mist?	YES ☐	NO ☐
Will MSDS be available to the workers onsite?	YES ☐	NO ☐
Will Respirators be required?	YES ☐	NO ☐
Describe the type of respiratory equipment to be used:_____ _____ _____		

17. Confined Space Entry

Confined Space Entry permit are obtained from the LBNL Project Manager.

Will the scope of your work require you to be working in a confined space (including manholes) where combustible, toxic, or other hazardous materials may be present?	YES ☐	NO ☐
Contractor must submit the following items for Confined Space Entry:		
JHA for Confined Space (link)		
Sub's Confined Space Program	YES ☐	NO ☐
Atmospheric testing records	YES ☐	NO ☐
Entry Permits (ongoing submittals)	YES ☐	NO ☐
Training records	YES ☐	NO ☐
EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐	YES ☐	NO ☐

18. Welding / Hot Cutting

Will the work involve welding/cutting steel at paint surface? ***Request surface area be testing for Lead***	YES ☐	NO ☐
Will the work involve welding/cutting stainless steel?	YES ☐	NO ☐
Contractor must submit the following items for non lead related (i.e., new steel construction)		
Qualitative ½ mask negative pressure respirator fit test records	YES ☐	NO ☐
Medical approval to wear respirators	YES ☐	NO ☐
Respirator Program	YES ☐	NO ☐
EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐		
Contractor must submit the following items for lead related welding/hot cutting where lead paint exists or has been abated:	YES ☐	NO ☐
Quantitative full face-piece Powered Air Purifying Respirator (PAPR) fit test records	YES ☐	NO ☐
Medical approval to wear respirators	YES ☐	NO ☐
Documentation that workers have received lead awareness training.	YES ☐	NO ☐
Respirator Program	YES ☐	NO ☐
Blood lead baseline sample results (excluding employee SSNs)		
EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐		
Contractor must submit the following items for stainless steel welding/hot cutting:	YES ☐	NO ☐
Quantitative full face-piece negative pressure respirator fit test records.	YES ☐	NO ☐
Medical approval to wear respirators	YES ☐	NO ☐
Documentation of hexavalent chromium training.	YES ☐	NO ☐
Respirator Program		
EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐		

19. Lead Paint Removal

Will the work involve sanding, grinding, scraping, brazing, cutting, welding, or otherwise disturbing painted surfaces in such a way that lead particles may become airborne?	YES ☐	NO ☐
Contractor must submit the following items for Lead Paint Removal:		
JHA that addresses lead hazards	YES ☐	NO ☐
Site Specific Lead Compliance Plan	YES ☐	NO ☐
Respiratory Protection Program	YES ☐	NO ☐
Company's Lead Compliance Program	YES ☐	NO ☐
Air Monitoring Data (ongoing submittal item)	YES ☐	NO ☐
Department of Health Services Lead Worker Training Certificates	YES ☐	NO ☐
Full face-piece negative pressure respirator quantitative fit test	YES ☐	NO ☐
Medical approvals for respirator use	YES ☐	NO ☐
EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐		

20. Asbestos

Will the work require asbestos removal?	YES ☐	NO ☐
Will the work require a 10 day notification to (BAAQMD) for renovations involving RACM greater than or equal to 100 linear feet 100 sq ft, or 35 cu ft prior to renovations?	YES ☐	NO ☐
Contractor must submit the following items for Asbestos:		
BAAQMD renovation/demolition forms prior to sending to the BAAQMD for review by LBNL EH&S Environmental Services	YES ☐	NO ☐
Site Specific Asbestos Compliance Plan	YES ☐	NO ☐
JHA addressing asbestos hazards	YES ☐	NO ☐
Respiratory Protection Program	YES ☐	NO ☐
Air Monitoring Data (ongoing submittal item)	YES ☐	NO ☐
Company's Asbestos Program	YES ☐	NO ☐
AHERA Asbestos Worker Training Certificates	YES ☐	NO ☐
Medical approvals & fit test records for respirator use	YES ☐	NO ☐
EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐		

21. Painting Walls

Does the scope of your work include sanding walls and/or ceilings or washing of exterior walls?	YES ☐	NO ☐
Does the scope of work include painting how will the paint be applied:		
Spraying	YES ☐	NO ☐
Rolled	YES ☐	NO ☐
Contractor must submit the following items for Painting Walls:		
JHA detailing the work plan	YES ☐	NO ☐
Respiratory Protection Program	YES ☐	NO ☐
Qualitative respirator fit test records	YES ☐	NO ☐
Medical approval to wear respirators	YES ☐	NO ☐
EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐		

22. Sanitation

Will the company provide washing facilities and toilets as required?	YES ☐	NO ☐

23. Silica Dust

Will work involve jack-hammering, roto-hammering, drilling, grinding or other disturbance of concrete or use of products that contain crystalline silica that might create silica dust? Wet slab/wall concrete cutting, drilling, and coring or cutting/sanding drywall or joint compound?	YES ☐	NO ☐
Describe below the method of dust control and control of worker and other persons who could be exposed. _____ _____ _____		
Contractor must submit the following items **Indoor work** will require: Full face-piece negative pressure respirators for indoor work. (quantitative fit test records). **Outdoor work** will require at a minimum: ½ mask negative pressure respirator. (qualitative fit test records).		
Medical approvals to wear respirators.	YES ☐	NO ☐
Documentation of silica hazards awareness training.	YES ☐	NO ☐
Respirator Program	YES ☐	NO ☐
JHA describing silica hazards	YES ☐	NO ☐
EH&S to complete: are training records on file w/EH&S: YES ☐ NO ☐	YES ☐	NO ☐

24. Heat Stress Program

Is Heat Stress a potential Hazard for this work?	YES ☐	NO ☐
Will a rest area be provided in a cooler environment?	YES ☐	NO ☐
Will the company provide drinking water, cups and waste receptacle?	YES ☐	NO ☐
Has training on recognizing the signs & symptoms of heat stress & heat stroke been provided to workers and supervisors?	YES ☐	NO ☐

25. Ergonomics Program

Does your company have an Ergonomics Program	YES ☐	NO ☐

26. Radiation and Laser Safety

The LBNL Project Manager must be notified one work week in advance and a radiological work permit must be obtained from the LBNL EH&S Division

Will radioactive material/sources be used?	YES ☐	NO ☐
Will you be working on a class 3B or Class 4 laser or microwave source greater than 5mW/cm2?	YES ☐	NO ☐
Describe below:_____ _____ _____ _____		

27. Storm Water Pollution Prevention Plan

Will a project specific SWPPP be submitted to LBNL for review?	YES ☐	NO ☐

SELLER'S REP (PRINT):	
SELLER'S SIGNATURE:	
DATE:	
PHONE:	

FOR BERKELEY LAB USE ONLY

ENVIROMENT AND SAFETY HAZARDS CONTROL
REVIEW OF CHECK-LIST:

REVIEW STATUS:

☐–**Work may proceed.**
Only the LBNL Construction Safety Engineer, EH&S Safety Manager or designated alternatives may approve Safety Check List

☐–**EHS Reviewed with Comments:**_____

☐ **UNSATISFACTORY - WORK MAY NOT PROCEED**. Provide the following information: ☐ **RE-SUBMIT**

REVIEWED BY EHS: _____

REVIEWED DATE: _____

APPROVED BY: _____

APPROVED DATE: _____

Construction Sign-in Sheet

Name: **Date: _____ Time: _____**

Print	**Signature**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Notes: Field Changes:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Appendix E – Requirements for Site Specific Safety Plan

Site Specific Safety Plan

Site Specific Safety Plan shall contain at a minimum:

List by name & phone numbers the following person who will be on the project:

Submit: Name of the On-site Superintendent & Phone.

Submit: Name of the On-site Health and Safety Representative & Phone.

Submit: Name of the person who is responsible for the implementation of safety plan.

Submit: Resume & qualification of the person who is responsible for implantation of this projects safety plan. Include OSHA certifications.

Submit: The companies' Policy statement on environment, safety and health.

Submit: The companies' Policy on substance abuse and testing policy.

Submit: The companies' Code of Safe Practices.

Submit: The companies' Incident of reporting, first aid procedures, and an Site Specific emergency evacuation plan.

Submit: The companies' safety recognition/incentive policy that will be in effect for this project if applicable.

Submit: Agenda for Plan of the Day safety meeting , Time it will be conducted each day: _____ _
Who will conduct the meeting: _____

Submit: A list of those activities for which subsequent Job-Hazard Analysis will be required.

Submit: List of all competent persons overseeing those tasks in which OSHA requires such person(s), such as excavation, confined space, fall protection, etc.

Submit: Provisions for conducting and documenting job site safety inspection by supervision.

Submit: Training records for all employees used to meet OSHA training requirements.

Appendix F – Emergency Contact Information

Emergency Response Guide Contact Phone Numbers

Fire Emergency Numbers:

LBNL Phones with 486 and 495 prefix	**x7911**
Non-LBNL buildings JGI in Walnut Creek and OSF in Oakland	**9-911**
All other Phones (cell or Pac Bell)	**911 or (510) 486-6015**
Security (Blackberry Gate)	**x 5472**

Radiation Spill:

If there is a medical emergency or danger to life, health or environment	**x7911 or 9-911**
Bob Fairchild	**ext 2278**
Chris Donahue	**ext 7736**

Chemical Spill:

If there is a medical emergency or danger to life, health or environment	**x7911 or 9-911**
Larry McLouth	**x7911 or 9-911**

Biological Spill:

If there is a medical emergency or danger to life, health or environment	**x7911 or 9-911**
Bruce King	**x7911 or 510-840-5013**
David Rogers	**x7676**

Personal Injury:

All injuries are to be reported to Health Services	**x6266**
Request emergency medical attention	**x7911 or 9-911**

Earthquake:
If there is a medical emergency or danger to life, health or environment **x7911 or 9-911**

Wildland Fire:
LBNL Phones with 486 and 495 prefix **x7911**

All other Phones (cell or Pac Bell) **911 or (510) 486-6015**

Security (Blackberry Gate) **x 5472**

Threats:
Call **x7911 or 9-911**

Suspicious Packages & Mail:
Immediately call **x7911 or 9-911**

LBNL Project Manager: _____
Immediately call **(510) _____-_____**

LBNL Construction Manager: _____
Immediately call **(510) _____-_____**

LBNL Construction Safety: _____
Immediately call **(510) _____-_____**

Subcontractor Construction Manager: _____
Immediately call **(510) _____-_____**

Subcontractor Safety Professional: _____
Immediately call **(510) _____-_____**

Appendix G – HSS Overview of 10 CFR 851

A Basic Overview of the

WORKER SAFETY AND HEALTH PROGRAM (10 CFR 851)

Outreach & Awareness Series to Advance DOE Mission

Office of Health, Safety and Security (HSS)
U.S. Department of Energy

May 2009

A Basic Overview of the

WORKER SAFETY AND HEALTH PROGRAM RULE

(10 CFR 851)

OVERVIEW

The Department of Energy (DOE) is undergoing a major operational and mission renaissance in response to the President's and the Secretary's priorities. These mandates include rapid implementation of the economic recovery package, enhancing energy security, restoring science leadership, reducing greenhouse emissions, and enhancing the Nation's nuclear security.

Realizing these objectives involve the creation of hundreds of new positions and jobs resulting in hiring and recruitment of thousands of new skilled workers throughout the DOE complex. Many of these new workers may be unfamiliar with the way safety and health requirements are implemented at DOE worksites.

This pamphlet is developed as part of the Office of Health, Safety and Security's (HSS) outreach and awareness campaign to proactively advance safe execution of the DOE mission. It is intended to provide an abbreviated summary of regulatory requirements and performance expectations provided in Title 10, Code of Federal Regulations, Part 851, *"Worker Safety and Health Program."* The Worker Safety and Health Rule serves as the Department's overarching regulatory framework to protect the safety and health of thousands of contract workers just as the Occupational Safety and Health Administration does for private sector workers. The safety of workers and safe execution of the DOE mission is a DOE line management responsibility. However, its ultimate success depends greatly on collective and informed collaboration of many stakeholders, including DOE Headquarters; Field Offices; Labor Unions; safety, environment, health, and security professionals; and Federal and contractor organizations and workers.

HSS stands ready to provide programmatic consultation, scientific subject matter expertise, and technical assistance related to a wide range of worker safety and health issues and topics. Please do not hesitate to contact us with any questions or need for assistance.

Glenn S. Podonsky

Chief, Health Safety and Security Officer
U.S. Department of Energy

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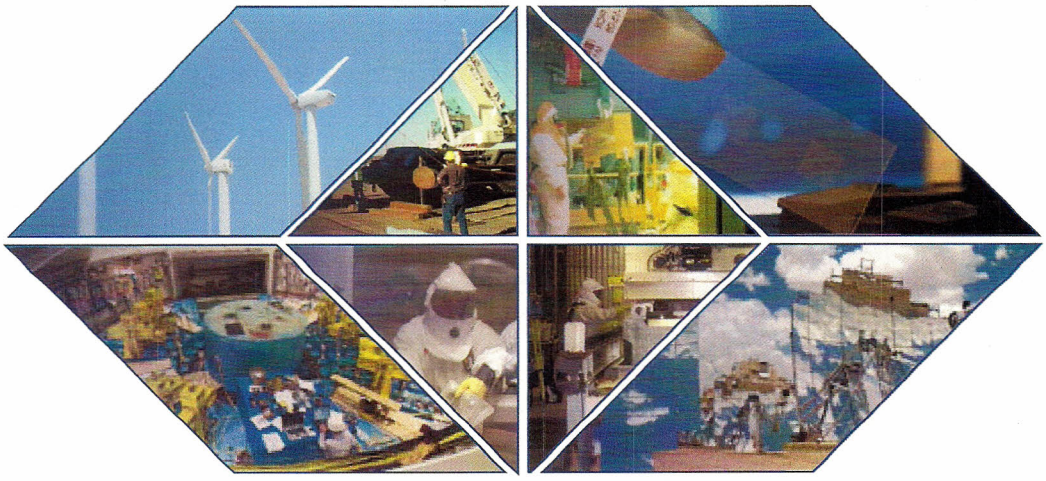
What is the Worker Safety and Health Rule?

On February 9, 2006, the Department of Energy (DOE) published in the Federal Register Title 10, Code of Federal Regulations (CFR), Part 851, *"Worker Safety and Health Program"* (the Rule) pursuant to DOE's authority under the Atomic Energy Act of 1954 and subsequent reorganization acts.

The Rule establishes the framework for DOE's non-radiological worker safety and health programs just as the Occupational Safety and Health Administration (OSHA) does for the private industry. 10 CFR 851 provides DOE contractor workers with safe and healthful workplaces in which hazards are abated, controlled, or otherwise mitigated in a manner that provides reasonable assurance that workers are protected from the hazards associated with their jobs. To accomplish this objective, the Rule establishes management responsibilities, workers rights, required safety and health standards, and training on the hazards of their jobs as well as how to control the hazards.

A copy of the Rule can be viewed at:

http://www.hss.energy.gov/HealthSafety/WSHP/rule851/851final.html



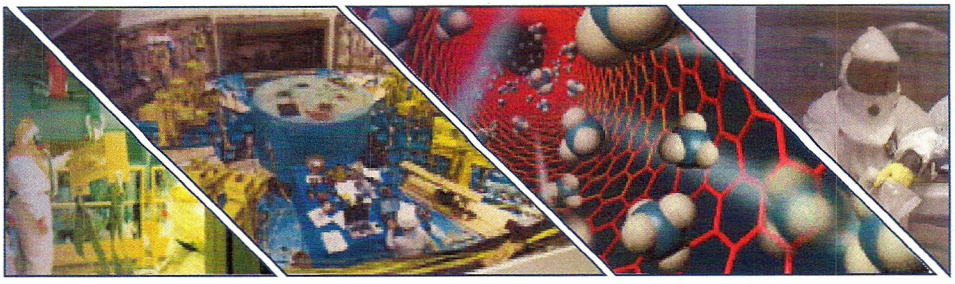
Who does the Worker Safety and Health Rule Apply to?

The Rule applies to work performed by contractors at DOE sites. A contractor means any one under contract with DOE, including subcontractors at any tier, and any affiliated entity such as a parent organization. Contractor activities include design, construction, operation, maintenance, decontamination and decommissioning, research and development, and environmental restoration related work.

The Rule requires DOE contractors to perform work in a manner that protects the safety and health of workers, without regard to whether the workers are employed by a contractor engaged in a nuclear or a non-nuclear activity.

The Rule does not apply:

- At sites regulated by OSHA or sites operated by Naval Nuclear Propulsions;
- An organization working at a DOE site that is regulated by OSHA. For example, other federal organizations and organizations conducting work on a DOE site under a "Community Re-Use" arrangement. In this case, DOE contractors should inform the OSHA covered organization's representatives about the site hazards and the DOE contractor's worker safety and health program prior to the commencement of work in order to protect those workers and to avert those workers from creating hazards to DOE contractor workers;
- Radiological hazards or nuclear explosives operations covered by 10 CFR Parts 20, 820, 830 or 835;
- Activities performed away from a DOE site; or
- Transportation activities to and from a DOE site.



What does the Rule Require of Management?

The Rule requires management to:

- Establish written policy, goals and objectives for the safety and health program;
- Provide DOE a copy of their written Worker Safety and Health Program (WSHP) describing the methods they will use to implement the requirements of the Rule;
- Use qualified safety and health staff (e.g., certified industrial hygienist, safety professional) to direct and manage the program;
- Assign worker safety and health program responsibilities, evaluate personnel performance and hold personnel accountable for workers safety and health performance;
- Provide mechanisms to involve workers and their elective representatives in development of the worker safety and health program goals, objectives, and performances measures and in the identification and control of hazards in the workplace;
- Establish procedures for workers to report without reprisal job-related fatalities, injuries, illnesses, incidents, and hazards, and make recommendations about appropriate ways to control those hazards;
- Provide for prompt response to such reports and recommendations;
- Provide for regular communication with workers about workplace safety and health matters;
- Establish procedures to permit workers to stop work or decline to perform an assigned task because of a reasonable belief that the task poses an imminent risk of death, serious physical harm, or other serious hazard to workers, in circumstances where the workers believe there is insufficient time to utilize normal hazard reporting and abatement procedures; and
- Inform workers of their rights and responsibility by appropriate means, including posting the DOE-designated Worker Protection Poster in the workplace where it is accessible to all workers. A copy of the poster, in English or Spanish, may be obtained at:

  http://www.hss.energy.gov/HealthSafety/WSHP/rule851/851final.html

What does the Rule Require of Workers?

Workers are required to comply with the Rule's requirements and the worker safety and health program that are applicable to their own actions and conduct.

Workers have the right, without reprisal, to:

- Participate in activities described in the Rule on official time and have access to:
  - DOE safety and health publications;
  - The worker safety and health program for their workplace;
  - The standards, controls, and procedures applicable to their workplace;
  - The safety and health poster that informs the worker of relevant rights and responsibilities;
  - Information on the recordkeeping log (OSHA Form 300). Access is subject to Freedom of Information Act requirements and restrictions; and
  - The DOE Form 5484.3 (the DOE equivalent to OSHA Form 301) that contains the employee's name as the injured or ill worker.
- Be notified when monitoring results indicate the worker was overexposed to hazardous materials;
- Observe monitoring or measuring of hazardous agents and have the results of their own exposure monitoring;
- Have a representative authorized by employees accompany the DOE or their authorized personnel during physical inspection of the workplace for the purpose of aiding the inspection. When no authorized employee representative is available, the DOE or their authorized representative will consult with employees on matters of worker safety and health;
- Request and receive results of inspections and accident investigations;
- Express concerns related to worker safety and health;
- Decline to perform an assigned task because of a reasonable belief that, under the circumstances, the task poses an imminent risk of death or serious physical harm to the worker coupled with a reasonable belief that there is insufficient time to seek effective redress through normal hazard reporting and abatement procedures; and
- Stop work when the worker discovers employee exposure to imminently dangerous conditions or other serous hazards; provided that any stop work authority must be exercised in a justifiable and responsible manner in accordance with procedures established in the approved worker safety and health program.

What are the Training and Information Requirements?

The Rule requires contractors to develop and implement a worker safety and health training and information program to ensure that all workers exposed or potentially exposed to hazards are provided with training and information on the hazards. Also, contractors are required to provide:

- Training and information for new employees before or at the initial assignment to a job;
- Periodic training as often as necessary to ensure that workers are adequately trained and informed;
- Additional training when safety and health information or a change in workplace conditions indicates that a new or increased hazard exists; and
- Training and information to workers who have worker safety and health program responsibilities that is necessary for them to carry out those responsibilities.

What are the Basic Elements of the Worker Safety and Health Program?

The following requirements reflect what the Department considers the essential elements of a successful worker safety and health program:

- Management responsibilities and worker rights (851.20);
- Hazard identification and assessment (851.21);
- Hazard prevention and abatement (851.22);
- Safety and health standards (851.23);
- Functional areas (851.24);
- Training and information (851.25); and
- Recordkeeping and reporting (851.26).

The Department recognizes that the worker safety and health program must be an integrated part of other related site-specific worker protection activities and the integrated safety management system [851.11(a)(3)(ii)]. Specifically, an acceptable worker safety and health program integrates the workplace hazards of the functional areas addressed in Appendix A with other site hazards such as radiation, nuclear security, and emergency response.

What Resources are Available to Assist with Development and Implementation of an Effective Worker Safety and Health Program?

- DOE G 440.1-8, *Implementation Guide for Use with 10 CFR 851 Worker Safety and Health Program.*

  This Guide provides non-mandatory supplemental information on acceptable methods for implementing requirements including, lessons learned, instructions, suggested practices, and performance measures. A copy of the guide can be viewed at:

  http://www.directives.doe.gov/cgi-bin/explhcgi?qry1601187505;doe-210

- The Office of Health, Safety and Security (HSS) Web Resources:
  - Worker Safety and Health Rule:

    http://www.hss.energy.gov/healthsafety/WSHP/rule851/851final.html
  - Introduction to 10 CFR 851 Video:

    http://www.hss.energy.gov/healthsafety/WSHP/rule851/10CFR851Video.asx
  - HSS - Safety Page:

    http://www.hss.energy.gov/safety.html
  - HSS - Health Page:

    http://www.hss.energy.gov/health.html

Who Should I Contact if I Have a Concern or Question?

If you have a concern or question you should contact:

- Your Supervisor;
- Your Safety and Health Professional on site;
- Your Employee Concern Program;
- The Office of Worker Safety and Health Policy, HS-11;

  http://www.hss.energy.gov/HealthSafety/WSHP
- The Office of Worker Safety and Health Enforcement, HS-41.

  http://www.hss.energy.gov/enforce

Table 1 below provides a simplified overview of 10 CFR 851 performance expectations. This table can be used as a starting point by any organization to perform a self-assessment of its worker safety and health program.

Table 1: 10 CFR 851 Performance Expectations

Requirement	Performance Expectation[1]	Policy and Guidance Available[2]		
		Yes	No	N/A
Subpart A – General Provisions				
Subpart B – Program Requirements				
Development and approval of the worker safety and health program [851.11(a)]	Has a worker safety and health program been prepared and submitted to DOE for approval?			
DOE evaluation and approval [(851.11(b)]	Has the plan been approved by the DOE?			
Updates [851.11(c)]	Has the plan been updated on an annual basis and submitted to the DOE for approval?			
Labor organizations [851.11(d)]	Have the labor organizations been notified of the development and implementation of the worker safety and health program?			
Subpart C – Specific Program Requirements				
Management Responsibilities and Worker Rights and Responsibilities (851.20)				
Policy, Goals, and Objectives [851,20(a)(l)]	Are there written policy, goals, and objectives for the worker safety and health program?			
Qualified Staff [851.20(a)(2)]	Are there technical qualification standards to ensure the safety and health professionals are qualified to manage the worker safety and health program?			
Accountability [851.20(a)(3)]	Are the safety and health roles, responsibilities and authorities clearly delineated for workers at all levels?			
Employee Involvement [851.20(a)(4) & (b)(5)]	Are the workers and their representatives involved in the development of the worker safety and health program goals, objectives, and performance measures and in the identification and control of hazards in the workplace?			
Access to Information [851.20(a)(5) & (b)(2), (3), (4), (5), (6), (l0)]	Can the workers readily access information relevant to the worker safety and health program?			
Reporting of Events and Hazards [851.20(a)(6),(7) & (b)(7)]	Are there established procedures for workers to report, without reprisal, job-related fatalities, injuries, illnesses, incidents, and hazards and make recommendations about appropriate ways to control those hazards? Are there established procedures for prompt response to the reports and recommendations made by workers?			
Regular Communications [851.20(a)(8)])	Are there established procedures for regular communication, such as weekly safety meetings, with workers about workplace safety and health matters?			

[1] These basic performance expectations should be supplemented by additional ones based on 10 CFR 851 requirements.
[2] If YES, identify specific site policy and guidance. If NO, ensure appropriate site policy and guidance is developed.

Table 1: 10 CFR 851 Performance Expectations *(Continued)*

Requirement	Performance Expectation[1]	Policy and Guidance Available[2]		
		Yes	No	N/A
Subpart C – Specific Program Requirements *(Continued)*				
Management Responsibilities and Worker Rights and Responsibilities (851.20) *(Continued)*				
Inform Workers of Rights [851.20(a)(10)]	Are there established procedures to inform workers of their rights and responsibilities by appropriate means, such as training?			
Stop Work Authority [851.20(a)(9) & (b)(8),(9)]	Are there established procedures to permit workers to stop work or decline to perform an assigned task which is not safe to perform?			
Hazard Identification and Assessment (851.21)				
Identify and Assess Risks [851.21(a)]	Are there established procedures to identify workplace hazards and to assess the risk of associated worker injury or illness?			
Assess Workers Exposures [851.21(a)(l) & (c)]	Are there established assessments of chemical, physical, biological, and safety workplace hazards?			
Document and Record Hazard Assessments [851.21(a)(2) & (3)]	Are the hazard assessments documented for the identified chemical, physical, biological, and safety hazards? When recording observations, testing and monitoring results, does the recording process and results follow the quality assurance plan consistent with DOE O 414.1C *Quality Assurance*.			
Analyze Designs for Potential Hazards [851.21(a)(4)]	Are safety professionals involved in hazards analysis during conceptual, preliminary, and final design to ensure that the facility was designed in accordance with national safety and health standards and within regulatory requirements, including 10 CFR 851, 29 CFR 1910, and 10 CFR 835?			
Evaluate Operations, Procedures, and Facilities to Identify Workplace Hazards[851.21(a)(5)]	Are workers and supervisors involved in a team environment with the safety professionals in evaluating operations, procedures, and facilities? Do workers and supervisors conduct daily workplace evaluations to identify workplace hazards?			
Job Activity-Level Hazard Analysis [851.21(a)(6) & (8)]	Is Job Hazard Analysis (JHA) being conducted for situations including 1) existing operations and procedures that have not been adequately evaluated in the past or when there is no current hazard analysis available; 2) in response to employee identified potential hazards; and 3) for existing operations and procedures that have resulted in injuries, illnesses, or near misses? Are the workers and their supervisor involved in the JHAs? Are JHAs being performed by subcontractors as part of their workplace safety program?			

[1] These basic performance expectations should be supplemented by additional ones based on 10 CFR 851 requirements.
[2] If YES, identify specific site policy and guidance. If NO, ensure appropriate site policy and guidance is developed.

Table 1: 10 CFR 851 Performance Expectations *(Continued)*

Requirement	Performance Expectation[1]	Policy and Guidance Available[2]		
		Yes	No	N/A
Subpart C – Specific Program Requirements *(Continued)*				
Hazard Identification and Assessment (851.21) *(Continued)*				
Review Safety and Health Experience [851.21(a)(7)]	Is site/project safety and health experience information reviewed for trends and lessons learned, including accident investigations, injuries, and illnesses and analysis of related data?			
Hazard Prevention and Abatement (851.22)	Does the current hazard abatement program ensure that workers are protected from exposure to workplace hazards? Is the hazard abatement program consistent with the following selection approach – hazard elimination; passive engineering controls; active engineering controls; administrative controls; and then personal protective equipment?			
Safety and Health Standards (851.23)	Has a list of safety and health standards been established and kept up-to-date for the workplaces and activities to control the recognized hazards?			
Functional Areas (851.24)	Does the worker safety and health program address the functional areas listed in Appendix A that are applicable to the hazards of the site?			
Training and Information (851.25)	Is there a worker safety and health training and information program to ensure that workers can perform their duties in a safe and healthful manner?			
Recordkeeping and Reporting (851.26)	Is there an adequate recordkeeping and reporting program to document and retain record on information including hazard inventories, hazard assessments, worker exposure monitoring, and worker exposure controls?			
Subpart D – Variances				
Temporary Variance (851.31(d)(1))	Is the application being submitted 30 days before the effective date of the new safety and health standard?			
	Is there a statement explaining why you are unable to comply with the standard or portion(s) thereof by its effective date?			
	Is there a detailed statement explaining the factual basis and representations of qualified persons that support the statement?			
	Is there a statement explaining the steps taken and plans to take, with specific dates if appropriate, to protect workers against the hazard?			

[1] These basic performance expectations should be supplemented by additional ones based on 10 CFR 851 requirements.
[2] If YES, identify specific site policy and guidance. If NO, ensure appropriate site policy and guidance is developed.

Table 1: 10 CFR 851 Performance Expectations *(Continued)*

Requirement	Performance Expectation[1]	Policy and Guidance Available[2]		
		Yes	No	N/A
Subpart D – Variances *(Continued)*				
Temporary Variance (851.31(d)(1)) (Continued)	Is there a statement explaining when you expect to comply with the standard, and what steps you have taken and plan to take with specific dates if appropriate, to come into compliance with the standard?			
	Is there a statement of the facts that you would show to establish that:			
	– You are unable to comply by the effective date because of unavailability of professional or technical personnel?			
	– Or, you are unable to comply by the effective date because materials or equipment needed to come into compliance with the standard?			
	– Or, you are unable to comply by the effective date because necessary construction or alteration of facilities cannot be completed by the effective date of the standard?			
	Is there a statement of the facts that you would show to establish that you are taking all steps to safeguard the workers against the hazards covered by the standard?			
	Is there a statement of the facts that you would show to establish that you have an effective program for coming into compliance with the standard as quickly as practicable?			
Permanent Variance (851.31(d)(2))	Is there a description of the conditions, practices, means, methods, operations, or processes used or proposed to be used?			
	Is there a statement showing how the conditions, practices, means, methods, operations, or processes used, or proposed to be used, would provide workers a place of employment which is as safe and healthful as would result from compliance with the standard that you are seeking a variance from?			
National Defense (851.31(d)(3))	Is there a statement showing that the variance sought is necessary to avoid serious impairment of national defense?			
	Is there a statement showing how the conditions, practices, means, methods, operations, or processes used or proposed to be used would provide workers a safe and healthful place of employment in a manner that is consistent with the standard from which a variance is sought?			

[1] These basic performance expectations should be supplemented by additional ones based on 10 CFR 851 requirements.
[2] If YES, identify specific site policy and guidance. If NO, ensure appropriate site policy and guidance is developed.

Table 1: 10 CFR 851 Performance Expectations *(Continued)*

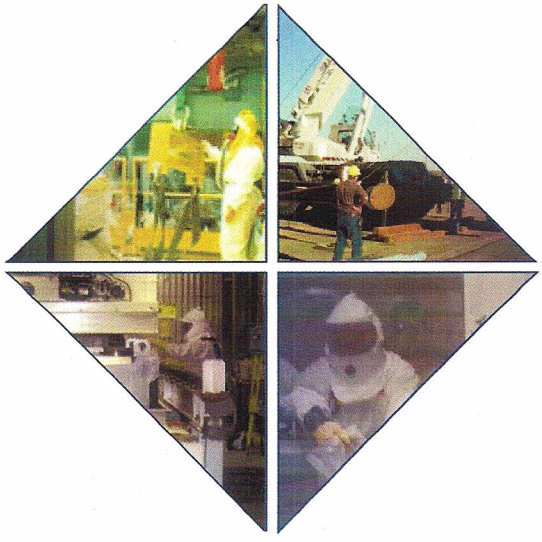
Requirement	Performance Expectation[1]	Policy and Guidance Available[2]		
		Yes	No	N/A
Appendix A - Program Functional Areas				
Construction Safety	Has a written Construction Project Safety and Health Plan been developed and approved prior to commencement of construction activities?			
	Are Job Hazard Analyses (JHAs) being implemented for all construction activities?			
	Is there a designated representative on site at all times during active construction?			
Fire Protection	Is the fire safety and emergency response program implemented and maintained?			
	Is the program in compliance with applicable building codes and National Fire Protection Association (NFPA) codes and standards?			
Explosive Safety	Is there an established explosives safety program and is it being implemented consistent with DOE M 440.1-1A *Explosives Safety Manual*?			
Pressure Safety	Are there established safety policies and procedures to ensure that pressure systems are designed, fabricated, tested, inspected, maintained, repaired, and operated by trained and qualified personnel in accordance with applicable and sound engineering principles?			
Firearms Safety	Are there established firearms safety policies and procedures for security operations and training to ensure proper accident prevention controls are in place?			
Industrial Hygiene	Does the industrial hygiene program require conducting initial or baseline surveys and periodic resurveys and/or exposure monitoring of all work areas or operations to identify and evaluate potential worker risk?			
	Is the program being managed and implemented by a professional and technically qualified industrial hygienist?			
	Does the program coordinate with planning and design personnel?			
	Does the program coordinate with occupational medicine, environmental, health physics and work-planning professionals?			
	Are there policies and procedures to mitigate the risk from identified and potential occupational carcinogens?			
Biological Safety	Is there an established biological safety program to address biological hazards?			

[1] These basic performance expectations should be supplemented by additional ones based on 10 CFR 851 requirements.
[2] If YES, identify specific site policy and guidance. If NO, ensure appropriate site policy and guidance is developed.

Table 1: 10 CFR 851 Performance Expectations *(Continued)*

Requirement	Performance Expectation[1]	Policy and Guidance Available[2]		
		Yes	No	N/A
Appendix A - Program Functional Areas *(Continued)*				
Occupational Medicine	Is there an established occupational medicine program, including written descriptions and plans for implementation?			
	Does the program address areas including occupational medical program qualifications and requirements, medical monitoring, medical restriction notification, evaluations of morbidity and mortality, health promotional programs, and emergency preparedness?			
Motor Vehicle Safety	Is there an established motor vehicle safety program to protect the safety and health of all drivers and passengers in Government-owned or leased motor vehicles and powered industrial equipment?			
Electrical Safety	Is there an established electrical safety program to ensure the safety and health of the workforce, enhance electrical safety awareness, and mitigate potential electrical hazards to employees?			
Nanotechnology Safety	Is there an established nanotechnology safety program consistent with DOE P 456.1, *Secretarial Policy Statement on Nanoscales Safety*, and DOE N 456.1, *The Safe Handling of Unbound Engineered Nanoparticles?*			

[1] These basic performance expectations should be supplemented by additional ones based on 10 CFR 851 requirements.
[2] If YES, identify specific site policy and guidance. If NO, ensure appropriate site policy and guidance is developed.



Points of Contact

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Appendix H – Pre-Task Hazard Analysis

PRE-TASK HAZARD ANALYSIS PROCESS

1.0 PURPOSE AND SCOPE

A. This procedure establishes requirements for preparing a Pre-Task Hazard Analysis (PTHA) for construction projects at the University of California's Lawrence Berkeley National Laboratory (LBNL).

B. Description: The PTHA is a task-driven process designed to ensure that every task receives proper safety planning prior to starting work. The PTHA shall become part of the daily work authorization for all work activities.

C. Intent: The PTHA is a task-and-time-specific process that supplements other processes in place to help foster safe, timely, and quality work at the jobsite. It shall be developed as a team effort by Subcontractor's work crew and superintendent before any task is begun. The intent is to systematically plan specific tasks to be conducted in a safe and effective manner. The PTHA does not replace procedures set forth in Subcontractor's site safety program, but reinforces particular aspects of safety pertaining to specific day's work.

2.0 RESPONSIBILITIES

A. Implementation of the PTHA process is the responsibility of Subcontractor's management and field teams and the University's project team. Authority to perform identified tasks may be delegated to other qualified personnel, but responsibility remains with those named above.

B. Subcontractor's Management Team: Subcontractor's management team (project manager and superintendent) is responsible for:

B.1 Ensuring adequate training in the PTHA process for all personnel working at the construction site.

B.2 Monitoring content of completed PTHA forms for quality and completeness.

B.3 Reporting PTHA worksheet content to the University on a monthly basis.

C. Subcontractor's Field Team (superintendent and work crew):

C.1 Subcontractor's Field Team (superintendent and work crew):

C.1.a Becoming knowledgeable of the PTHA process.

C.1.b Providing on-the-job training for Subcontractor's work crew.

C.1.c Conducting meetings at the start of each new task or shift to lead the work crew through the job-planning process and development of the PTHA worksheet.

C.1.d Documenting the PTHA using the attached worksheet.

C.2 Subcontractor's Work Crew: Subcontractor's work crew is responsible for:

C.2.a Becoming knowledgeable of the PTHA process.

C.2.b Completing necessary training in the PTHA process.

C.2.c Participating in preparation of the worksheet at the start of each new task or shift.

C.2.d Conducting work activities in accordance with the PTHA.

D. University Project Team (project manager, construction manager, and construction inspector:

D.1 The University's project manager is responsible for:

D.1.a Ensuring the project team members are trained in the PTHA process.

D.1.b Making provisions for adequate Subcontractor training and proper implementation of the PTHA process.

D.1.c Reviewing a sampling of Subcontractor's completed PTHA forms on a routine basis for appropriate content.

D.2 The University's construction manager is responsible for:

D.2.a Reviewing Subcontractor's completed PTHA worksheets for consistency and adequate coverage.

D.2.b Continuously monitoring the overall PTHA process for effectiveness and informing the project manager and other team members of its findings.

D.2.c Identifying any additional training needs for Subcontractor's superintendent or work crew.

D.3 The University's construction inspector is responsible for:

D.3.a Conducting training of Subcontractor personnel in the PTHA process.

D.3.b Field monitoring the PTHA process to assure Subcontractor's work crews comply with the PTHA requirements.

3.0 PROCEDURE

A. The sequence of action steps in the PTHA process and responsible individuals for each step are as described below.

B. Identify Work Area and Task: Generally, the work to be performed will be covered in Subcontractor's site-specific safety plan. The PTHA shall cover specific tasks to be performed within a shift in a particular work area. Note: A clear understanding of what the job entails from beginning to end is essential for an accurate and complete PTHA.

C. Develop a Safe Plan of Action: Subcontractor's work crew assigned to perform the work shall develop the PTHA during the PTHA meeting, with guidance from Subcontractor's superintendent. Subcontractor's superintendent shall lead the work crew as they plan their work for the shift and solicit their participation in identifying hazards and hazard control measures, such as personnel protective equipment (PPE), required training, permits, procedures, and like items.

D. Document PTHAs: Subcontractor's superintendent shall document PTHAs using the attached worksheet. Each member of Subcontractor's field team shall sign the completed worksheet. Signatures indicate the individuals have participated in development of the worksheet, understand the hazards, and agree to follow the completed worksheet. If Subcontractor's field team determines the scope of work and conditions have not changed from a previously completed PTHA, that PTHA may be reused. Subcontractor's field team shall, however, sign the PTHA worksheet each time it is used.

E. Conduct PTHA Meetings: At least daily, and whenever a task presents a change of hazards from tasks under the currently used PTHA, Subcontractor's superintendent shall conduct a PTHA meeting. This is a brief (generally not more than 10 minutes) safety meeting to discuss tasks to be conducted during the work shift. When a task is continued from a previous day, the PTHA meeting shall include a review of the current PTHA and consideration of any new hazards or conditions that could exist. The PTHA meeting may be combined with a "tool-box" meeting or "morning safety" meeting; however, the PTHA meeting shall include a review of the PTHA currently in effect, or development of a new worksheet, and sign-off by each worker and the superintendent as noted in paragraph C above.

F. Post Completed PTHA Worksheets: Subcontractor's superintendent shall post the completed worksheet immediately adjacent to the work area such that anyone may review the form throughout the work shift. In case of an incident, the PTHA shall be immediately evaluated for work conditions and procedures.

G. Retain Completed PTHA Worksheets: Subcontractor's superintendent shall retain all PTHA worksheets. Furnish signed and dated copies of all worksheets to the University's construction manager upon completion of the form and again at completion of the tasks described in the worksheet.

H. Review the PTHA Process: Subcontractor shall verify the content and quality of the PTHA worksheets completed by its employees and lower-tier subcontractors. The University's construction manager will utilize appropriate sampling techniques to monitor the quality of completed worksheets.

4.0 DOCUMENTATION

Each PTHA shall be documented using the attached form. Subcontractor shall retain hard copies of each worksheet for the duration of the activity. The University's construction manager will also retain a copy of all PTHA records.

END OF PRE-TASK HAZARD ANALYSIS (PTHA) PROCESS
(Checklist and sample worksheet follow.)

FACILITIES CAPITAL PROJECTS
SUBCONTRACTOR PRE-TASK HAZARD ANALYSIS WORKSHEET

Work Request #_____ **Task**_____ **Location of Task**_____ **Date** _____

MAJOR WORK STEPS OF TASK	POTENTIAL HAZARDS	CONTROLS / SAFETY PLAN	TOOLS REQUIRED

Task Specific Required Inspection	
Daily Lift Inspection	Inspected By/Name
Harness Inspection	Inspected By/Name
Fire Extinguisher Inspection Current	Inspected By/Name
Cords – Properly Inspected	Inspected By/Name
All Existing Systems Enabled	Inspected By/Name

Work Area Questions

Is there adjacent work and/or co-occupancy in work area? ___Yes ___No
Other workers adjacent above or below work area? ___Yes ___No
Did you notify them of your presence? ___Yes ___No
Did you coordinate with adjacent work? ___Yes ___No
Can you proceed with working safely? ___Yes ___No
Barricades Set Up ___Yes ___ No Removed at end of task ___Yes ___No

Pre-Task Review has been completed and each employee is taking the responsibility to ensure that all required training for this work activity is current, and that they are competent and qualified on all required tools/equipment – Print Name and Initial

_____ _____

_____ _____

_____ _____

_____ _____

Subcontractor Foreman/Superintendent Signature: **Date:**

Instructions: Complete this form per task, per day. **1.** Fill in work request number, task, location and date. **2**. List **major work steps** of this task. **3**. Using the back side of this form as a guide, walk-through the work area and list **potential hazards** involved with each work step. **4**. List controls or **safety plan** to mitigate those hazards. **5**. List **required tools** to perform the job safely. **6**. Have each worker review the work area; assist with completing this form and print name and initial. **NOTE**: Multi Craft jobs require each discipline to complete separate form for their task. Review with all workers in work area. Each worker prints name and initials on all worksheets. **7**. Submit a copy of this form to the Construction Manager at completion of day. **NOTE: Work shall STOP if conditions change, job scope changes, or a deficiency in the plan is noted. If any injuries or incidents occur, respond as appropriate, than contact the Construction Manager, Inspector, & Subcontract Administrator immediately** Rev 1 – 01/12/05

Permits/Required Reviews

- ☐ Construction Safety Video
- ☐ Soil/Concrete Permit Video (n/a)
- ☐ Facility Work Permit
- ☐ Asbestos Work
- ☐ Concrete Penetration/ Jack hammering Permit
- ☐ Confined Space
- ☐ Critical Lift
- ☐ Building Drain Work
- ☐ Excavation /Shoring Permit (Underground Location)
- ☐ Fire/Burning Permit
- ☐ Hoisting & Rigging
- ☐ Boom Proximity, Assembly/Brkdown
- ☐ Lead Abatement
- ☐ Lock Out/Tag Out
- ☐ Pneumatic Test
- ☐ Roof Access Permit
- ☐ Steel Erection/Decking/ Grating Plan
- ☐ Working Energized Circuits & Equipment
- ☐ Low Voltage Outage Permit

Required PPE

- ☐ Hard Hat/Correct Class
- ☐ Ear Plugs/Ear Muffs
- ☐ Eye Protection
  - Safety Glasses
  - Face Shield
  - Chemical Goggles
  - Welding Hood
- ☐ Hand Protection
  - Arm Sleeves
  - Cut-Resistant Gloves
  - Welders Gloves
  - Surgical Gloves
  - Rubber Gloves
  - Elect Insulated Gloves
  - Other _____
- ☐ Foot Protection
  - Sturdy Work Boots
  - Safety Toe Boots
  - Rubber Boots
  - Rubber Boots cover
  - Dielectric Footwear
- ☐ Respiratory Protection
- ☐ Special Clothing
  - Tyvek
  - Nomex III
  - Rain Suit
  - Safety Vest
  - Other _____
- ☐ Fall Protection
  - Harness
  - Double Lanyard
  - Tool Tethers
  - Anchorage Point
  - Retractable Device
  - Horizontal lifeline system
  - Fall Clearance Distance
  - Fall Rescue/Retrieval Plan

Hazards	Safety Plan
☐ Overhead Utilities	☐ De-energization req. ☐ Insulation blankets req. ☐ Wire watcher req. ☐ Req. clearance distance ☐ Safe work zone marked
☐ Crane or other Lifting Equipment Lifting, Rigging Objects	☐ Signalman assigned ☐ Tag lines in use ☐ Lifting equip inspected ☐ Area around crane barricaded ☐ Rigger Plan/Personal Protected
☐ Aerial Lift/Platform	☐ 100% Tie Off ☐ Daily Inspection ☐ Training Current ☐ Access Permit/Custodial Possession Placard
☐ Electrical	☐ Lock out/Tag out ☐ Required Permit ☐ Multi Energized source? ☐ Confirm equip is de-energized ☐ Review elect safety procedures
☐ Excavations	☐ Required Permit ☐ Inspect prior to entering ☐ Barricades ☐ Proper sloping/shoring ☐ Access/egress provided
☐ Fire Hazard = Cut, Weld, Burn, Grind, Solder	☐ Required Permit ☐ Fire Extinguishers ☐ Fire Watch ☐ Adjacent areas protected ☐ Unnecessary flammable material removed
☐ Vehicular Traffic and/or Heavy Equipment	☐ Traffic Barricades ☐ Cones ☐ Signs ☐ Flagman ☐ Lane closure ☐ Communication with equipment operator ☐ Surface condition
☐ Noise > 85 db	☐ Hearing protection is required ☐ Ear plugs/Muffs
☐ Hand & Power Tools	☐ Inspect general cond. ☐ Identified PPE required for each tool ☐ Review safety operation manual ☐ Guarding OK ☐ GFCI in use
☐ Hand Hazards	☐ Check for sharp tools, materials and equipment ☐ PPE gloves ☐ Protect sharp edges as necessary
☐ Manual Lifting	☐ Review proper lifting tech. ☐ Hand protection req ☐ Clear pathway ☐ Back support belts ☐ Identify material requiring lifting equip
☐ Ladders	☐ Inspect general cond before use ☐ Quarterly Ladder inspection ☐ Ladder tied off ☐ Proper angle/placement ☐ Review ladder safety
☐ Scaffolds	☐ Inspect general cond before use ☐ Tags in place & Properly secured ☐ Footings adequate ☐ Toe boards used ☐ Material properly stored
☐ Slips, Trips, Falls	☐ Inspect for trip hazards ☐ Extension cords properly secured ☐ Work zone free of debris ☐ Tools & Material properly stored
☐ Pinch Points Exposed (Rotating Equipment)	☐ Review area for potential pinch points or exposed rotation equipment ☐ Near operating equip? ☐ Hand/Body position ☐ Loose clothing?
☐ Working w/Chemicals	☐ The task creates potential for direct contact with hazardous chemicals ☐ Review MSDS ☐ Have proper containers & labels ☐ PPE
☐ Heat / Cold Stress Potential	☐ Heat stress monitoring (>85 degrees) ☐ Liquids available ☐ Cool down periods ☐ Sun Screen ☐ Review Heat/Cold stress
☐ Body Mechanics	☐ Proper clothing ☐ Wind chill (<32degrees) ☐ Warm up periods
☐ Environment (Endangered Species)	☐ Air emissions ☐ Water discharge ☐ Hazardous/other wastes ☐ Awareness of endangered Species and habitant area
☐ Natural or Site Hazards	☐ Weather ☐ Terrain ☐ Adjacent operations ☐ Biological hazards ☐ Animal/reptiles/insect hazards
☐ Barricades/Covers for Overhead Work	☐ Caution barricade tape required ☐ Danger barricade tape required ☐ Warning signs ☐ Cover over opening ☐ Rigid railing required
☐ Underground Utilities (Line Locating)	☐ Review as builts ☐ Subsurface surveys ☐ Received dig permit ☐ Required clearance distance ☐ Safe work zone marked ☐ Walk around
☐ Transporting Materials on Vehicle	☐ Tie down all loads ☐ Secure materials on racks ☐ Flag Ext Material
☐ Moving/Falling objects from height	☐ Tether small objects ☐ Use rope, canvas bag ☐ Barricade around potential fall area
☐ Pressurized gas hazard	☐ LOTO process ☐ Take care near small fragile lines
☐ Laser hazard/Beam path	☐ Stay outside of identified areas ☐ Proper laser eyewear
☐ O2 Deficiency, Argon hazard And/or Freon	☐ Observe signs ☐ Use O2 monitor ☐ Involve ESH Team ☐ Sniff before entry
☐ Wall/Ceiling Penetration	☐ Scan area where penetration will take place ☐ Perform Walk Around
☐ Magnetic Field Hazards	☐ No pacemakers, defibrillators ☐ Heed warning signs

General Construction Safety Requirements:

Note: the following subject areas are those most common to construction work conducted at LBNL and do not encompass all safety requirements that may apply. It is the responsibility of the subcontractor to read PUB-3000 and all contract documents.

Aerial Lifts and Scissor Lifts:

Aerial lifts and scissor lifts shall only be operated by personnel trained in the specific model and serial number of the lift being used. For aerial lifts, fall protection (fall restraint) shall be worn. For scissor lifts, fall protection (fall restraint) shall be work when the lift is equipped with a manufacturer-provided anchorage point. When fall restraint is worn, the lanyard shall be a 6 foot lanyard capable of being adjusted (shortened) to 3 feet. During movement of the lift, the lanyard shall be adjusted to 3 feet. An LBNL Fall Protection Matrix, or an LBNL approved subcontractor fall protection plan must be used to establish work controls. See also “Fall Protection”.

While parked in working position, the lanyard can be adjusted to 6 feet. Spotters are required when lifts are being used to provide emergency assistance. The spotter must be in sight or sound of the lift he or she is spotting for.

Lifts shall be inspected daily by a competent person.

LBNL Resources:
PUB-3000, Chapter 5, Section 5.2
PUB-3000, Chapter 30, Section 30.6, Work Process B

Cranes and Rigging:

Mobile cranes shall comply with California Code of Regulations (CCR) Title 8, General Industry Safety Orders, Article 93. Construction crane operations including assembly and disassembly shall comply with 29 Code of Federal Relations (CFR) 1926 Subpart CC. Unless approved by the LBNL Rigging Supervisor, rigging equipment and devices shall comply with American Society of Mechanical Engineers (ASME) B 30.26, have legible load rating markings that are traceable back to the manufacturer, and be made in the USA.

A Crane Lift Plan shall be submitted by the crane subcontractor to the Construction Manager and shall be approved prior to any crane operation. All crane operators shall have a valid license from an approved agency or union and meet the requirements of 29 CFR 1926 Subpart CC. All crane signal personnel must meet the signal-person requirements of 29 CFR Subpart CC. Training certificates must be issued by a third-party qualified evaluator, or the current employer’s qualified evaluator. All rigging personnel must meet the rigging Competent Person requirements of 29 CFR Subpart CC. All cranes shall be equipped with the following items: rated load capacities, wind load ratings, and special hazard warnings. All rigging equipment shall be inspected prior to each use, as well as weekly, with a copy of the weekly inspection report submitted to the LBNL Construction Manager. A detailed, step-by-step procedure in the form of an Engineering Note must be prepared for each high-consequence/high-value lift or move

LBNL Resources:
PUB-3000, Chapter 27
PUB 3000, Chapter 10, Appendix A.1

Chemical Use:

All subcontractors are solely responsible to comply with State and Federal OSHA Construction Hazard Communication requirements. This includes hazard assessment, employee training, container labeling, MSDS recordkeeping and notification procedures.

All subcontractors are to supply the LBNL Project Manager with a written copy of their Hazard Communication Program along with the MSDS of any chemical materials brought onto the job site. Providing MSDSs and employee training shall take place initially when the subcontractor comes onto the site and whenever new chemicals are used.

Subcontractor shall minimize or eliminate the acquisition, use, and release of toxic and hazardous materials and maximize the acquisition and use of environmentally preferable products. The Subcontractor shall submit to the LBNL Project Manager, for review by the LBNL EH&S Division, any proposed procurement, stocking, installing, or other use, handling, or disturbance of materials containing mercury, asbestos, cadmium, chromates, crystalline silica, or lead.

LBNL Resources:
PUB-3000, Chapter 10, Section 10.8

Confined Space Entry:

Pits, excavations, trenches, and other confined spaces entered by construction subcontractors will be managed under the requirements of the California Code of Regulations, Title 8, General Industry Safety Orders, Article 108, Section 5157. Access to permit-required confined spaces is prohibited until a permit has been issued for that entry. No entry will be allowed until an LBNL Construction Safety Engineer has verified that all permit requirements have been met.

See the Confined Space Program website: www.lbl.gov/ehs/ih/programs/confined_space.shtml.

LBNL Resources:
PUB-3000, Chapter 10, Appendix B.4
PUB-3000, Chapter 4, Section 4.9

Demolition:

The LBNL Project Manager is responsible for developing detailed Utility Isolation Plans on all demolition projects to include drawings of all electrical and mechanical work. The subcontractor shall be responsible for submitting a Job Hazard Analysis and all other work procedures to the LBNL Project Manager for review and approval a minimum of seven days prior to the start of demolition for each phase. Demolition work shall at all time be under the immediate supervision of a competent person with the authority to secure maximum safety for employees engaged in demolition work. All floor and wall openings, which pose a fall exposure, shall be protected by guardrails and/or covers. Entrances to multistory structures being demolished shall be completely protected by sidewalk sheds, canopies, or both.

LBNL Resources:
PUB-3000, Chapter 10, Appendix A.2
LBNL PUB 3000, Chapter 27

Disciplinary Program:

Violation of LBNL construction safety requirements will subject subcontractors and their employees to disciplinary action ranging from a verbal warning to revocation of site access privileges. The following guidelines may be used, or more severe disciplinary action taken, based on the degree of the infraction(s). The LBNL Project Team has sole authority to determine the type of disciplinary action to be taken.

- First offence – verbal warning with written record of the offence. Notice to subcontract employee's supervisor
- Second offence – written warning. Subcontract employee and supervisor attend mandatory meeting with the subcontractor Superintendent, LBNL Project Manager, LBNL Construction Manager, and LBNL Construction Safety Engineer to determine corrective action. A copy of the written warning is sent to the office of the subcontract employee

with a statement that if another violation occurs the worker will be removed from the project and consideration will be give to terminating the contract.

- Third offence – the worker is removed from the project. Consideration is given to terminating the contract.
- Multiple violations among employees of the same subcontractor – consideration will be given to removing the subcontractor Supervisor from the project and in terminating the subcontractor's contract.

LBNL Resources:
PUB-3000, Chapter 10, Section 10.13

Electrical Safety – General:

All 120-volt, single-phase, 15, 20, and 30 ampere receptacles shall be protected by approved GFCIs. Other receptacles shall be protected by an approved GFCI, or through a written "Assured Equipment Grounding Conductor" program. This program shall be approved by LBNL electrical safety, and include a component that ensures continuous enforcement at the site. All subcontractors shall have a system in place for routine testing and maintenance of electrical tools, equipment and extension cords (equipment). Damaged equipment shall be removed from the project. All electrical equipment (such as saws, hammers, drills, vibrators, and float machines) shall bear the label of a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories (UL), CSA, or ETL. All tools shall be of the grounding type. Cord-connected tools shall be grounded through an approved grounding attachment plug. Exception: Tools identified as "Double Insulated" are not required to be grounded. Only heavy-duty cords identified as hard or extra-hard usage (see NEC Table 400.4) (such as types S, ST, SO, STO) are acceptable. Cords shall be maintained in their original designed configuration. Any cord that is damaged or has a grounding pin removed shall be removed from service.

Safe clearance distances shall be maintained from overhead electrical lines. It is the responsibility of the subcontractor performing to ensure overhead electrical lines are de-energized, blanketed, or protected against accidental contact by other means.

LBNL Resources:
PUB-3000, Chapter 10, Section 10.18, Appendix A.3

Electrical Safety – Energized Electrical Work:

Any activity within 42 inches of an uninsulated hazardous energized conductor greater than 50V is defined as energized electrical work. Energized electrical work by subcontractors is generally not permitted. On rare occasions, exceptions are authorized through an Energized Electrical Work Permit (EEWP) unless the work involves testing, troubleshooting, or lockout/tagout verification. Subcontractors working with potentially hazardous electrical exposure must complete a Subcontractor Electrical Safety Workbook and an Energized Electrical Work Permit (EEWP).

Permit: No subcontractor employee shall be within the Limited Approach Boundary of an energized electrical conductor (minimum 42 inches from an energized electrical part with a voltage greater than 50V) without first obtaining an approved EEWP. You can obtain an EEWP online, at http://electricalsafety.lbl.gov. Do not open covers on energized equipment without first obtaining an EEWP

Subcontractors must follow all safety requirements found in PUB-3000, Chapter 8, Section 8.14, Appendix S: "Subcontractors and Vendors: What You Need to Know About Performing Electrical Work and Lockout/Tag out at Lawrence Berkeley National Laboratory".

LBNL Resources:
PUB-3000, Chapter 8
PUB-3000, Chapter 8, Section 8.14, Appendix A

PUB-3000, Chapter 8, Section 8.14, Appendix B
PUB-3000, Chapter 8, Section 8.14, Appendix S

Electrical Safety – Lockout/Tagout (LOTO):

LOTO is performed to prevent a worker from being injured by the accidental release of energy. LOTO applies to all energy sources including mechanical, thermal, pressure, chemical, and rotational, not just electrical. Equipment must be de-energized and isolated from all hazardous energy sources before work begins. All workers who are working on that equipment are required to have control over the energy with a personal lock and tag.

Each LOTO of equipment, utilities, systems, etc., requires a LOTO Permit. This is true when the subcontractor is working independently, and when LBNL employees are assisting with the LOTO.

Permit: No subcontractor employee shall apply a lock or tag to any circuit or equipment without first obtaining an approved LOTO permit. You can obtain a LOTO permit online at http://electricalsafety.lbl.gov. Do not work on de-energized equipment without a LOTO permit.

Subcontractors must follow all safety requirements found in PUB-3000, Chapter 18, Section 18.19.6, Appendix 6: "Subcontractors and Vendors: What You Need to Know About Performing Electrical Work and Lockout/Tag out at Lawrence Berkeley National Laboratory".

LBNL Resources:
PUB-3000, Chapter 18
PUB-3000, Chapter 18, Section 18.19.6, Appendix 6

Excavation & Trenching:

All excavation and trenching work requires an LBNL Penetration Permit. Subcontractors must obtain the permit through the LBNL Construction Manager a minimum of 10 days prior to the start of work. Excavation or trenching work may not proceed an approved and signed Penetration Permit is on site and a pre-start inspection and briefing has been conducted. Permits must be posted in a conspicuous place at the job or project site. An excavation and trenching Competent Person shall be on site during all operations relating to an open excavation.

Excavation & trenching requirements include:

- Soil classification must be performed by the Competent Person, and appropriate hazard controls implemented, before subcontractors are allowed in an excavation.
- A Cal/OSHA T1 Annual Trench/Excavation permit must be obtained before subcontractors are allowed within 5 feet or more of the excavation.
- Fall protection is required for excavations deeper than 4 feet.
- An exit ramp or ladder is required within 25 feet of every worker for trenches deeper than 4 feet.
- A trench protection system (slope, bench, shoring, shielding) is required when the trench is deeper than 5 feet.
- A Registered Professional Engineer (hired by the subcontractor) shall design all shoring, sloping, or benching for excavations deeper than 20 feet.
- Emergency rescue equipment shall be on site and readily available by the subcontractor.
- The Competent Person shall inspect the excavation throughout the work period and stop operations when unsafe conditions exist.

LBNL Resources:
PUB-3000, Chapter 10, Appendix A.5

Fall Protection:

Fall protection is required under the following conditions:

1. Any work task on a walking/working surface with an unprotected side or edge that is 6 feet or more above a lower level.
2. Any work task on an aerial lift (including a scissors lift only if an engineered anchor point is provided by the manufacturer) when working above the protection system at floor openings, unprotected perimeters higher than 6 feet, and whenever a fall of more than 6 feet could occur.
3. Any work task by steel erectors and sheet metal installers above 6 feet.
4. Any use of a portable ladder when working above 6 feet or above the third rung (from the top of the ladder).
5. Any use of a portable ladder when working above 6 feet and below the third rung when the user cannot maintain three-point contact (consisting of two feet and one hand) at all times.

Fall protection may include passive (guardrails, fall restraint) or active (fall arrest) systems.

All work requiring fall protection shall be approved by a Fall Protection Competent Person either through an LBNL approved subcontractor fall protection program or through LBNL's Fall Protection Matrix.

LBNL Resources:

PUB-3000, Chapter 30
PUB-3000, Chapter 30, Work Process R
PUB-3000, Chapter 10, Section 10.18, Appendix A.6

Floor & Roof Openings:

Floor and roof openings shall be protected by a standard railing or cover. All skylights shall be protected in the same manner. Covers shall support without failure at least twice the weight of the subcontractors, equipment, and materials that may be imposed on the cover at any one time. All covers shall be secured so as to prevent displacement. All covers shall be color coded or marked with the words "hole" or "cover."

LBNL Resources:

PUB 3000, Chapter 10, Appendix A.20

Hearing Protection:

Subcontractors are responsible for identifying high noise work tasks, and for providing required Dosimetry, hearing protective devices and training for their employees.

Warning signs stating "High Noise Area - Hearing Protection Required" is required to be posted by the subcontractor on the periphery of all work areas where hearing protection is required.

LBNL Resources:

PUB 3000, Chapter 10, Appendix A.11

Heat Related Illness Prevention:

The Subcontractor shall provide protection against heat related illness as follows:

- Provide and maintain continuous natural or artificial shade when outdoor air temperature exceeds 85 degrees F and upon request when below 85 degrees F.
- Implement high heat procedures when the outdoor air temperature exceeds 95 degrees F.

- Provide Heat Illness and Prevention Procedures upon request or as part of subcontractor's health and safety plan.
- Provide effective training per Title 8, Section 3395 to each employee and their supervisors.

LBNL Resources:
Cal/OSHA Division 8, Chapter 4, Subchapter 7, Group 2, Article 10, Section 3395

House Keeping:

The staging or storing of material shall not create hazards. Bags, bundles, and other containers or materials must be stacked, blocked, interlocked, and limited in height so that they do not slide or collapse. Subcontractor storage areas must be kept free from the accumulation of materials that may cause tripping, fire, or harboring of rats and other pests. During the course of construction, alteration, or repair, form and scrap lumber with protruding nails and all other debris shall be kept reasonably cleared from work areas, passageways and stairs in and around buildings or other structures. Subcontractors are solely responsible for the cleanup of their immediate work areas on a daily basis

Appropriate containers shall be provided for the collection and separation of waste, trash, oily and used rags, and other refuse. All dumpsters in use shall have unobstructed access. Containers shall be disposed of daily.

LBNL Resources:
PUB-3000, Chapter 10, Section 10.18, Appendix A.11

Illumination:

Construction areas, aisles, stairs, ramps runways, corridors, offices, shops, and storage areas where work is in progress shall be lighted with either natural or artificial illumination.

While work is in progress, such areas shall be lighted to not less than the minimum illumination intensities (in Foot-Candles) prescribed by the following Table.

Minimum Illumination Intensities In Foot-Candles

Foot-Candles	*Area or Operation*
3.....	General construction area lighting low activity.
5.....	Outdoor active construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.
5.....	Indoors: warehouses, corridors, hallways, stairways, and exit-ways.
10.....	General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active storerooms, barracks or living quarters, locker or dressing rooms, mess halls and indoor toilets and workrooms).
10.....	Nighttime highway construction work.
30.....	First-aid stations, infirmaries, and offices.

LBNL Resources:
Cal/OSHA Division 8, Chapter 4, Subchapter 4, Article 3, Section 1523

Job Site Inspections:

During periods of active work, project field supervisors and subcontractors' safety representatives must perform daily inspections of the operations, materials, and equipment on their projects; identify hazards; and take corrective actions to eliminate them. If immediate corrective action is not possible, they must notify affected workers, post warning signs, and take interim control measures. All inspections, findings, and corrective measures must be documented and be available for review by the LBNL Construction Safety Engineer.

LBNL Resources:

LBNL Facilities Master Specifications, Environment, Safety, and Health Procedures, 013529, Section 1.10

Ladder and Stair Requirements:

A stairway or ladder shall be provided at all personnel points of access where there is a break in elevation of 19 inches or more, and no ramp, runway, sloped embankment, or personnel hoist is provided. All ladders brought onto the job site or built on the job must meet all ANSI, OSHA, and Cal/OSHA requirements.

Ladders shall be inspected daily by the subcontractor's Competent Person. Defective ladders shall immediately be withdrawn from service and tagged to prevent use, or destroyed. Portable ladders shall be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is about one-quarter of the working length of the ladder (the length along the ladder between the foot and the top support). Ladders shall not be used in a horizontal position as platforms, runways or scaffolds. Extension ladders and side rails shall extend to least 36 inches above the landing.

When working from step ladders above 6 feet, employees must maintain 3 points of contact or be provided with fall protection (or work from platform ladders).

LBNL Resources:

PUB-3000, Chapter 10, Section 10.18, Appendix A.12

Material Handing:

Employees must not be required to lift heavy or bulky objects that might overtax them physically. The mechanical devices must be appropriate for the lifting or moving task and must be operated only by personnel trained and authorized to operate them. All hoists, cranes, and secondary support equipment used at the Laboratory must be certified and approved by an appropriate engineer.

LBNL Resources:

LBNL PUB 3000, Chapter 10, Appendix A, Section A.14

Material Safety Data Sheet (MSDS):

See “Chemical Use”

Personnel Protective Equipment (PPE):

Each subcontractor is responsible for providing proper personal protective devices to their employees. PPE requirements shall be posted at the main entrance to the job site. All subcontractors and visitors shall wear hardhats and eye protection (with side shields) 100% of the time while on the job site. Face shields shall be worn for protection from flying particles produced by drilling, breaking, chipping, and power saws. Adapters for use with hard hats or caps are required.

Shaded glasses or face shields (shade 7, 8, 9 or darker) shall be worn by subcontractors engaged in oxy-acetylene burning and welding. All subcontractors engaged in electric or arc welding shall use welding masks and hoods. Subcontractors shall consult suppliers for the exact shade to match the amperage tube used. All subcontractor employees working with metal studs, sheet metal, metal decking, ceiling grid, and cleanup or housekeeping activities will be required to wear cut-resistant gloves.

Subcontractor shall provide employees potentially exposed to dust, fumes, and/or gases with proper respiratory protection. The subcontractor is solely responsible for the proper fit testing, training, and maintenance per Cal/OSHA and Federal OSHA standards.

Subcontractor employees shall wear foot guards when working with soil tampers or where falling objects could occur. Thin sheet steel insoles are available to protect against nail punctures during stripping operations. All personnel shall wear sturdy work boots with durable sidewalls, toes, and soles. Visitors shall wear appropriate sturdy shoes or be kept out of the construction area. Metatarsal guards will be required when chipping concrete or asphalt.

All personnel shall wear shirts and long trousers to protect against the elements and work-site hazards. No sleeveless shirts, tank tops, mesh shirts, short, or sweatpants will be permitted. Sleeves shall extend a minimum of 4 inches from the top of the shoulder. Special clothing is required when working in very hot, cold, or wet workplaces, or when working with some chemicals, such as alkalis.

LBNL Resources:
PUB-3000, Chapter 10, Appendix A, Section A.19

Plan of the Day (POD) Safety Briefings:

A daily Plan of the Day (POD) safety briefing shall be conducted by the Subcontractor health and safety representative, superintendent, or work crew foreman for all employees on the work site.

The objective of the POD safety briefing is for the Subcontractor to communicate LBNL's expectations regarding safety to their employees. The LBNL Safety Briefing Manual includes instructions and a set of safety briefings that shall be used as a guideline for conducting POD safety briefings. A record of POD safety briefings shall be maintained by the Subcontractor on the work site and shall include the date, time, and names of employees in attendance, and subjects discussed.

A pre-task hazard analysis (PTHA) shall be completed and reviewed during the POD safety briefing. The PTHA is a discussion of tasks to be performed that day, the hazards associated with those tasks, and the controls required to safety perform the work.

LBNL Resources:
LBNL Facilities Master Specifications, Environment, Safety, and Health Procedures, 013529, Section 1.11

Powder-Actuated Fastening Tools:

Only low velocity powder-actuated fastening tools shall be used. The stud, pin, or fastener of these tools shall limit velocity not to exceed 300 feet per second.

The use of powder-actuated fastening tools shall be governed by the following rules:

- Tools shall meet requirements of the latest edition of ANSI A10.3.
- Only subcontractor employees qualified by instructions of the manufacturer's qualified representative and/or licensed by the state or local authorities shall be assigned to use a Powder Actuated Fastening Tool. All qualified employees shall carry proof of training by way of a training identification card at all times.
- Only cartridges and fasteners supplied by the manufacturer of the tool shall be used.
- Powder Actuated Fastening Tools shall be handled with the same care as firearms.
- All safety devices incorporated in the tool by the manufacturer shall be used at all times.
- A sign, minimum 8-in. x 10-in. with 1-in. letters, stating "Powder Actuated Tool in Use" or equivalent shall be posted by the Contractor in area of use. (ANSI A10.3)
- All used and unspent cartridges shall be properly disposed of per manufacturer's recommendations.

LBNL Resources:
PUB-3000, Chapter 10, Appendix A, Section A.19

Radiation Safety Training:

All Subcontractor personnel are required to complete the LBNL on-line General Employee Radiological Training (GERT) program.

In addition, work activities in areas that are controlled for radiological hazards will be managed according to LBNL's Radiation Protection Program, as implemented through a Radiological Work Authorization (RWA) and/or Radiological Work Permit (RWP). These documents will specify radiation safety controls, dosimeter requirements, and the level of required training based on scope of work and likely radiological hazards.

LBNL Resources:

LBNL Facilities Master Specifications, Environment, Safety, and Health Procedures, 013529, Section 1.18

Rebar Protection:

Subcontractors are not permitted to work above vertical protruding reinforcing steel unless it has been protected to eliminate the hazard of impalement.

Several approved methods to protect against this hazard are:

- Empty steel drums placed over the dowels until the column reinforcing is placed. The drums are then moved forward as the work progresses.
- Shallow boxes made from scrap lumber used in the same manner as No. 1 above.
- Plank covers for rows of bond bars.
- 4" x 4" x 4" wood blocks drilled to bar size and used as No. 4 above.
- Troughs or continuous 2"x4" wood rail secured to avoid displacement.
- Cal/OSHA approved, steel-lined, flat-head rebar caps.

Wire mesh or reinforcing bars extending beyond a section of slab in place shall be bent down and secured to eliminate a tripping hazard. Otherwise, subcontractors shall be prohibited from walking over the area.

LBNL Resources:

PUB-3000, Chapter 10, Appendix A.22

Roof Access:

Access to many roofs at LBNL is controlled, due to potential hazards from roof exhausts and research activities on lower floors. LBNL Building Mangers must be notified prior to access. Secure approval to work on roofs from LBNL's Project Manager prior to any work performed.

LBNL Resources:

LBNL PUB 3000, Chapter 4, Section 4.10

Scaffolds:

All scaffolds, whether fabricated on site, purchased, or rented, must conform to the following:

- All scaffolds are to be built under the direct supervision of a Competent Person.
- Guard-rails and toe-boards must be installed on all open sides and ends of scaffolds and platforms more than 6 ft above the ground or floor.
- Scaffolds 4 to 10 feet in height having a minimum horizontal dimension in either direction of less than 45 inches must have standard railing installed on all open sides and ends of the platform.
- All scaffolds are to be inspected daily by a Competent Person. Everyone using the scaffolds shall be trained in scaffold safety.
- All rolling scaffolds shall have the wheels locked while the scaffold is in use.

- Tubular welded rolling scaffolds require a horizontal/diagonal brace.
- Properly secured ladder access shall be provided for all scaffolds.
- Scaffolds shall be secured to the structure when the scaffold height is four times the minimum base dimension and every 26 feet thereafter.

During scaffold erection and dismantling, the designated Scaffold Competent Person overseeing the operation shall determine the feasibility of fall protection. If it is deemed that fall protection is infeasible, the Scaffold Competent Person shall develop a written fall protection plan that meets the requirements of Fed OSHA scaffold requirements, 1926.452(g)(2). The written plan shall be submitted to the LBNL Project Management for review prior to commencing the operation.

LBNL Resources:
PUB-3000, Chapter 10, Appendix A.22

Silica:

Subcontractor shall provide all necessary control measures at the work site to keep worker exposure to crystalline silica dust within the TLV established by the American Conference of Governmental Industrial Hygienists (ACGIH). Dust control measures may require spraying of water or engineering controls at the dust generating points. It also may include the use of NIOSH approved respirators, disposable coveralls to protect personal or work clothing, industrial grade HEPA vacuums, and HEPA filtered locally exhausted tools.

Examples of construction/demolition operations known to cause the release of silica dusts include, but are not limited to:

- Chipping, sawing, grinding, hammering, or drilling of concrete, rock, or brick that also incorporates wet methods (e.g., floor or wall slab cutting using mechanical means and water).
- Work with cementitious materials or other products that may contain silica such as grout, mortar, stucco, gunnite, plaster, sheetrock joint/taping compound, etc.
- Dry sweeping or sanding of materials that generate dust originating from concrete/cement, rock, or sheetrock joint/taping compound.

The subcontractor is responsible for conducting exposure monitoring to ensure employees and lower tier subcontractor employees are not overexposed to crystalline silica.

Abrasive blasting with sand is not permitted. Vacuum blasting with an abrasive blasting agent that contains <1.0% crystalline silica, or other equivalent method, that effectively prevents the controlled release of airborne silica is required to prevent employee exposures above the TLV for crystalline silica.

LBNL Resources:
PUB-3000, Chapter 10, Appendix B.10
LBNL Facilities Master Specifications, Environment, Safety, and Health Procedures, 013529, Section 1.18(C)

Storm Water Pollution Prevention:

To reduce or eliminate storm water pollution, Subcontractors are required to maintain an effective and appropriate storm water drainage control system. Subcontractors must:

- Provide effective soils erosion and sediment control.
- Ensure that no water other than storm water enters the storm water drainage system. During testing of fire hydrants and risers, or during an incident in which a sewage or water supply pipe has broken, the Subcontractor will have dechlorination tablets available and employ them to prevent domestic water with chloramines from being discharged to the storm sewer system.
- Collect, monitor, and properly dispose of all non–storm water.

- Identify all operations that could cause contamination of storm waters, and take appropriate corrective measures.
- Train key personnel in storm water Best Management Practices and proper techniques for spill containment and cleanup aimed at protecting the LBNL's storm drains.

LBNL Resources:

LBNL Facilities Master Specifications, Environment, Safety, and Health Procedures, 013529, Section 1.15

LBNL PUB 3000, Chapter 1, Section 11.3.12.

Stop Work Order:

A stop work order must be given when imminent danger is identified or where significant damage to equipment or property or environmental degradation could occur if the operation continued. When a stop work order is issued, only those areas of a construction project immediately involved in the identified hazardous situation are to be included in the order.

Any employee that observes an imminent-danger situation is responsible for stopping the work and reporting it to the subcontractor representative at the work site.

- Immediately after stopping work, the person issuing the order must report to LBNL Project Management or the LBNL Construction Safety Engineer of his/her action.
- LBNL Project Management or the LBNL Construction Safety Engineer will be dispatched to the site to verify that the operation has stopped and that the stop order was exercised in a justifiable and responsible manner.

Work cannot restart until the LBNL Project Management has agreed that the imminent danger has been eliminated. Notification to restart work will be passed to the construction subcontractor by the LBNL Project Manager.

LBNL Resources:

PUB-3000, Chapter 10, Section 10.13

Traffic Control:

A flagger or flaggers shall be utilized at locations on a construction site where barricades and warning signs cannot control the moving traffic. Subcontractors are solely responsible for traffic control when operations are such that signs, signals, and barricades do not provide adequate worker protection from vehicle traffic.

The number of flaggers required, and requirements for the deployment of the flagger or flaggers shall be according to Cal/OSHA Construction Safety Orders 1599(f) and 1599(g) and the California Manual on Uniform Traffic Control Devices for Streets and Highways, September 26, 2006.

LBNL Resources:

PUB-3000, Chapter 10, Appendix A.24

California Manual on Uniform Traffic Control Devices, September 26, 2006

Trenching:

See: "Excavation & Trenching".

Walking & Working Surfaces:

Work area floors must be clean and dry as much as possible. Drainage mats, platforms, or false floors should be used where wet processes are performed. Floors must be free from protruding nails, splinters, holes, and loose boards or tiles. Permanent aisles or passageways must be marked. Floor holes must be protected by covers that leave no openings more than 1 inch wide.

Floor openings (including skylights) into which persons can accidentally walk must be covered, guarded by standard railings and toe-boards, or provided with protective screens capable of supporting at least twice the weight of a worker, equipment, and materials, or a minimum of 400 pounds. All covers shall be color coded or marked with the words "hole" or "cover".

Open-sided floors, platforms, and runways higher than 6 feet must be guarded by standard railings or workers provided with fall protection. Toe-boards must be used wherever people can pass below or when hazardous equipment or materials are below.

LBNL Resources:
PUB-3000, Chapter 10, Appendix A.21

Waste Management:

Subcontractors must comply with LBNL's Waste Management policy:

- Comply with all laws and regulations governing hazardous, radioactive, mixed, and medical/bio-hazardous wastes.
- Remove these wastes from generator areas safely and efficiently.
- Minimize the wastes generated at Berkeley Lab.

LBNL Resources:
PUB-3000, Chapter 10, Appendix A.21

Work Place Violence:

It is the policy of the Laboratory to create and maintain a community in which we can work together in an atmosphere of respect and civility, free of harassing and threatening behaviors. Laboratory policies are designed to protect and promote the rights of members of the Berkeley Lab community and to prevent actions that interfere with those rights and with the Laboratory's mission.

Any threat or violent act will be considered serious misconduct and may be the basis for disciplinary action (including revocation of access privileges). Such an act may be reported to local law enforcement officials for appropriate action.