

SECTION 013529 – ENVIRONMENT, SAFETY, AND HEALTH PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Related Documents:

1. Drawings and general provisions of the Subcontract apply to this Section.
2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes:

1. Subcontractor shall provide in the performance of the work under this Subcontract all labor, materials, equipment, services, and supervision required to maintain work sites that meet the environment, safety, and health (ES&H) requirements of all applicable federal, state, local, and LBNL regulations, and LBNL policies to protect the environment and the safety and health of its employees, the employees of its lower tier subcontractors, LBNL employees, and the general public.

C. Related Sections:

1. Division 01 Section "General Requirements."
2. Division 01 Section "Special Procedures."

1.2 REFERENCES

A. General:

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

B. Subcontractors shall comply with requirements, which are applicable to the LBNL site, from the following citations or agencies:

1. Lawrence Berkeley National Laboratory's Health and Safety Manual, PUB-3000 (<http://www.lbl.gov/ehs/pub3000/pub3000c.html>) – in particular, Chapter 10, Construction Safety.
2. 10 CFR 830, Nuclear Safety Management
3. 10 CFR 835, Occupational Radiation Protection.
4. 10 CFR 851, Worker Safety and Health Program.
5. Occupational Safety and Health Act (OSHA).
6. 29 CFR Part 1910, Occupational Safety and Health Standards, Department of Labor.
7. 29 CFR Part 1926, Safety and Health Regulations for Construction, Department of Labor.
8. Fall Protection ANSI Z359-2007.
9. California Fire Code (2010 edition).
10. National Electrical Safety Code, ANSI C2.
11. National Fire Protection Association (NFPA) 51B, Fire Prevention During Welding, Cutting, and Other Hot Work (2009 edition).
12. NFPA 70E 2009, Standards for Electrical Safety in the Workplace.
13. NFPA 241, Safeguarding Construction, Alteration, and Demolition Operations (2009 edition).
14. California Code of Regulations: Title 8, Division 1, Chapter 4, Industrial Safety; Title 13, Division 2, Chapter 6, Hazardous Materials for Transportation by Commercial Carriers; Title 17, Division 3, Air Resources; Title 19, Public Safety; Title 22, Divisions 4 and 4.5, Hazardous Waste; Title 23, Division 3, Water Quality; Title 23, Division 5, Hazardous Materials.

15. 40 CFR Parts 122 through 125, National Pollutant Discharge Elimination System (i.e., water quality). California's General Permit for *Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit), as specified in the State Water Resources Control Board (SWRCB) Order No. 2009-0009-DWQ and California's General Permit for *Storm Water Discharges Associated with Industrial Activities excluding Construction Activities*, as specified in the SWRCB Order No. 97-03-DWQ.
16. 40 CFR Part 763, Asbestos.
17. Clean Air Act.
18. Clean Water Act.
19. Resource Conservation and Recovery Act.
20. Toxic Substances Control Act.
21. Bay Area Air Quality Management District (BAAQMD) Rules, Regulations, and Manual of Procedures, including Diesel Vehicle Idling Rules, On- and Off-Road Diesel Vehicle Regulations, and CEQA Guidelines.
22. California Department of Public Health.
23. East Bay Municipal Utility District Ordinances.

1.3 SUBCONTRACTOR ONSITE HEALTH AND SAFETY PROFESSIONAL AND ALTERNATE SITE HEALTH AND SAFETY REPRESENTATIVE

A. At the discretion of LBNL project management, the Subcontractor shall provide either a full time onsite health and safety professional or a full time onsite health and safety representative. The skill and qualification level of the required health and safety oversight will be based on the size and nature of the project and the anticipated EHS hazards. The health and safety professional and the health and safety representative shall have the authority to enforce all of the safety requirements of this Subcontract and implement the Subcontractor's Injury and Illness Prevention Program and Hazard Abatement Plans. If the health and safety professional or the health and safety representative is not qualified to conduct the inspection and monitoring requirements associated with specialized activities (such as work defined in Division 02 Specifications, Section "Lead Remediation" and Section "Asbestos Abatement"), the Subcontractor shall engage the services of a qualified professional (i.e., certified industrial hygienist, certified asbestos consultant) to perform the specialized duties. In addition to above health and safety professional, a Certified Health Physicist, or Radiation Safety Professional as approved by LBNL's Radiological Control Manager, may be required to implement Occupational Radiation Protection program elements when applicable.

1. Subcontractor shall submit the following documentation, for review and acceptance by LBNL project management, in support of the proposed onsite health and safety professional.
 - a. Evidence to support the safety and health certifications that may be required, including Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH), Construction Health & Safety Technician (CHST) or other certifications identified in 1.3 A above.
 - b. Evidence of experience in the management of safety and health at active construction sites of similar work scope to that of this Subcontract. Minimum requirement is five (5) years of verifiable work experience in construction safety.
 - c. Résumé detailing construction health and safety experience and education, including: college curriculum courses, OSHA Training Institute, professional development courses and seminars, environmental protection training, and other courses which have contributed to safety knowledge.
 - d. Listing of construction health and safety training courses conducted.
 - e. Proof of Competent Person or Qualified Person status applicable per the requirements of the project.
 - f. Evidence of industrial hygiene experience in the management of occupational health hazards including chemical exposures from construction products, silica hazards, noise, etc.
 - g. Evidence of the ability to provide a continuous presence, conduct routine inspections, industrial hygiene exposure assessments including personal and area air sampling for chemical and physical hazards, and be present to oversee the start of new work activities or activities involving unique hazards (i.e., critical lifts, lead and asbestos abatement, silica tasks, chemical product use, excavations, etc.),
2. Subcontractor shall submit the following documentation, for review and acceptance by LBNL project management, in support of the proposed safety and health representative:
 - a. Evidence to support the construction safety and health training that may be required, such as the OSHA 10-Hour and OSHA 30-Hour training, or equivalent.

- b. Résumé detailing work experience, construction safety education and health and safety responsibilities on projects of similar scope to this Subcontract.
 - c. Proof of Competent Person or Qualified Person status applicable per the requirements of the project.
 - d. Evidence of industrial hygiene experience in the management of occupational health hazards including chemical exposures from construction products, silica hazards, noise, etc.
3. The Subcontractor shall provide an alternate onsite health and safety representative, of commensurate qualifications, to assist the health and safety professional or the health and safety representative and act on their behalf when not present on site.
4. Subcontractor shall submit the following documentation, for review and acceptance by the University, in support of the proposed Certified Health Physicist, or Radiation Safety Professional (when applicable):
- a. Evidence of professional experience in the management of radiation safety at active construction sites of similar work scope to that of this Subcontract. Minimum requirement is five (5) years of verifiable work experience in radiation safety.
 - b. Résumé detailing education, including: college curriculum courses, radiation safety training and certifications, professional development courses and seminars, and other courses which have contributed to radiation safety knowledge base.
- B. The Subcontractor shall remove and replace its health and safety representative at the request of the LBNL Project Manager, if the safety representative is unsuccessful in enforcing the safety and occupational health requirements of this Subcontract and maintaining hazard free worksites.

1.4 SUBCONTRACTOR INJURY AND ILLNESS PREVENTION PROGRAM

- A. Subcontractor shall submit for review and acceptance their company's California Injury and Illness Prevention Program (IIPP).
- B. The Subcontractor shall also prepare a written comprehensive Site Specific Safety Plan (SSSP) that effectively integrates the site specific safety plans of all lower tier subcontractors and submit it to the LBNL Project Manager for review and acceptance by the University. The purpose of the SSSP is to describe means and methods for ensuring compliance with this Subcontract's specified ES&H standards and regulations. Field activities shall not start on this project until the LBNL Project Manager has favorably reviewed and accepted the SSSP. Subsequent revisions shall be submitted to the LBNL Project Manager for review prior to commencement of affected work.
- C. The required Site Specific Safety Plan shall include but not be limited to:
1. Names and Phone Numbers of on-site personnel
 - a. Project Manager
 - b. Construction Manager
 - c. Project Foreman
 - d. Site Safety Professional and/or Representative
 - e. Radiation Safety Professional (when applicable)
 2. Name and résumé for all persons responsible for the implementation of the Safety and Health Plan.
 3. Name and résumé for all persons listed by the Subcontractor who will be overseeing those tasks in which OSHA requires a Competent Person and/or Qualified Person.
 4. Names of personnel on-site having a current First Aid/CPR card.
 5. Company policy statement on Environment, Safety, and Health.
 6. Company policy statement on Substance Abuse and Testing Procedures.
 7. Company policy statement on Disciplinary Procedures.
 8. Company site specific Code of Safe Practices.
 9. Company site specific Emergency Evacuation Plan.
 10. Company site specific First Aid Procedures.
 11. Company site specific Incident Reporting Procedures.
 12. Company site specific Incentive Policy.
 13. List when and where Tool Box meetings are to be held.
 14. Document that all training and certification records for those working on the project will be reviewed and current prior to the start of work, and outline procedures to verify training and certification remains current throughout the length of the project.

15. Document how Site Specific Safety Inspection will be conducted.
16. Worker involvement in the identification or analysis of hazards through Plan of the Day meetings.

1.5 JOB HAZARD ANALYSIS (JHA) AND HAZARD ABATEMENT PLAN

- A. In addition to the IIPP/SSSP and/or Safety Checklist, the Subcontractor shall prepare and submit for review by the LBNL Project Manager a written Job Hazard Analysis for each phase of construction in this Subcontract. The Job Hazard Analysis shall provide the following information:

1. Description of work phase or activity.
2. Identification of potential hazards associated with the activity.
3. A list of the Subcontractor's planned controls to mitigate the identified hazards.
4. Name of the Subcontractor's employee responsible for inspecting the activity and ensuring that all proposed safety measures are followed.

JHA templates can be found on the LBNL EH&S Construction Subcontractor Safety Assurance web site (<http://www.lbl.gov/ehs/ssa/cssa/index.shtml>).

- B. The JHA shall also include those activities for which a subsequent Job Hazard Analysis, written plan or procedure will be required such as, but not limited to, the following:

1. Excavation and trenching
2. Demolition
3. Traffic control
4. Utilities shut Down
5. Electrical
6. Fall protection
7. Concrete placement and false work
8. Crane inspection, maintenance, and certification of heavy equipment, cranes, and motor vehicles
9. Fire protection and prevention
10. Steel erection
11. Roof work (repair, installation)
12. Roof work (non-roofers)
13. Working on hilly terrain
14. Hazard communications
15. Working with epoxy coatings
16. Confined space entry
17. Welding procedures
18. Lead hazard
19. Asbestos hazard
20. Painting hazard
21. Hazardous waste operations
22. Hazardous work permits
23. Lock Out/Tag-Out
24. Medical monitoring
25. Personal protective equipment (PPE)
26. Radiation protection
27. Silica dust hazard for control of silica dust released during demolition or drilling of concrete or released from work with other materials that contain silica
28. Project Soil Management Plan
29. Project Specific Storm Water Pollution Prevention Plan (SWPPP)
30. Penetration Permits.
31. Thermal stress environments (heat and cold stress)

- C. The Job Hazard analysis and Hazard Abatement Plan must be favorably reviewed by the LBNL Project Manager before work can start on that activity.

- D. Each employee scheduled to work in the activities identified above shall receive safety training in those activities prior to working on them. Workers shall acknowledge being informed of the hazards and protection measures associated with their assigned work activities by signing the JHA. The Subcontractor shall maintain proof of employee training at the work site and make it available to the LBNL Project Manager, upon request. If

LBNL employees are providing direct support for the Subcontractor, they must sign the Subcontractor's overall project JHA.

- E. The favorably reviewed project Hazard Abatement Plan shall be maintained on the work site and shall be made available, upon request, to work site employees and the LBNL Project Manager.
- F. When multiple projects or multiple contractors are performing work within the same building or adjacent areas, and the work performed by one contractor could create hazards for the other contractor, each contractor will be required to participate in the preparation of an overall coordinating JHA. This JHA will identify the controls needed to address these hazards and state how they will be jointly mitigated. Meetings of contractor representatives may be requested by LBNL at the expense of the contractors for additional coordination as deemed necessary by LBNL project management.

1.6 ENGINEERED PROTECTIVE SYSTEMS

- A. Subcontractor shall submit a design and calculations for review to the LBNL Project Manager for any worker, environment, and property protective systems required by regulation or LBNL ES&H requirement to be designed by a registered professional engineer. LBNL's review of such system is solely to verify that the Subcontractor has had the required protective systems prepared and sealed by a registered professional engineer. These systems include but are not limited to shoring, fall protection, false work, and temporary facilities.
- B. LBNL's review of any documents showing the design or construction of protective systems for worker and property protection shall not relieve the Subcontractor of its obligations to comply with applicable laws and standards for the design and construction of such protective work. Subcontractor shall indemnify and hold harmless the University and the Architect/Engineer from any and all claims, liability, costs, actions, and causes of action arising out of or related to the failure of such protective systems. The Subcontractor shall defend LBNL, its officers, employees, and agents and the Architect/Engineer in any litigation or proceeding brought with respect to the failure of such protective systems.
- C. The cost of required engineering services shall be solely borne by the Subcontractor and shall be deemed to have been included in the amount bid for the work as stated in the Subcontract.

1.7 PROCUREMENT OF HAZARDOUS MATERIALS

- A. Subcontractor shall minimize or eliminate the acquisition, use, and release of toxic, radiological impacted and hazardous materials and maximize the acquisition and use of environmentally preferable products. A good resource for identifying environmentally preferable products is the U.S. Environmental Protection Agency website: <http://www.epa.gov/epp/>.
- B. 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, lead or radioactive material.
- C. All materials and applications shall comply with requirements of any and all of the Bay Area Air Quality Management District's regulations, including, but not limited to architectural coatings, general solvent and surface coatings, solvent cleaning operations, adhesive and sealants, visible emissions, and asbestos.
- D. Subcontractor shall keep and maintain proof of compliance with the above-referenced regulations, including any recordkeeping obligations, for a period of two (2) years after completion of the project. Subcontractor shall make such documents or evidence available if so requested by BAAQMD or Lawrence Berkeley National Laboratory.

1.8 SUBCONTRACTOR'S SAFETY SUBMITTALS & SPECIAL WORK PRACTICES

- A. Review by the LBNL Project Manager or his designee of Subcontractor's ES&H submittals required under this Subcontract does not authorize subcontract changes nor relieve the Subcontractor of any ES&H

responsibilities specified in this Subcontract. Project submittals must be submitted to LBNL at least ten (10) working days prior to work commencing for review and approval unless otherwise noted below.

- B. General respiratory protection submittal/work practice requirements for materials, substances, agents, minerals, ingredients, etc., listed in 1.8(C), (D), (E), (G) and (H) and other materials, substances, agents, minerals, ingredients, etc., that have workplace exposure limits associated with them, where respirators are used, include but are not limited to:
1. Medical approval that indicates employee is medically qualified to wear respiratory protection without restrictions.
 2. Written Respiratory Protection Program that contains the elements listed in 29 CFR 1910.134.
 3. Employee respirator training records.
 4. Employee respirator fit test records, as described below and in OSHA's Respiratory Protection Regulation, 1910.134(m)(2), that list the manufacturer, model name or number, size of respirator, and indicates whether the respirator passed/failed, and include the fit factor for quantitative tests.
 5. Describe hazards and controls in JHA for each of the materials/agents listed below.
 6. Respirators shall be elastomeric type vs. filtering facepiece type (e.g., dust mask).
 7. The Subcontractor's health and safety professional shall determine the distance from the hazardous agent generation point source, and demarcate this area as necessary, that requires the use of respiratory protection for either support personnel or other construction trades in adjacent work areas. Factors that the Subcontractor's health and safety professional shall use to make this determination include type of activity, type of occupancy, engineering controls, wind or mechanical ventilation conditions, historical or existing exposure data, area air sampling for the existing tasks/project, and professional judgment.
 8. For all types of respiratory protective devices (e.g., Elastomeric type, disposable dust masks, etc.) used for "voluntary use" purposes, a copy of the company's written respirator program document, evidence of training and medical qualification are required as submittal items.

C. Control of Crystalline Silica Dust

The Subcontractor shall use and provide all engineering controls and respiratory protection at the work site to keep worker exposure to crystalline silica dust within the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) of 0.025 mg/m³. This requirement applies to all tasks that either disturb building materials that contain crystalline silica or when products are used / applied that contain crystalline silica.

Dust control measures require either spraying/misting with water or the use of HEPA filtered local exhaust engineering controls at the dust generating points. Controls also require the use of respirators, disposable coveralls to protect personal or work clothing, industrial grade HEPA vacuums, and HEPA filtered negative air machines.

HEPA vacuums (new or used) used to control silica dust in indoor environments (and outdoor environments where lab employees, guests, passers-by, etc., may be exposed), shall be challenge tested by emery oil aerosol or equivalent and certified as in "passing" condition prior to work commencing. The testing shall be performed by subjecting the negative air machines and HEPA vacuums to a 100% concentration of the challenge aerosol. To achieve this, the equipment must have a tight fitting hose connection on the aerosol generator. The other end of this hose connection is open ended and waved directly in front of the negative air machine filter area, over the entire surface area, including edges where seals are located. The open ended hose is placed directly into the HEPA vacuum hose. Vacuum testing shall include checking around the exhaust vents and the canister/filter housing seals. Vacuums shall not be tested if there is tape or any other type of material used to aid vacuum seals.

The equipment used for testing must be properly calibrated per the manufacturer's recommendations and equipment must be in good working condition with no missing parts. Copies of calibration and testing certifications for each negative air machine/HEPA vacuum shall be provided to LBNL.

Testing shall be completed at the Berkeley Lab outside of buildings in unoccupied areas. Unlike the vacuum testing requirements for asbestos and lead, LBNL Industrial Hygienists (IHs) are not required to be present during the testing and repairs may be made on vacuums used for silica outside of buildings in unoccupied areas as long as the vacuums have not been used for previous asbestos or lead projects. For ongoing projects, HEPA vacuums and other equipment used for indoor silica related work shall be tested every three months, and immediately after changing HEPA filters, and remain onsite during the duration of the project. If

the vacuum or other equipment leaves the LBNL site, it must be retested regardless if the testing was within three months of its last test. HEPA vacuums and other equipment shall not be used for indoor work after changing HEPA filters or bags until they have been tested by a challenge aerosol.

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

1. 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).
2. Work with cementitious materials or other products that may contain silica such as grout, mortar, stucco, gunnite, plaster, sheetrock joint/taping compound, etc.
3. Dry sweeping or sanding of materials that generate dust originating from concrete/cement, rock, or sheetrock joint/taping compound.

Silica related requirements include:

1. Full facepiece negative pressure respirators for indoor work (submit quantitative fit test records).
2. Full facepiece, Powered Air Purifying Respirators (PAPR) for indoor and outdoor tasks that generate a higher risk of silica exposure (i.e., grinding, sanding, jackhammering, chipping, rotohammering or similar high risk tasks) (submit quantitative or qualitative fit test records).
3. Half mask negative pressure respirators for outdoor work (submit qualitative or quantitative fit test records).
4. Documentation of silica awareness training (e.g., copy of training roster).

D. Stainless Steel (Hexavalent Chromium) Welding/Hot Cutting

1. Full facepiece (or approved helmet/hood) Powered Air Purifying Respirator (PAPR) or air-supplying respirator (ASR) for indoor and outdoor work (submit quantitative or qualitative fit test records).
2. Documentation of hexavalent chromium awareness training (e.g., copy of training roster).
3. HEPA filtered local exhaust ventilation directed outside of buildings away from occupants/passers-by.

E. General Welding (including new steel/metal where coatings do not exist)

1. Half mask, negative pressure, air-purifying respirator.
2. HEPA filtered local exhaust ventilation directed outside of buildings away from occupants/passers-by.
3. See lead requirements listed in 1.8(H) for welding where lead coatings have been removed or exist.

F. Confined Space Entry

1. Confined Space Program
2. Atmosphere testing records (ongoing submittals)
3. Entry Permits (on-going submittals)
4. Employee training records

G. Epoxy Coatings or Other Chemical Products

1. MSDSs
2. Ensure JHA addresses required use of mechanical ventilation for indoor work, protective clothing, and hand protection.
3. Full facepiece or half mask negative pressure air purifying respirators for indoor or outdoor work with qualitative fit tests for either type.
4. Chemical splash goggles are required with half mask respirators.

H. Asbestos and Lead

1. Submittal items are covered under Division 02 (LBNL's Lead and Asbestos Specifications).
2. Follow OSHA's Lead in Construction Regulations, LBNL's Lead Specification and this section during any disturbance of construction or building materials (and products) that contain any amount of lead (e.g., cold cutting, drilling, sanding, welding/hot cutting or otherwise disturbing material). Workers performing these types of tasks must wear respiratory protection and perform personal air sampling to determine employee occupational exposures to lead. Exposure assessment reports must be provided to LBNL as a submittal item.

3. Provide workers with asbestos training (e.g., OSHA Class III 16 hour or 4 hour specialized trades training) for incidental disturbance of asbestos containing building materials related to performing trades work (e.g., installing conduit or other items on sheetrock walls) or subcontract this work out to an asbestos abatement subcontractor. Workers performing these types of tasks must wear respiratory protection and perform personal air sampling to determine employee occupational exposures to asbestos. Exposure assessment reports must be provided to LBNL as a submittal item.
- I. Emergency Eyewash
1. Provide a portable eyewash station (non hand held squeeze bottle type) that will provide fifteen (15) minutes of continuous water flow for paints, solvents, adhesives, fine particulate matter, etc., and tasks such as spraying, mixing, etc., that involve risk of the product entering employees' eyes.
- J. Heat Stress (Per CCR Title 8, Section 3395)
1. Provide and maintain continuous natural or artificial shade when outdoor air temperature exceeds 85 degrees F and upon request when below 85 degrees F.
 2. Implement high heat procedures when the outdoor air temperature exceeds 95 degrees F.
 3. Provide Heat Illness and Prevention Procedures upon request or as part of subcontractor's health and safety plan.
 4. Provide effective training per Title 8, Section 3395 to each employee and their supervisors.
- K. Protection of LBNL Workers
1. The Subcontractor shall take steps to prevent exposure to LBNL workers in adjacent work areas including, but not limited to, the use of poly walls, negative pressure enclosures, demarcated work areas, hazard communication, signage, engineering controls, and other administrative controls.
- L. Use of Filtering Facepiece Respirators (i.e., disposable dust masks, N95 respirators)
1. Filtering facepiece respirators shall not be used for materials, substances, agents, minerals, ingredients, etc. that have an established workplace exposure limit.
 2. Employees must be trained on the use of filtering facepiece respirators. Filtering facepiece respirators must be certified by NIOSH.
 3. Employees must be provided a copy of Appendix D to 29 CFR 1910.134, Information for Employees Using Respirators When Not Required Under Standard.
 4. It must be determined that the use of filtering facepiece respirators (disposable dust masks) is acceptable for the intended use.
 5. Subcontractor shall submit filtering facepiece respirator training records for all persons using filtering facepiece respirators for review and acceptance by the LBNL Project Manager.
- M. Subcontractor Personal Air Sampling
1. The Subcontractor is responsible for performing hazard assessments and exposure assessments (personal air sampling) that meets the requirements of DOE's Worker Protection Rule (10 CFR 851) and shall notify their employees of exposure monitoring results per OSHA requirements and 10 CFR 851. LBNL requires written documentation from the Subcontractor that demonstrates the Subcontractor's employees were notified of their results within the time frame specified by OSHA substance specific standards and within fifteen (15) days of receiving the results for all other agents per 10 CFR 851, regardless of whether the results are below exposure limits or action levels.
 2. The Subcontractor shall collect air samples using air sampling pumps that have been properly calibrated before and after collecting each sample. The pumps shall be calibrated using a primary calibration source or a secondary calibration source that has been properly calibrated against a primary source. The Subcontractor must provide LBNL a copy of the air sampling pump calibration data.
 3. Subcontractor shall submit personal air sampling data (ongoing submittal) collected by the Subcontractor and submitted to LBNL within 24 hours of sample collection for all personal air samples collected by the Subcontractor.
 4. Personal air samples shall not be collected on Subcontractor or LBNL employees unless the employees are wearing a properly fit tested respirator for which the employee has also received respirator training, a medical approval to wear the respirator, the employee is clean shaven and the employee's company has submitted a written respirator program that has been reviewed and accepted by the LBNL Industrial Hygiene Group.

N. Use of Radioactive Material or Radiation Producing Devices

1. Subcontractor shall submit for approval to the LBNL's Radiation Protection Group, prior to bringing on LBNL's property, state license, state reciprocity agreement, plans, and procedures for use of radioactive material and/or radiation producing devices.

O. Environmental Protection

1. Prevent releases of construction pollutants to soil, air, water, and sewer and storm drains.
2. Comply with storm drain requirements, air emissions permits and notifications, and site-specific soil management plans.

1.9 WORK SITE SAFETY ORIENTATION

- A. As part of the post award/pre construction process, a meeting will be conducted and attended by the subcontractors' Project Principal, Project Manager, Superintendent, Safety Officer/coordinator, and representatives from tiered sub-contractors, to discuss LBNL Safety Policies, Procedures and Requirements including LBNL's expectations regarding safety and subcontractor safety compliance.

- B. 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 of the Construction Subcontractor Safety Handbook Version 2.0 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.

- C. LBNL provided LOTO Orientation: In addition to the safety orientation listed in paragraph 1.9 B., 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 NFPA 70E.

- D. Each employee shall receive initial Site Specific Safety Orientation prior to performing any work on the project. The Subcontractor shall maintain on the work site a detailed outline of the orientation and a signed and dated roster of all employees who have completed the project Safety Orientation. Subcontractor shall make documentation available to the LBNL Project Manager on request.

E. Existing Site Conditions

Subcontractor employees shall be made aware that they may be impacted by certain existing building components or materials that are known or presumed to contain hazardous materials including, but not limited to, asbestos and lead. Subcontractors shall 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 pause work and notify LBNL immediately. Common building materials that contain asbestos at LBNL include, but are not limited to, floor tile and mastic, sheetrock and taping compound, pipe insulation, fire doors, and transite. Paint surfaces and settled dust commonly contain lead.

- F. The orientation shall, at a minimum, cover the following points:

1. Employee rights and responsibilities.
2. Construction Subcontractor responsibilities.
3. Alcohol and drug abuse policy.
4. Subcontractor's disciplinary procedures.
5. First aid and medical facilities.

6. Site and project specific hazards.
7. Hazard recognition and procedures for reporting or correcting unsafe conditions or practices.
8. Procedures for reporting accidents and incidents.
9. Fire fighting and other emergency procedures to include local warning and evacuation systems.
10. Hazard Communication Program.
11. Access to employee exposure monitoring data and medical records.
12. Protection of the environment, including air, water, and storm drains from construction pollutants.
13. Location of and access to reviewed project IIPP/SSSP, Job Hazard Analysis, and Hazard Abatement Plan.
14. Location and contents of required postings.
15. General Employee Radiation Training and any other required LBNL training.

1.10 SAFETY INSPECTIONS BY SUBCONTRACTOR

- A. The Subcontractor's onsite health and safety representative shall conduct safety inspections of the project operations, materials, and equipment frequently throughout the day to ensure that all safety deficiencies are identified and corrected. Any defective tools, ladders, electrical cords, etc., will be immediately taken out of service, tagged, and promptly removed from the job site.
- B. Inspection findings and corrective actions taken shall be documented, and the record shall be kept on the construction work site and be made available to the LBNL Project Manager upon request.
- C. The Subcontractor's onsite health and safety representative shall cooperate with and comply with all safety directives communicated by LBNL Project Management and LBNL EH&S support staff.

1.11 DAILY PLAN OF THE DAY (POD) SAFETY BRIEFING AND PRE-TASK HAZARD ANALYSIS (PTHA)

- A. A daily Plan of the Day (POD) safety briefing shall be conducted in accordance with the guidelines provided in Appendix B of the Construction Subcontractor Safety Handbook Version 2.0 by the Subcontractor health and safety representative, superintendent, or work crew foreman for all employees on the work site.
- B. The objective of the POD safety briefing is for the Subcontractor to communicate LBNL's expectations regarding safety to their employees. Appendix B of the Construction Subcontractor Safety Handbook Version 2.0 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, names of employees in attendance, and subjects discussed.
- C. 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 safely perform the work.
- D. 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 feet, or work using personnel lifts).

1.12 FIRE PROTECTION AND PREVENTION

- A. The Subcontractor shall develop and maintain an effective fire protection and prevention program at the job site through all phases of the project, including demolition, alteration, repair, and construction work. This program shall be submitted to the LBNL Fire Marshal's Office for review and concurrence prior to commencement of work. Subcontractor shall ensure the accessibility and availability of fire protection and suppression equipment.
- B. Fire apparatus access roads shall be maintained free of all obstructions and in good condition.
- C. Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard. Such areas shall be conspicuously posted with "NO SMOKING OR OPEN FLAME" signs.

- D. Smoking is not permitted in any LBNL building, or in areas near dry grass or vegetation. Smoking is permitted only in designated areas outside LBNL buildings.
- E. Smoking is prohibited in buildings under construction once installation of doors or windows has begun.
- F. Burning of debris on University property is not permitted.

1.13 FLAGGERS

- A. Subcontractor shall furnish an adequate number of flaggers for all work that may affect the safety of pedestrians or the use of University roads.
 - 1. Flaggers shall be posted at the entrance and exit of access roads used for hauling material and at all other areas where normal traffic is subject to disruption.
 - 2. Flaggers shall be equipped and instructed at Subcontractor's expense in accordance with current "Instructions to Flaggers" of the Department of Transportation, State of California.

1.14 CONSTRUCTION CRANES

- A. Cranes used by Subcontractor shall be State of California certified. A valid copy of such certificate shall be available at each crane or derrick and shall indicate: 1) all required tests and/or examinations have been performed, 2) any defects found by such examination and tests have been corrected, and 3) that the equipment is in safe operating condition at the time of examination.
- B. Cranes assembled/disassembled on site at LBNL shall be done so under the direction of a competent rigger identified as the assembly/disassembly supervisor. An assembly/disassembly procedure written for the specific crane (written by the manufacturer, or the crane subcontractor) shall be submitted to the University.
- C. Crane operators shall be qualified in the safe operation of cranes or hoisting apparatus. Subcontractor shall submit documentation to the University verifying qualifications of the operators.
- D. Crane signal personnel shall be qualified through training. Subcontractors shall submit to the University evidence of successful completion issued by the CURRENT employer's qualified evaluator, or a third party (not a former employer) qualified evaluator.
- E. Riggers shall meet competent person requirements for rigging. Subcontractors shall submit documentation to the University verifying competency.
- F. Additional submittal and crane safety requirements are found in PUB-3000 Chapter 10, Construction Safety, Appendix A.1 Construction Cranes.

1.15 STORM WATER POLLUTION PREVENTION

- A. For ALL projects where construction activities, such as clearing, grading, demolition, and excavation result in 1 or more acres of soil disturbance, or are part of a common plan of development that exceeds these same thresholds, a project-specific Storm Water Pollution Prevention Plan (SWPPP) is needed. Specific details for development and implementation of a project-specific SWPPP are listed in Section 015723. For projects that disturb between 1 and 5 acres and would qualify for an EPA Small Construction Erosivity Waiver (typically completed during the summer months), contact EH&S Environmental Services Group (ESG) storm water subject matter expert for implementation requirements.
- B. For all projects, the following requirements apply. The Subcontractor shall implement the following Best Management Practices (BMP) and requirements to protect the storm drain system during all construction, demolition or maintenance activities (referred to as construction activities below):
 - 1. Soils erosion and sediment control:
 - a. The Subcontractor will try to preserve existing vegetation to the largest extent possible.

- b. The Subcontractor will schedule construction activities to minimize the exposure of disturbed soil to wind, rain, and storm water run-on and run-off; and minimize soil disturbing activities.
 - c. The Subcontractor will apply hydroseeding to protect disturbed soil areas from soil erosion. The hydroseeding materials will be applied after final grading operations. As an alternative to hydroseeding, the subcontractor can apply compost blankets to protect disturbed soil areas from soil erosion.
 - d. (The following procedure will apply to all Subcontractors for all LBNL projects unless LBNL provides specific direction to the Subcontractor that alternate materials may be used). The Subcontractor will place erosion control matting (ECM) in accordance with the Construction Documents. The materials used to make the ECMs should be completely bio-degradable; ECMs shall not include any synthetic component so as to avoid any potential adverse impact on the federally and state-designated "threatened" Alameda whipsnake. At a minimum (e.g., absent any further recommendations from LBNL particular to that site), the erosion control matting should be installed on all new cut and fill areas with slopes of 2 to 1 or greater.
 - e. (The following procedure will apply to all Subcontractors for all LBNL projects unless LBNL provides specific direction to the Subcontractor that alternate materials may be used). Implement sediment controls when soil areas will be disturbed during the subcontract work. At a minimum (e.g., absent any further recommendations from LBNL particular to that site), the perimeter of the disturbed area must have sediment controls installed, such as gravel bag berms or fiber rolls. Fiber rolls or straw wattles consist of straw fibers that are rolled or bound into a tight tubular roll and wrapped in burlap or other natural material (synthetically-wrapped or plastic wrapped fiber rolls shall never be used anywhere on site to avoid risk of harm to the Alameda whipsnake. Erosion Control Mats containing synthetic material are prohibited for the same reason).
 - f. The Subcontractor will sweep the streets throughout the project site where noticeable tracking of materials occurs onto paved roads. Street sweeping will be performed, if needed, daily from the beginning of construction activities until completion of the project.
 - g. Effectively manage vehicular and equipment site ingress and egress to avoid tracking mud onto paved grounds.
2. Identify all storm drain inlets surrounding and downstream from the Subcontract work that may be affected by this work. Upon identification of the drain inlets, install protective catch basin inserts or other equivalent filter structure. During critical construction operations where potential exists of non-storm water entering the storm drain inlet, the inlet should be sealed off with urethane sheets or plastic covers. Once the critical construction is completed the drain inlets should be opened up again.
 3. The Subcontractor will implement wind erosion BMPs to alleviate nuisance dust. The Subcontractor will utilize a water truck to mist moderate quantities of water on exposed soil during demolition of buildings, trenching, grading, and other soil disturbing activities in accordance with the specifications. Drain inlets should be appropriately protected to alleviate any non-storm water (e.g., dust control water), sediment or construction debris from entering the storm water drain inlets.
 4. Non-Storm Water Control:
 - a. The Subcontractor will implement water conservation practices when water is used on the project site. The Subcontractor will ensure any leakage will be repaired promptly and that all water equipment will be kept in good working condition. The disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system is prohibited.
 - b. During paving and grinding operations the Subcontractor will cover drainage inlets to protect storm drainage facilities. Residue from sawcutting operations will be vacuumed up and disposed appropriately.
 - c. The Subcontractor will report any instances of illegal discharges or illicit connections immediately (see part 1.17 below).
 - d. Vehicles and equipment cleaning will be performed prior to removing vehicle and equipment from the site. Vehicle and equipment cleaning pertains only to dry cleaning methods such as with rags, brooms, etc. Any equipment cleaned with steam or water must be transported off site to an appropriate location to use this method.
 - e. Vehicle and equipment maintenance will be performed within the designated area. Spill prevention measures will be put in place to prevent the discharge of vehicle and equipment fluids.
 - f. During concrete operations, Portland Cement Concrete (PCC) and curing chemicals should be placed where they are removed from exposure from rainfall, runoff from other areas, or where runoff from PCC will leave the site. The water from concrete finishing operations should be collected and disposed of appropriately. Protect all drain inlets during those concrete curing and finishing operations. The Subcontractor will assure that the concrete washout will be completed offsite.

5. Waste Management and Materials Pollution Control:
 - a. All Subcontractors involved with delivery and storage of construction materials will be educated on the proper material handling practices.
 - b. The Subcontractor will prevent misuse and overuse of materials. Proper amounts of materials will be prepared for each work shift to avoid generating excess. MSDSs, material inventory and emergency contacts will be maintained with the foreman or superintendent. Spill kits will be kept onsite for immediate use.
 - c. Properly store and contain soil stockpiles and other materials to prevent them from entering storm catch basins. The proper storage of stockpiles would consist of a weighted-down temporary tarp covering materials and a linear barrier (staked straw wattles in soils or gravel bag berms on asphalt) surrounding the stockpile. This controls both storm water runoff and runoff. All other loose construction materials (e.g., bags of cement, open plastic containers) should be placed on pallets and covered with a tarp.
 - d. The Subcontractor will ensure that materials are sealed and secured on level ground to prevent the possibility of a spill. Spill kits will be available onsite for control in the event of a spill, in addition all construction personnel should be trained on what a significant spill is for each material that is used, and what are the dangers and appropriate response for major and minor spills. All chemicals will be stored in watertight containers with appropriate secondary containment to prevent any spillage or leakage; or will be stored in a completely enclosed storage shed.
 - e. Solid waste will primarily consist of demolished non-hazardous solid waste, recyclable material and general litter. Solid waste will be loaded directly into truck bins for offsite disposal. All waste disposal containers will be covered (with ultraviolet resistant plastics, if plastics were deemed necessary) at the end of every business day and during rain events. Discharges from the waste disposal containers to the storm water drainage system need to be prevented.
 - f. The Subcontractor will maintain portable toilets for onsite use during the project. The portable toilets will be located within the construction yard. The toilets will be located on level ground, away from the concentrated flow of traffic, and a minimum of 45 feet away from drainage facilities and watercourses. Weekly maintenance will be provided by a licensed sanitary/sewer waste hauler and waste will be disposed offsite.
 - g. 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.
6. 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 during construction.
7. Weekly, inspect and maintain BMP measures; in addition inspect BMPs daily during and after each rain event.

Recommendations in the California Storm Water Best Management Practices Handbooks and portal, published by the California Storm Water Quality Association (CASQA), can be used as further guidance to protect LBNL's storm water drainage system.

1.16 ACCIDENTS

- A. The Subcontractor's representative shall immediately notify the LBNL Project Manager and LBNL Safety Engineer of any accidents, injuries, or occupational illnesses that occur on the project, regardless of the employer of the involved personnel or the owner of the involved materials or equipment. For OSHA recordable injuries, the Subcontractor shall also furnish a copy of the OSHA Form 301 (or equivalent) to the LBNL Project Manager within five (5) days of the injury.
 1. In the event a job site accident occurs, the Subcontractor shall immediately implement controls and restrictions on the accident site to ensure the site remains undisturbed until released in writing by the University to resume work.
 2. The Subcontractor shall provide accident investigation follow-up and shall support LBNL's accident investigation and reporting protocol required by PUB-3000, Chapter 5, Part 5.1, Incident Reviewing and Reporting.

1.17 SPILLS

- A. The Subcontractor shall promptly report to the LBNL Project Manager any spill, deposit, leak, drainage, debris, residue, spoil, residual, and/or by-product, whether its presence at the jobsite is occasioned by accident, inadvertence, intent, discarding, or abandonment by the Subcontractor or its lower tier subcontractors. This reporting requirement applies to petroleum products, oil, lubricants, chemical substances (including elemental mercury), radioactive material, waste materials, and waste substances which are in such quantities as to constitute a hazardous substance or hazardous waste under Title 22 of the California Code of Regulations. In addition to the aforementioned hazardous materials reporting, domestic waters at LBNL contain chloramines, which make domestic water discharges into a storm drain inlet reportable to regulatory agencies. Reporting for domestic water discharges shall be made to the LBNL Project Manager or LBNL Construction Manager. If they are not available, call the LBNL emergency number (7911) from a LBNL phone or 911 from a cell phone.
- B. All such occurrences of any quantity involving elemental mercury, paints, solvents, thinners, degreasers, PCBs, halogenated hydrocarbons, volatile organic compounds, radioactive material, and/or asbestos shall be deemed a reportable event. These identification and reporting requirements shall be the responsibility of the Subcontractor for both its own work forces as well as for any lower tier subcontractor, materialman, or supplier performing work on site for the Subcontractor. Reporting shall be made to the LBNL Project Manager or LBNL Construction Manager. If they are not available, call the LBNL emergency number (7911) from a LBNL phone or 911 from a cell phone.
- C. In no event, shall any spill(s) identified as a hazardous substance or hazardous waste be removed from the University without prior direction by the LBNL Project Manager, and the LBNL EH&S Division representative. All removal, cleanup, and associated costs which result from Subcontractor or lower tier subcontractor, material man, or supplier presence at the jobsite, shall be at the Subcontractor's sole expense. Removal, cleanup, and associated remedial measures shall be effected at the exclusive option of the University by either University personnel or the Subcontractor under the supervision of an authorized University representative.

1.18 RADIATION SAFETY TRAINING AND DOSIMETRY

- A. All Subcontractor personnel, including lower tier subcontractor personnel, required to work in area(s) identified and controlled for radiological hazards, must attend a radiation safety training session approved by the LBNL Radiation Protection Group or as agreed by contract. Work activities in areas controlled for radiological hazards will be managed according to LBNL's Radiation Protection Program, as implemented via Radiological Work Authorization (RWA) and/or Radiological Work Permit (RWP). These implementing documents will specify radiation safety controls, dosimeter requirements, and the level of required training based on scope of work and likely radiological hazards. Level and duration of controls, dosimeter, and training will be based on LBNL's Radiation Protection Program, as prescribed by relevant regulation, and the degree of potential hazard. Typical duration of the General Employee Radiological Training (GERT) is approximately one (1) hour. Radiation Worker One and Two is approximately 8 -12 hours respectively. Subcontractor may be required to secure their own Radiation Worker training from a non-LBNL source,

1.19 SPECIAL PERMITS

- A. Subcontractor must submit permit requests to LBNL at least ten (10) working days prior to work commencing to allow time for review and issuance of permit unless otherwise noted below. Radiological Work Permits and Radiological Work Authorization require a minimum of 30 working days prior to commencing radiological aspect of the scope of work. No work that requires a permit may begin until the permit is approved by the LBNL Project Manager and posted at the job site.
- B. Permit to Penetrate Ground or Existing Surfaces of LBNL Property
 1. Prior to any penetration of any existing surface of LBNL property, the Subcontractor shall obtain from the LBNL Project Manager a Permit to Penetrate or Excavate Existing Surface of LBNL Property and shall adhere to the conditions of the permit during such work. The Permit and all conditions in it shall be considered part of these specifications and shall be included in the Subcontractor's bid amount.
 2. In areas where a Permit to Penetrate or Excavate Existing Surfaces of LBNL Property is not required, Subcontractor shall verify by safe means, prior to drilling, that no utilities or services are enclosed within the area to be drilled.

3. The permit is required for all concrete surface (walls, floors, ground including asphalt paving, etc.) penetration work regardless of depth. For other types of penetrations, this permit is required if the penetration depth is greater than 1-5/8 inches. A Penetration Permit will not be issued if the area cannot be scanned or reliable data on utilities location cannot be obtained.
4. The permit is valid for 30 calendar days from the time of issuance. One thirty day extension may be requested.
5. Exceptions:
 - a. Staking in soil using wood stakes no deeper than 6 inches is permitted without a Penetration Permit.
 - b. No Penetration Permit is required for gypsum board (sheetrock) wall penetrations provided that the area has been swept for active and passive electrical current by LBNL Utility Coordinator or his designee, both sides of the wall have been visually inspected for evidence of repairs, and the wall cavity has been visually inspected for hidden objects. The wall cavity shall be inspected by cutting a square opening (not more than 12" square and not more than 3/4" deep) and visually inspected for any hidden objects within the surface penetration area. Multiple openings can be made for complete inspection of the wall cavity if needed.
 - c. No Penetration Permit is required for cutting asphalt berms provided the cut is less than 1 5/8" into the underlying asphalt pavement.

C. Fire Safety Hot Work Permit

1. All operations with open flames or that cause sparks or are near gas lines or near combustible storage containers require a daily Fire Safety Hot Work Permit issued by LBNL. Subcontractor shall not commence such work until the permit is issued. Activities requiring a Fire Safety Hot Work Permit are described in NFPA 51B and include, but are not limited to, electric arc and gas welding and flame cutting, other open flame operations, tar kettles, powder activated tools, and excavations. The daily permit may be obtained from the LBNL Fire Marshal's Office, telephone (510) 486-5479.
2. Fire watch personnel shall be provided by the Subcontractor in sufficient number to continuously monitor all locations where work requiring a Fire Safety Hot Work Permit is being conducted. The fire watch personnel shall remain on the job at least thirty (30) minutes after such operations are completed.
3. Noncombustible shields or covers shall be provided by the Subcontractor on tables, floors, walls, around the work station, and over equipment to protect building structures, equipment, and personnel from sparks and fragments of hot metal. Subcontractor shall also take these precautions to protect against sparks and hot metallic oxides generated by grinding, drilling, or sawing operations.

D. Permit to Conduct Electrical Work and Perform Lock Out/Tag Out

1. Work practices, equipment, and PPE must be compliant with, and maintained in accordance with, PUB-3000 (with specific attention to Chapters 8, 10, and 18); 29 CFR 1910, Subpart S; and NFPA 70E, Standard for Electrical Safety in the Workplace. Work will only be permitted to be performed on or near exposed energized electrical circuits or components when it can be demonstrated that de-energizing introduces additional or increased hazards, or is infeasible due to equipment design or operational limitations. When this is the case, an Energized Electrical Work Permit (EEWP) will be issued. In all other cases, the work will be done under LOTO with an approved LOTO permit. NOTE: The definition of "working near" potentially energized parts, is any activity conducted within the Limited Approach Boundary".
2. Electrical workers shall be qualified to perform electrical tasks in accordance with OSHA 29 CFR 1910 and 1926, and NFPA 70E requirements. If the work involves potential exposure to more than 250 volts, then support from a second QUALIFIED WORKER is required (see PUB-3000, Chapter 8, for exemptions to the two-person rule). The second qualified worker must be able to de-energize the equipment, know the location of the nearest telephone and how to alert emergency personnel, be able to free an injured worker from the hazard, be trained in first aid and CPR, and remain in constant visual and audible contact with the workers performing the work.
3. Subcontractor employees must be trained to identify and understand the relationship between electrical hazards and possible injury. Training must be appropriate to the technical requirements of the work assignment as well as all applicable safety-related work practices.
4. Each electrician must be a licensed journeyman in the state of California, and must be prepared to display their journeyman card if asked. Electrical apprentices may work at LBNL, but they must be registered with the State of California apprenticeship program, and under the direct supervision of a journeyman at all times. Only one apprentice per journeyman is permitted.
5. Every subcontractor performing electrical work at LBNL must submit a written electrical safety program to his or her point-of-contact. The subcontractor's point-of-contact will forward the subcontractor's

program to the appropriate reviewer for approval. Please allow two weeks for approval. Permits for work within the Limited Approach Boundary, Restricted Approach Boundary, or Arc Flash Protection Boundary (including LOTO testing/verification) WILL NOT BE ISSUED until the subcontractor employer has an approved electrical safety program. For an example of the elements of an electrical safety program, see Annex E of NFPA 70E.

6. No subcontractor employee shall apply a lock or tag to any circuit or equipment, test/troubleshoot, or 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 LOTO permit or an EEWP as necessary.
7. Energized Electrical Work Permits: **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.
 - a. Signing the Energized Electrical Work Permit by any subcontractor employee constitutes acceptance of the permit conditions as supplementary to your company's electrical safety plan.
 - b. An EEWP can be obtained online, at <http://electricalsafety.lbl.gov>. Do not open covers on energized equipment without first obtaining an EEWP.
 - c. LOTO verification testing is treated as energized work, but is covered by the LOTO permit. An EEWP is not required for this task alone.
 - d. Once the EEWP has been approved, it will be printed out by the subcontractor's point-of-contact. The point-of-contact will conduct a briefing with all of the workers, explaining to them the scope of the EEWP and their respective roles and responsibilities.
 - e. Comply with all terms, the scope, and conditions stated on the permit.
 - f. 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.
 - g. The permit may not be used beyond the expiration date. All work under the permit must be completed by the expiration date. If an extension is required, contact LBNL Electrical Safety.
 - h. The permit is to remain on the jobsite and be produced at anyone's request.
 - i. When the work has been completed, give the permit to the POC for transmittal to the LBNL Electrical Safety Engineer.

E. Radiological Work Permits (RWP) and Radiological Work Authorizations (RWA)

1. A Radiological Work Permit specifies the radiological controls that contribute to a safe workplace and maintain radiation exposures as low as reasonably achievable (ALARA). It informs workers of the procedures required to control radiological hazards for their work and documents their agreement to meet those requirements. The RWP process incorporates integrated safety management (ISM) concepts with respect to radiation hazards.
2. Radiological Work Authorization and RWA lower tier documents; Low Activity Source (LAS) Authorizations and Low Dose Machine (LDM) Authorizations. The RWA, LAS and LDM processes incorporate integrated safety management (ISM) concepts at LBNL with respect to radiation hazards arising from the use of unsealed and sealed sources of radioactive materials as well as radiation producing machines, intentional emitters, or otherwise.

F. LOTO Permits for Non-Electrical Hazardous Energy Sources

1. A Lockout/Tagout permit is required before shutting off and working on or near any non-electrical energy source, such as rotational, mechanical, pressure, thermal, etc. See Section 1.19 (D)(7).

G. Confined Space Entry Permit:

1. Confined spaces are work locations that meet regulatory definitions and require rigorous hazard analysis and work authorization. A confined space is a space that:
 - a. is large enough and so configured that an employee can bodily enter and perform assigned work;
 - b. has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
 - c. is not designed for continuous employee occupancy.
2. Prior to any subcontractor entering a Permit-required Confined Space (PRCS), the subcontractor's PRCS Program must be reviewed by LBNL's Confined Space Program Manager and approved by the

- LBNL Construction Safety Manager and LBNL subcontractor management (CM/PM). Confined space entry by a subcontractor either under Reclassification, Alternate Entry Procedure, or as a permit entry is conducted under the documentation that is part of the subcontractor's approved PRCS program.
3. Entry into a PRCS by a subcontractor (including entries after Reclassification or Alternate Entry Procedures) is allowed only through compliance with a PRCS program meeting the requirements of Cal/OSHA 5157. The subcontractor's PRCS program must be approved by the Confined Space Program Manager before an entry into a confined space is authorized.
 4. Prior to any permit entry into a PRCS (i.e., the space cannot be Reclassified or entered under Alternate Entry Procedure) by a subcontractor, an LBNL Construction Safety Entry Supervisor must review and approve the entry documentation prepared by the subcontractor (i.e., entry permit, plans to isolate the space, purging procedures, monitoring equipment, equipment calibration records, communications methods, training records, coordination procedures, and authorizations) and concur on their adequacy.
 5. For all permit entries into a PRCS, the subcontractor shall provide for emergency rescue capabilities and personnel. Alameda County Fire shall not be relied upon to provide rescue and emergency services.
 6. LBNL will provide the subcontractor with all information contained in the LBNL Confined Space Inventory about the PRCS in or near the area where the subcontractor will be working, including the hazards identified and LBNL's experience with the space(s) that makes them PRCS, and precautions or procedures that LBNL has implemented for the protection of employees in or near the PRCS.
 7. If there are multiple subcontractors who will simultaneously enter the PRCS, or if subcontractor and LBNL personnel will be working in or near the PRCS, a meeting will be convened to discuss the work that will be performed in and around the PRCS. Entry operations will be coordinated such that employees of one subcontractor do not endanger LBNL employees or the employees of any other subcontractor. No subcontractor shall enter a PRCS under any Reclassification, Alternate Entry Procedure, or permit until coordination procedures and authorizations have been agreed upon. The coordination procedures and authorizations must be documented in a written step-by-step timeline of activities.
 8. The subcontractor will be debriefed at the conclusion of the PRCS entry operations regarding the permit space program followed, and regarding any hazards confronted or created in permit spaces during entry operations. The results of the debriefing will be documented on the Permit-required Confined Space Entry Debrief. A separate debrief must be completed for each subcontractor entering the PRCS.

1.20 AIR EMISSIONS PERMITS AND NOTIFICATIONS

- A. For all projects that involve demolition of a structure, the Subcontractor shall complete the BAAQMD asbestos demolition forms and notify BAAQMD at least ten (10) working days in advance of the activity, regardless of the presence of asbestos. The Subcontractor must provide LBNL a copy of the BAAQMD Notification.
- B. For all projects that involve removal of regulated asbestos containing materials above threshold quantities (see BAAQMD Regulation 11-2, available at www.baaqmd.gov), the Subcontractor shall complete the required asbestos removal forms and notify the BAAQMD at least ten (10) working days in advance of the activity. The Subcontractor shall provide LBNL a copy of the removal forms.
- C. For operations required to obtain an Authority to Construct or Permit to Operate from the BAAQMD, the Subcontractor shall provide in advance to the LBNL Project Manager the information needed for the application. BAAQMD may take more than forty (40) working days to process the application and issue the Authority to Construct or Permit to Operate; the Subcontractor shall include this time in his Schedule of Operations; no extra cost will be granted by LBNL under this Subcontract for this wait period.

1.21 AUDIT OF SUBCONTRACTOR WORK SITES

- A. The LBNL Project Team shall monitor the Subcontractor's project for safety compliance. If a HIGH safety non-compliance is identified a verbal STOP WORK ORDER shall be given to the Subcontractor, and the Subcontractor shall immediately cease applicable operations. A Safety Deficiency Notice shall then be issued by LBNL project management to the Subcontractor detailing the findings.
 1. Upon receipt of a written Safety Deficiency Notice from the University (refer to Paragraph 1.23), the Subcontractor shall take appropriate action to correct the deficiency and discontinue the hazardous activity until the hazard is abated. Failure to correct or eliminate violation(s) within the period specified

may result in LBNL stopping all or any part of the work. See Environment, Safety, and Health Clause in the General Provisions.

2. The Subcontractor shall submit to the LBNL Project Manager a written response to the Safety Deficiency Notice describing what corrective action it has taken, the date such corrective action was completed, and actions that it shall take to prevent future recurrence of the same incident.

1.22 SITE SPECIFIC SOIL MANAGEMENT PLAN

- A. Subcontractor shall comply with the project-specific Soil Management Plan. The plan shall provide the procedures for onsite soils management and soil disposal requirements consistent with Pub 3000 Section 11.3.7. Other information provided in the plan shall include the location and extent of the area anticipated to be disturbed; any known or suspected contamination; soil analytical testing requirements, protocols and documentation required for handling, transporting, and disposing of excavated soil; conditions requiring stopping work and notification; roles and responsibilities; and safety issues and mitigations including any required monitoring. At a minimum, unless the soil is clean and can be reused on site, all excavated soil shall be disposed of at a California permitted solid waste facility.

1.23 HAZARDOUS WASTE

- A. The Subcontractor shall be responsible for determining if waste generated by the project is hazardous waste. All known hazardous waste will be properly labeled and managed in compliance with applicable waste regulations and LBNL policy. All hazardous waste generated by the Subcontractor will be properly stored within accumulation areas arranged by the project manager. The Subcontractor is responsible for proper waste characterization, packaging and movement of the waste into the properly designated accumulation areas. The project manager will be responsible for contacting LBNL waste management staff who will arrange for proper disposal of all generated hazardous waste. The EH&S Waste Management Group will have the lead responsibility for oversight of waste shipments, integration of subcontractor support for final waste packaging and transportation, and interfacing with the disposal facility.
- B. The Subcontractor shall store containerized wastes near the work area. The subcontractor shall take containers from the generation point directly to the designated accumulation area arranged by the project manager. The Subcontractor shall take special care in the movement of the waste to the designated accumulation area. The designated accumulation areas shall be selected to be the shortest possible distance from the actual generating location.

