



CONSTRUCTION SAFETY REQUIREMENTS MANUAL

Part One: Introduction

Part Two: S&H Program Management

Part Three: S&H Functional Area Requirements

**Appendix: S&H-Related Data Requirements (S&H Forms, Plans,
Permits and other Data Requirements)**

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SLAC Construction Safety Requirements Manual

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**APPENDIX: SAFETY & HEALTH DATA REQUIREMENTS
(S&H Forms, Plans, Permits and other Data Requirements)**

PART I: INTRODUCTION

1 INTRODUCTION

The Construction Safety Requirements Manual (hereafter referred to as “this Manual”) has been developed to define the minimum safety and health requirements for Prime Subcontractors and their sub-tier subcontractors performing construction activities at the SLAC National Accelerator Laboratory (SLAC).

1.1 Background

It is SLAC policy that all subcontractors shall provide a safe and healthful workplace for their personnel as well as SLAC and other affected personnel. The purpose of this document is to assist subcontractors in understanding and implementing the applicable regulatory requirements and SLAC-specific safety requirements. The requirements found in this document will assist subcontractors in complying with 10 CFR 851 and meeting the requirements of SLAC’s Worker Safety and Health Program (WSHP). **Notwithstanding the foregoing and notwithstanding any oversight or direction SLAC may provide, subcontractors, their sub-tier subcontractors, and their agents remain responsible for safely accomplishing the statement of work, and for complying with all applicable laws and regulations.**

SLAC’s goal is **ZERO INCIDENTS**. The Prime Subcontractor and each sub-tier subcontractor’s line management are expected to promote and model this concept and develop, implement, and enforce a safety and health program that will result in a safe work environment. Safety is not to be compromised for production and shall be considered an integral part of the work planning process.

1.2 Scope

The requirements of this Manual apply to all Prime Subcontractors and sub-tier sub-contractors (collectively referred to as “subcontractor” throughout this document) performing construction activities on the SLAC Site. Specific responsibilities of Prime Subcontractors are delineated as such. As stated in Division 01, this Manual is hereby incorporated by reference into the First-Tier Subcontract, having an order of precedence equal to that of Division 01. Prime Subcontractors are obligated to flow down the requirements to their sub-tier subcontractors.

This Manual contains excerpts from, and references to, numerous regulations, codes, and standards which are not presented in their entirety. Similarly, not all Safety and Health (S&H) subject matter is covered in this Manual. Each subcontractor is responsible for ensuring compliance with all applicable requirements that govern their work at SLAC including any consensus standards incorporated therein by reference. If the manual does not contain information relative to a particular safety and health topic, the subcontractor shall ensure that the governing regulatory provisions or national consensus standards, as applicable, are implemented. If there is a conflict between requirements, the subcontractor is to apply the most stringent. The SLAC Field Construction Manager (FCM) and Field Safety Representative are available to assist the subcontractor with this determination, and as circumstances warrant, shall seek SLAC Legal concurrence on regulatory interpretations. Subcontractors are always encouraged to apply best management practices in all of their endeavors.

1.3 Layout of this Manual

The manual begins with an introduction and then presents requirements, policies, and procedures for managing safety on SLAC construction projects. In some cases, the same topic is listed in Section 3 and Section 4. Section 3 contains policies while Section 4 contains specific procedures to implement the policy. Program management requirements such as regulatory compliance, subcontractor screening and qualification, work planning and control, site specific safety plans, documentation of training, safe work permits, job safety analyses, stop work authority, inspections, disciplinary action, incident response and investigation, and occupational medicine are discussed in detail.

The manual then discusses many specific S&H functional areas such as control of hazardous energy, electrical safety, excavation, fall protection, fire safety, and hoisting. For each functional area, the section identifies who the requirements apply to, the broad regulatory drivers, and the subcontractor's responsibilities. Each of these sections also identifies requirements that are specific to SLAC and issues of special emphasis at SLAC. Often the issues of special emphasis necessitate additional risk control mechanisms (e.g., safety plans that shall be submitted for review and approval or permits that shall be obtained prior to performing work).

Lastly, the Appendix contains a list of construction-related data requirements and links to associated SLAC documents and forms.

Note! It is the responsibility of the subcontractor to know, understand and plan for the work at SLAC National Accelerator Laboratory.

1.4 Definitions

Code of Safe Practices: Instructions to each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to their work environment to control or eliminate any hazards or other exposure to illness or injury. Required for construction work by Title 8 California Code of Regulations (CCR) 1509(b) and incorporated by reference in SLAC ES&H Manual Chapter 42.

Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to

employees. The competent person has authorization to take prompt corrective measures to eliminate them.

Construction work: The combination of erection, installation, assembly, demolition, or fabrication activities involved to create a new facility or to alter, add to, rehabilitate, dismantle, or remove an existing facility. It also includes the alteration and repair (including dredging, excavating, and painting) of buildings, structures, or other real property, as well as any construction, demolition, and excavation activities conducted as part of environmental restoration or remediation efforts.

Data Requirements, Safety & Health (S&H): A list of contractually required safety and health submittals such as plans, permits, reports, training records, and certifications.

Definable Work Activity: A construction phase or major task which is separate and distinct from other activities and has separate control requirements. A definable work activity may be identified by different trades or disciplines, or it may be work by the same trade in a different environment.

Injury and illness prevention plan (IIPP): A written plan that describes various aspects of a company's safety management program. Required elements are described in 8 CCR 3203. (SLAC requires the submittal of a comprehensive safety manual that incorporates these elements, as well as specific safety policies and procedures relevant to the type of work the subcontractor performs or manages. See *written safety manual*.)

Qualified Person: A person who possesses the practical skills necessary to perform an activity in a safe and environmentally responsible manner. A qualified person is fully trained, certified, and licensed, as required.

Qualified Person, Electrical (also qualified electrical worker): A person who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify and avoid the hazards involved.

Site-Specific Safety Plan (SSSP): A written plan specific to a project addressing known and anticipated hazards for the work. Required elements of an SSSP are identified in the document based on the activities to be performed. Elements include responsible personnel contact information, safety permits, safety plans, JSAs, hazardous materials list, worker certifications and training records. The SSSP is added to and updated, as needed, throughout the life of a project.

Stop work: A definitive statement made openly that an imminent danger is present and all related activities must stop immediately or that an assigned task poses risk of death or serious injury and will not be performed until appropriate protective measures are established. A stop work situation can be a brief pause to resolve an issue or a lengthier pause including reviewing and editing the JSA, communicating the new controls, training to the new controls, etc.

Subcontractor: Individual or firm that provides skilled or unskilled labor, repair and maintenance services, technical support, or job shop personnel to perform work at SLAC.

Subcontractor, construction: An individual or firm hired by SLAC to execute a construction project.

Subcontractor, Prime: A subcontractor directly contracted to SLAC; also known as a “first-tier subcontractor”. The prime may have sub-tier Subcontractors; may be a general subcontractor or specialty subcontractor.

Subcontractor, sub-tier: A subcontractor hired and under contract to the Prime Subcontractor or another sub-tier subcontractor.

Work Planning and Control (WPC): A standardized process, at SLAC, used to understand the scope of work, identify qualified workers, evaluate & control hazards, communicate hazards & controls to workers, authorize, coordinate & release work, and perform it within established controls.

Written Safety Manual: A Prime Subcontractor’s comprehensive written document that includes a section, in either the body or the code of safe practices, for each area of its proposed work. The written safety manual must include the required elements of a California Injury and Illness prevention plan (IIPP) (8 CCR 3203). For construction work the manual must include a *Code of Safe Practices* (8 CCR 1509[b]) and, for work outdoors or in a warm interior environment, a Heat Illness Prevention Program (8 CCR 3395). A Prime Subcontractor that will supervise the work of one or more sub-tier subcontractors must have safety/health manual elements for each phase of its work *and* the work of its sub-tier subcontractors.

1.5 Roles and Responsibilities

Field Construction Manager (FCM): SLAC staff responsible for communicating requirements to construction subcontractors, ensuring the Work Planning and Control (WPC) process is properly implemented, assisting subcontractors in obtaining necessary SLAC permits and developing acceptable safety plans, verifying documentation and training, and providing oversight and feedback.

Field Safety Representative (FSR): SLAC staff responsible for assisting the FCM with safety oversight and support. Reviews and approves Site Specific Safety Plans (SSSPs), Job Safety Analyses (JSAs), safety plans, and related records. Performs frequent inspections of the jobsite and works with FCM and subcontractor to correct identified hazards. Advises FCM and subcontractor on ES&H requirements.

Project Manager (PM): SLAC’s management representative with overall responsibility for a project.

Proposer: The individual or company that responds to the SLAC request for proposal. When the subcontract is awarded the proposer becomes a SLAC *Prime Subcontractor*.

Procurement Specialist: Legal representative for SLAC on subcontracts and other business matters; the SLAC Purchasing / Supply Chain Management Department representative for business matters.

Safety Representative: A qualified professional assigned by the subcontractor to assist the on-site superintendent/foreman in managing and implementing safety and environmental compliance for a project.

Superintendent/foreman: The qualified individual who is the subcontractor's on-site manager of day-to-day activities on a construction project. This person has the overall responsibility for work planning and control.

PART II: SAFETY & HEALTH PROGRAM MANAGEMENT

2 SAFETY & HEALTH PROGRAM REQUIREMENTS

2.1 Purpose

This section describes regulatory and SLAC-specific requirements for safety program management. The aim of the safety program, in accordance with SLAC and Department of Energy (DOE) requirements, shall be to provide a safe and healthful workplace.

2.2 External Requirements

Title 10 of the Code of Federal Regulations, Part 851 (10 CFR 851), Worker Safety and Health Program, requires that all tiers of subcontractors supporting the Department of Energy (DOE) mission to be in compliance with this Rule. Subcontractors are responsible for reviewing the requirements of this regulation and determining the applicability to their work and to the subcontracted services they provide to SLAC.

SLAC has developed a Worker Safety and Health Program (WSHP) in conformance to the requirements of 10 CFR 851. The SLAC WSHP requires subcontractors to adhere to the applicable requirements contained therein and in SLAC's ES&H manual. This program is available at SLAC's Worker Safety & Health Program web site (<http://www-group.slac.stanford.edu/esh/general/wshp/>). Each subcontractor shall sign a WSHP Acknowledgment Form, thereby agreeing to comply with SLAC's WSHP. [Exception: A contractor who has their own DOE-approved WSHP.]

10 CFR 851.23 specifies regulatory requirements that must be followed and allows SLAC to add additional safety and health requirements deemed necessary to protect the safety and health of workers. In accordance with this statute, SLAC's construction subcontractors must comply with these specific safety and health standards:

- Title 29 CFR, Parts 1904.4 through 1904.11, 1904.29 through 1904.33; 1904.44, and 1904.46, "Recording and Reporting Occupational Injuries and Illnesses."
- Title 29 CFR, Part 1910, "Occupational Safety and Health Standards," excluding 29 CFR 1910.1096, "Ionizing Radiation."
- Title 29 CFR, Part 1926, "Safety and Health Regulations for Construction."
- Title 8, California Code of Regulations, "Industrial Relations", "Multi-employer Worksites" 8 CCR 336.10 – 336.11.

- Title 8, California Code of Regulations, “Industrial Relations”, “Construction Safety Orders”, “Injury and Illness Prevention Program”, 8 CCR 1509(a)
- Title 8, California Code of Regulations, “Industrial Relations”, “Construction Safety Orders”, “Code of Safe Practices”, 8 CCR 1509(b)
- Title 8, California Code of Regulations, “Industrial Relations”, “General Industry Safety Orders”, “Injury and Illness Prevention Program”, 8 CCR 3203.
- Title 8, California Code of Regulations, “Industrial Relations”, General Industry Safety Orders, “Heat Illness Prevention”, 8 CCR 3395.
- American Conference of Governmental Industrial Hygienists (ACGIH), “Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices,” (2005)
- American National Standards Institute (ANSI) Z88.2, “American National Standard for Respiratory Protection,” (1992)
- ANSI Z136.1, “Safe Use of Lasers,”
- ANSI Z49.1, “Safety in Welding, Cutting and Allied Processes,” sections 4.3 and E4.3
- National Fire Protection Association (NFPA) 70, “National Electrical Code,”
- NFPA 70E, “Standard for Electrical Safety in the Workplace,”
- Title 10 Code of Federal Regulations (CFR) 850, “Chronic Beryllium Disease Prevention Program.”
- DOE Order 232.2, “Occurrence Reporting and Processing of Operations Information (August 30, 2011)

Note: Current version of regulation or standard applies if version not otherwise shown.

Other regulations are listed at 10 CFR 851.23 which are *not* applicable to SLAC’s construction activities. It must be understood that 10 CFR 851 provides the basic foundation for a worker safety and health program and that subcontractors may need to go beyond these requirements in establishing programs to protect workers from hazards associated with their activities. Furthermore, it shall be noted that additional regulatory and SLAC requirements are mentioned in the remainder of this manual.

Resources:

[10 CFR 851, Worker Safety and Health Program](#)

3 SAFETY & HEALTH PROGRAM POLICIES

3.1 Purpose

This section describes the requirements and policies associated with identifying, controlling, and documenting hazards related to Subcontractor construction work activities. Specific procedures may be found in Section 4.

3.2 Regulatory and SLAC Requirements

Subcontractor shall identify, control, and document hazards associated with their work activities in accordance with the following requirements:

- SLAC Terms and Conditions utilized for this project
- SLAC's WSHP
- SLAC's ES&H Manual, Chapter 2, Work Planning and Control, and Chapter 42, Subcontractor Safety [applicable portions]
- Requirements listed in Section 2.2 above.

3.3 10 CFR 851 Worker Safety and Health Program

SLAC's WSHP is a mechanism for compliance with the requirements in 10 CFR 851. The subcontractors following all the requirements described in this SLAC Construction Project Safety Requirements Manual should substantially meet the applicable parts of the WSHP. The WSHP incorporates the DOE requirement for an Integrated Safety Management System (ISM). SLAC has also incorporated its Environmental Management System into ISM, thereby creating an Integrated Safety and Environmental Management System (ISEMS).

3.4 Integrated Safety and Environmental Management System (ISEMS) and Work Planning and Control (WPC)

Subcontractors shall incorporate the elements of SLAC's ISEMS into their work planning and control (WPC) activities. The subcontractor shall apply the core ISEMS functions as a continuous cycle. SLAC's WPC program adds the concepts of authorization and release to the standard ISM functions. The SLAC ISEMS elements, with the added WPC steps, are:

- **Define the Scope of Work.** Create or interpret drawings and specifications, statements of work, and project requirements, identify resources needed, create specific tasks/steps, set requirements and expectations, and identify and prioritize tasks.
- **Analyze the Hazards.** Identify, analyze, and categorize hazards and potential environmental, safety and health impacts associated with the work.
- **Develop and Implement Hazard Controls.** Identify and agree upon standards and requirements, identify controls to prevent/mitigate hazards, establish the ES&H parameters, and implement controls.
- **Authorize Work.** Affirmation by a supervisor that a worker is trained and qualified and has been informed of the hazards and controls of activities he or she has been assigned.
- **Release Work.** Acknowledgement that proposed work activities: do not interfere with programmatic or conventional facilities; have been coordinated with adjacent building /area managers, as appropriate; affected occupants have been informed of potential disruption or inconvenience; worker(s) have been informed of unique hazards, controls or limitations of the area; any boundary conditions have been communicated (see also authorization)
- **Perform Work Within Controls.** Confirm readiness and perform work safely and in the prescribed manner to protect workers, the public, and the environment.
- **Provide Feedback and Continuous Improvement.** Gather feedback on the adequacy of controls from workers and appropriate stakeholders, identify and implement opportunities for improvement, and conduct line management and independent oversight.

At SLAC, WPC is how ISEMS is implemented for all work performed at SLAC. All work must first be planned, then authorized, and finally released. All subcontractors, at any level, will follow SLAC's WPC program. **By following this Manual, subcontractors should meet the requirements of the SLAC WPC program. WPC is the use of formal, documented processes** for identifying and mitigating risks when planning, authorizing, releasing, and performing work. The purpose of WPC is to ensure adequate protection of workers, the public, and the environment, which would otherwise be put at risk by inconsistent and inadequate planning, authorization, and control.

WPC is used to identify the hazards associated with the work activities outlined in the Site Specific Safety Plan (SSSP) and eliminate or mitigate those hazards. The SSSP process is described in Section 4.4 below. WPC ensures the ISEMS elements are incorporated in the plans, permits, and other documents needed for each *definable work activity*.

3.5 Worker Training Policy

The Subcontractor shall ensure that all workers are trained in the tasks and activities (work) they may perform. Some activities may require a license or certificate to perform. The Subcontractor is required to provide that training and have personnel current in that training, at all levels. The Subcontractor shall provide evidence of the required training. See Section 4.6 for detailed training and documentation procedures.

3.6 Stop Work Authority (all personnel)

If unanticipated/unsafe conditions are identified or non-compliant practices are observed during construction activities, subcontractor staff shall be instructed to stop the work immediately and notify their supervisor and safety representative of this action. **All workers at SLAC sites have the authority to stop work.** These include SLAC personnel, DOE personnel, and subcontractor personnel, at any level. The subcontractor's staff, from PM to laborer, must implement their authority to stop work, when appropriate. Production should not supersede safety. See Section 4.12 for Stop Work Procedures and also see the Terms and Conditions for more information.

3.7 Incident / Emergency Response, Notification, and Investigation Policy

The Prime Subcontractor shall prepare a project-specific emergency plan and ensure they have personnel and resources to implement it effectively. The Prime Subcontractor shall report all emergencies immediately to 911 and also to SLAC Security. All other incidents and near misses, no matter how minor, shall be reported to the SLAC FCM and PM as soon as the scene is stabilized, but in all cases notification shall be made within thirty minutes of occurrence. This reporting time frame is necessary to ensure that SLAC can meet its DOE notifications obligations and that any necessary accident investigation, scene security, cleanup, traffic rerouting, etc. may promptly begin. Subcontractors shall assist the SLAC assigned personnel with any investigation and reporting as detailed in the Terms and Conditions. Specific procedures related to incident / emergency response, notification, and investigation may be found in Section 4.15.

3.8 Occupational Medicine Policy

Specific occupational medicine requirements apply to both Prime Subcontractors' and sub-tier subcontractors' activities if (a) the subcontractor's workers are on site for more than 30 days in a 12-month period; or (b) the subcontractor's workers on site are enrolled for any length of time in a medical or exposure monitoring program required by any rule or other obligation.

If the criteria above are met, the subcontractor shall establish and provide comprehensive occupational medicine services to workers on the site, as required in Appendix A.8. of 10 CFR Part 851—Worker Safety and Health Program.

Additionally, the Prime Subcontractor is responsible for the flow down of these requirements to their sub-tiers (at all levels) and for providing their occupational medicine services providers access to worksite hazard information.

Detailed information on implementing the Occupational Medicine program may be found in Section 4.14.

3.9 SLAC Site Rules and Prohibited Items

Refer to specification SECTION 013553 - SECURITY & SITE ACCESS PROVISIONS, for information on this subject including SLAC's right to inspect persons, personal articles, and vehicles. Violations will result in disciplinary action.

Resources:

[10 CFR 851 Summary](#)

[10 CFR 851 Regulation](#)

[SLAC's WSHP for Subcontractors overview](#)

Specification SECTION 013553 - SECURITY, SITE ACCESS AND BADGING PROVISIONS

4 SAFETY & HEALTH PROGRAM PROCEDURES

4.1 Purpose

This section describes SLAC's specific procedures for implementing the SLAC ISEMS and WPC programs on construction projects.

4.2 Prime Subcontractor Safety Pre-Qualification Process (Prior to Award)

Before a subcontractor can be awarded a construction contract, they must meet SLAC's safety qualification criteria. This is not a project-related review but rather an evaluation of a company's safety program and performance, so they can be qualified to bid on any work within their capabilities. The review is initiated by the submittal of a completed **Subcontractor Safety Qualification Form (SQF)**, along with all of the required supporting documents. Refer to the SQF for further information. The SLAC Subcontractor Safety Program Manager or their designee will determine if the submitted data, documents and programs are acceptable. The evaluation may result in acceptance, rejection, or conditional acceptance with required preventive actions or work scope limitations.

S&H Data Requirements:

[Subcontractor Safety Qualification Form](#)

4.3 Worker Safety and Health Program Acknowledgement (Prior to Award)

All subcontractors, at any level, shall fill out a **SLAC Worker Safety and Health Program (WSHP) Acknowledgement Form**. [Exception: A contractor who has their own DOE-approved WSHP.]

The subcontractor's signature on the form is their agreement that they understand and will follow the requirements of 10 CFR 851 and SLAC's WSHP. Complying with the requirements of this Manual should effectively result in compliance with SLAC's WSHP.

The Prime Subcontractor is responsible for indoctrinating sub-tiers and their employees to the elements of SLAC's (or their DOE-approved) WSHP and ensuring their compliance. At a minimum, the Prime Subcontractor will review the "SLAC WPC Summary for Subcontractors" is provided as a resource to aid this communication.

S&H Data Requirements:

[Worker Safety and Health Program Acknowledgement Form](#)

Resources:

[SLAC Work Planning and Control Summary for Subcontractors](#)

4.4 Site Specific Safety Plan (Post Award / Pre Notice-to-Proceed)

Each subcontractor, performing construction work at SLAC, is required to create and maintain a comprehensive, project-specific **Site-specific Safety Plan (SSSP)** for the project's duration. A **SSSP Content and Approval Form (SSSP Form)** shall be prepared by the Prime Subcontractor and the associated definable work activities list, safe work plans, JSAs, safe work permits, hazardous materials lists, SDSs, and training records shall be developed, compiled and maintained in the jobsite red project folder (Red Folder). Lists of plans, permits, and training records that may be applicable can be found on the SSSP Form. The prime subcontractor will submit their completed SSSP to the SLAC Project Manager (PM) for review and approval by the SLAC PM, FCM, and Field Safety Representative (FSR).

For all projects that include a Prime Subcontractor and one or more sub-tiers, there should initially be (a) a project-wide SSSP Form, (b) an SSSP Form for any self-perform scope of the Prime Subcontractor, and (c) an SSSP Form for any sub-tier that will be needed right away. Subsequent sub-tier subcontractors will submit their completed SSSPs to the Prime Subcontractor. In all cases, the SSSP Forms and attachments will be reviewed for completeness by the Prime Subcontractor and then will also be provided to the SLAC PM, FCM, and FSR for review and approval. All of the SSSP Forms and their attachments will constitute the **project Site-specific Safety Plan** and also satisfy the 10 CFR 851 requirement for a "construction project safety and health plan". The SSSP is a living document that shall be updated regularly. Also, the Prime Subcontractor shall routinely audit the Red Folder for completeness and accuracy. It shall be organized by subcontractor and type of record. The subcontractor shall be able to readily find any document/record which SLAC requests to review during the course of the project.

S&H Data Requirements:

[Site Specific Safety Plan Content and Approval Form](#)

4.4.1 Job Safety Analyses (JSAs)

The subcontractor must develop a JSA for each separately definable construction activity (e.g., excavations, foundations, structural steel, roofing, electrical, mechanical.) prior to commencement of the activity. A definable work activity is a task which is separate and distinct from other tasks and has separate control requirements. A definable work activity may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Within each definable work activity there may be other sub-phases of work which warrant separate JSAs. **It will be the**

responsibility of the Subcontractor to determine the best break-down of separately definable activities and the subsequent work steps in order to produce clear, concise, and effective JSAs. The Subcontractor JSAs shall be kept at the worksite, in the red folder, and available for review by SLAC.

A graded approach should be used to develop JSAs; however, the Subcontractor JSAs shall be developed in sufficient detail to preclude confusion and misunderstanding and shall be commensurate with the size, complexity and risk level of the construction project. When used appropriately, the graded approach will incorporate the appropriate level of rigor based on the hazards and consequences associated with each definable work activity.

The analyses shall contain and/or meet the following elements as applicable to the activity:

- Identification of the definable work activity
- Identification of the job steps for each work activity
- Identification of the foreseeable hazards for each step/activity and the planned protective measures including appropriate protective devices and/or equipment as needed
- Identification of competent persons required for workplace inspections of the construction activity
- Identification of actions to take in Emergency Response situations. (e.g., gas shutoff valve location, etc.).
- Address additional hazards revealed by supplemental site information (e.g., site characterization data, as-built drawings, site walks, etc.)
- Provide drawings and/or other documentation of protective measures for which applicable Occupational Safety and Health Administration (OSHA) standards require preparation by a Professional Engineer or other qualified professional
- Review and approval of the JSA by the Subcontractor's management
- Review and approval to the SLAC PM, FCM, and FSR prior to the start of work activities
- Places for signatures of the involved workers to signify that they have been briefed on and understand the requirements of the JSA, and acknowledge their intended compliance with the JSA. Attach additional signature pages as needed.

S&H Data Requirements:

[JSA form](#) Note: MS Word version available (see hyperlink at top of pdf).

4.4.2 Additional Plans/Permits Needed for this Project.

For this project, the following specific plans will be required (not a complete list – others to be determined by the subcontractor and SLAC during the preparation and execution of the project):

[EXAMPLES / PLACEHOLDERS]

Storm Water Pollution Prevention Plan (SWPPP) or Erosion and Sedimentation Control Plan - Refer to Section 013543 – ENVIRONMENTAL PROTECTION PROCEDURES

Dust Control Plan which complies with applicable requirements of the Bay Area Air Quality Management District (BAAQMD). Refer to SECTION 013543 – ENVIRONMENTAL PROTECTION PROCEDURES.

Traffic Control Plan for the project in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) 2012.

4.5 Notice to Proceed/Work Commencement

SLAC's Purchasing Department will issue the Notice to Proceed (NTP) after the Prime Subcontractor's SSSP is approved. Notwithstanding the NTP, subcontractors may not proceed with on-site work until the work planning and control requirements outlined in Sections 3 and 4 of this Manual are followed in coordination with the FCM.

4.6 Training and Documentation Procedures

- All subcontractor workers must obtain a SLAC subcontractor badge. There is specific SLAC training required to obtain the badge including Course 375, Construction Safety Orientation. The process and required training is explained in specification SECTION 013553 - SECURITY, SITE ACCESS AND BADGING.
- The Prime Subcontractor shall also conduct their own Worker Safety Orientation for each construction worker on the site. This shall be completed prior to the worker commencing on site work. This is required to ensure that the workers know the Subcontractor's safety requirements as well as SLAC's.

Bilingual Requirements: All Subcontractors shall ensure that bilingual supervisors and trainers are available as necessary for orientations, training, meetings and workplace supervision to ensure effective communication is maintained for "Non-English" speaking members of the workforce.

Bilingual ES&H posters, labels, signs and barriers shall be utilized as necessary to promote effective communication when members of the workforce are "Non-English" speaking.

- Superintendents, Foremen, and Safety Representatives must have completed:
 - OSHA 30-hour construction safety training

It is desirable that Subcontractor Safety Representatives have a professional certificate such as Construction Health and Safety Technician (CHST) or Certified Safety Professional (CSP).

It is also desirable that the Superintendents and foremen have a professional certificate such as Safety Trained Supervisor (STS).

- Additional certifications/licensing requirements may be required based on project-specific specifications as stated in the contract or as shown on the SSSP Form (e.g., certified electricians).
- For work activities in which specific training is required by safety regulations (e.g., OSHA mandated), the Prime Subcontractor shall maintain records on-site, showing proof of current training records for any particular qualified individual(s). In all cases, the employer shall provide a letter attesting to an employee's qualifications including why they are deemed "qualified" or "competent" and how they achieved this status. Designated "Competent Persons" are expected to have a higher level of experience, training and qualification.

Specific training evidence and letters will be required for at least the following: electricians (qualified electrical worker and NFPA 70e training), riggers, crane operators, respirator users, flaggers, forklift operators, scissor/boom lift operators, fall protection PPE users, asbestos or lead workers, fire watches, hazardous waste cleanup staff, confined space entrants/attendants/supervisors, heavy equipment operators, competent persons for excavations, competent persons for fall protection, scaffold erectors, those working in the heat, and those using specialized tools such as powder-actuated tools.

Photocopies of training certificates, certification cards, wallet IDs, etc. identifying the individual, the specific training, who conducted the training and the date completed (and/or expiration date) are accepted in lieu of originals. These documents will be kept with the project documents (Red Folder) and **are required before the worker can perform the work or task.**

- Prime Subcontractors shall provide close oversight of new workers to confirm competence and address any deficiencies immediately.
- SLAC Subcontractor Safety Management Training (Facilities Course 101)

This three hour in-person course is an orientation to SLAC's ES&H Program and Work Planning & Control Program. It is required for Prime Subcontractor superintendents/foremen, Prime Subcontractor safety representatives, and one sub-tier representative (superintendent and/or foreman) from the following trades: Mechanical, Electrical, Plumbing, Excavation/Underground Utilities, Steel Erection, Framing and Drywall. This training shall be repeated every three years.

Resources:

Specification SECTION 013553 - SECURITY, SITE ACCESS AND BADGING

Facilities Course 101, SLAC Subcontractor Safety Management Training

4.7 Lower-tier Subcontractors Screening / Selection / Performance

The Prime Subcontractor is responsible and accountable for the performance of sub-tier subcontractors at all levels. The Prime Subcontractor is responsible for selecting sub-tiers who will comply with all applicable regulatory and SLAC-specific requirements and effectively implement the SLAC WPC processes. The Prime Subcontractor shall exercise due diligence in the selection of sub-tier subcontractors just as SLAC exercised diligence in review of the Prime Subcontractor (see Section 4.2 above). Suggested considerations include stated and/or demonstrated commitment to injury prevention, qualifications/effectiveness of on-site leadership (e.g., foreman), and safety incident history.

4.8 Disciplinary Action

The Prime Subcontractor must have a disciplinary action process which will ensure worker's compliance with the SSSP. Minimum requirements include:

- A progressive disciplinary action plan which contains the appropriate corrective actions for workers who violate environmental, safety, and health requirements. An employee's failure to report incidents shall also be considered a safety violation. Incidents include events, such as a dropped load or a near-miss, even if no injury or property damage occurred.
- The Prime's right to accelerate the discipline including the possibility of immediate dismissal for serious acts or omissions. A list of examples that could lead to immediate dismissal, depending on the circumstances, shall be developed. The process must also contain appropriate guidelines that address durations for personnel banned from the project site.
- A communication plan that ensures all personnel understand the disciplinary program.

4.9 Safety Bulletin Boards

The Prime Subcontractor is responsible for installing and maintaining a safety bulletin board at the location where the majority of employees report to work. Workers shall be advised of the location of the nearest bulletin board. Employees shall be responsible for reviewing the bulletin board to keep informed of safety-related information. Safety bulletin boards shall be of sufficient size to display and post safety bulletins, newsletters, posters, accident statistics, and other safety educational material. At a minimum, the safety bulletin board shall display:

- DOE Occupational Safety and Health Poster DOE-F 5480.2 (Your Rights as a Worker)
- DOE Occupational Safety and Health Complaint Form 5480.4
- Requirements, provisions and number of the Employee Concern Program Hotline (Whistleblower Protection)
- Citations and notices as appropriate
- OSHA 300A form during February 1 to April 30
- SLAC-furnished safety bulletins and publications
- Stormwater discharge permit notice (as applicable)
- Emergency Procedures and Assembly Areas
- Location of Safety Data Sheets for hazardous materials

Suggested additional items to be posted include:

- Topical Safety & Health posters.
- Minutes of safety meetings.
- Information on accidents and Lessons Learned

S&H Data Requirements:

[DOE Contractor/Subcontractor WSHP Poster](#)

Bulletin Board contents (see above)

4.10 Safety Inspections / Tools and Equipment Inspections

The Prime Subcontractor shall implement a site safety inspection program including:

- Daily inspections.
- A weekly comprehensive inspection which is formally documented including findings and corrective actions taken.
- All tools and equipment must be inspected. Equipment inspections shall be documented on a tag or in a log/inspection sheet.
- Any identified defective or unsafe equipment, tools and/or worksite locations shall be immediately corrected, tagged/barricaded, removed from the jobsite and/or other effective interim control measures taken.

S&H Data Requirements:

- Inspection records – weekly comprehensive safety inspection; equipment inspections.

4.11 Weekly and Monthly ES&H Reports

Weekly ES&H reports shall be compiled and maintained as part of the project record and delivered to SLAC by each Tuesday for the previous week's activities. The report shall contain the following information:

- List of ES&H incidents (injuries, illnesses, first aids, property damage, fires, or near misses) for the week
- Listing of work hours, near-misses, incidents and incident statistics for the project "to-date"
- List of completed site inspections and corrective actions, or a link to their location
- List of initial or any daily inspections performed such as excavation inspections, hoisting and rigging inspections, and vehicle or equipment inspections or a link to their location
- List of any personal sampling results (data sheets, laboratory analytical results, exposure calculation sheets, and direct reading monitoring results/reports)
- List of workers (including company name/trade) that completed site orientation/briefing (orientation outline and sign-in sheets)

Monthly ES&H report

- Provide the onsite work hours for Prime/General Subcontractor and all subcontractors at any level, to SLAC by the 5th day of the month. These hours are for the previously worked month.

4.12 Stop Work Procedure

It is imperative that the Prime Subcontractor ensures that all workers at all tiers are made aware of the stop work policy (Section 3.6 above) and procedure at the worker orientation session and it is reinforced throughout the project. Stopped work may not proceed until the circumstances are investigated and deficiencies corrected. The work will be restarted after the activity's hazards have been mitigated, the changes captured in the job safety analysis (JSA) and Tailgate/Pre-job Release Form, and the activity/work has been re-released. The SLAC FCM, SLAC FSR, Prime Subcontractor superintendent, Prime Subcontractor safety representative, and the worker's, supervisor at the site, will perform the evaluation and determine the mitigations. The FCM, with concurrence from the FSR, accepts the

mitigations. If consensus is not reached between the FCM and FSR, the SLAC Project Manager for the work will be the final determinant. The Prime Subcontractor's superintendent and the worker's supervisor will communicate the changes to the workers and the workers will sign the amended Tailgate/Pre-job Release Form acknowledging their understanding of the changes and commitment to follow them.

4.13 Meetings and Work Coordination

Note: Some projects will not require every meeting listed here. Refer to Specification 01 31 19 – MEETINGS for the specific meetings applicable to a given project. Similarly, not all projects will necessitate the use of forms exactly as described below. The objective of the meetings, forms, and signatures described herein is effective work planning, work coordination, hazard mitigation, work authorization and work release. It is critical that this performance objective is met.

4.13.1 Pre-Start Safety Walkthrough

Immediately after bid award and prior to submitting a safety plan, the Prime Subcontractor shall schedule and participate in SLAC's pre-start job walkthrough to identify any hazards at the job site. All of these hazards, at a minimum, shall be addressed in the subcontractor's SSSP and the associated Job Safety Analyses. The subcontractor's attendees at this walkthrough shall include, but not necessarily be limited to: the subcontractor's superintendent, the subcontractor's project Safety Representative, and each of the principal foremen and/or sub-tier superintendents. The walkthrough should be accomplished within one full day.

4.13.2 Pre-construction Meeting [Pre-Kick-Off/Kick-Off]

SLAC will schedule this meeting after notice of award and prior to notice to proceed. This meeting is described in detail in SPECIFICATION 013119 - MEETINGS. A number of key contractual issues are covered in this meeting.

- The Prime Subcontractor's superintendent will present an overview of the Site Specific Safety Plan highlighting each definable work activity and the primary hazards and controls related to that activity.
- The superintendent shall also present which of these activities are expected to warrant a pre-installation/pre-mobilization meeting.
- The superintendent will describe the related safety plans and SLAC safety permits that are required.

4.13.3 Site Mobilization Meeting

Subcontractor shall schedule and preside over a meeting prior to mobilizing onto the construction site. Refer to specification SECTION 013119 – MEETINGS for more information.

4.13.4 Pre-Installation / Pre-Mobilization Meetings for Critical Definable Work Activities

When required in individual specification sections, in the Quality Control Plan, or as determined by the subcontractor or SLAC, the Subcontractor shall convene a pre-installation/pre-mobilization meeting prior to commencing certain critical definable work activities. Typically, such meetings will be required due to complexity, safety issues, the critical nature of a work activity, or simply to ensure the means and methods are clear and agreed upon. More information regarding these meetings can be found in specification SECTION 013119 - MEETINGS.

Resources:

Specification SECTION 013119 - MEETINGS

4.13.5 Daily Work Planning Coordination between FCM and Superintendent

For all projects, the FCM and Prime Subcontractor Superintendent should be communicating each day about the work planned for the following day. For large projects, the FCM and Prime Subcontractor Superintendent should **meet daily** to review the work planned for the next day. It is recommended that the FSR attend these meetings.

The Prime Subcontractor should identify all planned tasks on the **Daily Construction Work Review and General Contractor Release Form** while each sub-tier should document their planned tasks on a **Construction Tailgate/Release Form**. [Note: The Prime Subcontractor can use their own forms if deemed adequate by the FCM and Field Safety Representative. Also, the FCM and Superintendent can scale / customize how the forms are used, provided effective work planning, coordination, authorization and release are still realized.] The level of detail must be appropriate to define all tasks that may present a hazard to people, property or environment. The **JSA**s associated with the tasks shall be reviewed by the subcontractor as they prepare the daily forms. If the proposed activity does not have a corresponding JSA, then a new JSA will need to be developed and reviewed prior to the work being released.

The completed forms must be submitted by the Prime to the FCM for review against conflicting operations, regulatory hold points, required permits, and must include an acceptable level of detail. Once the FCM deems the information to be satisfactory, he/she will sign the **Daily Construction Work Review and General Contractor Release Form** thereby *releasing* the Prime to perform their own work tasks and oversee sub-tier tasks. This *release* is granted with the understanding that the Prime Superintendent will meet with all sub-tier foremen, either individually or in a group setting, and sign the sub-tier forms as the initial step in *releasing* the sub-tiers to perform their work scope.

S&H Data Requirements:

[Daily Construction Work Review and General Contractor Release Form](#) (release from FCM to Prime)

4.13.6 Daily Work Planning Meeting between Prime Superintendent and Sub-tiers

As described above in 4.13.5, the Prime Subcontractor is responsible for daily meeting with the sub-tier foremen, either individually or collectively, to review their work plans as presented on the **Construction Tailgate/Release Forms (or equivalent forms)**. When deemed acceptable, the Prime Superintendent will sign the **Construction Tailgate/Release Forms**, which is the initial step toward fully releasing each sub-tier to perform the tasks. The release will be completed with the Daily Tailgate/Work Coordination Meeting (see 4.13.7 below).

S&H Data Requirements:

[Construction Tailgate/Release Form](#) (release from Prime to sub-tier)

4.13.7 Daily Tailgate/Work Coordination Meeting

Each day all workers and their foremen, working on the project that day, must attend the project daily tailgate/work coordination meeting prior to starting their work activities. The Prime Superintendent shall present the major tasks outlined on the **Daily Construction Work Review and General**

Contractor Release Form while each foreman will, as appropriate, describe what they are doing and where, and the related hazards and controls as listed on their **Construction Tailgate/Release Form**.

The purpose of the meeting is to review critical steps of that day's work and engage the workers in a discussion of what can go wrong and what can be done to prevent a mishap. The meeting shall also address task coordination among trades and work groups, permits/plans in effect, and required inspections. The activities and tasks presented shall only include those released by the prime subcontractor's superintendent, as evidenced by his/her signature on each **Construction Tailgate/Release Form**.

At the end of the tailgate meeting, all workers must sign their company's **Construction Tailgate/Release Form** asserting their understanding of the day's work and associated hazards, and their commitment to implement the necessary controls. To finalize the work release, the sub-tier foreman will add his signature to the **Construction Tailgate/Release Form**.

No work may occur prior to the meeting and workers shall not commence with any work until they have attended the tailgate meeting and signed the **Construction Tailgate/Release Form**.

Subcontractors can structure the tailgate meeting in a manner that best supports their work processes. However, on large projects it is expected that all subtiers participate in this daily general meeting and that they also conduct their own daily tailgate meetings.

S&H Data Requirements:

[Construction Tailgate/Release Form](#) (release from Prime to sub-tier)

4.13.8 Safety Stewardship Meeting

This is a weekly meeting lasting approximately thirty minutes to discuss project safety issues. It will be led by the Prime/General Subcontractor's Safety Representative or designee. Required attendees include the prime subcontractor's project manager, superintendent, and safety representative. Additionally, any subtier superintendent or foreman as necessary or requested by SLAC shall attend. Representing SLAC will be the SLAC PM, FCM and FSR. A record of the subject and attendees will become part of the Project's reporting.

At a minimum, the Safety Stewardship meeting shall include:

- ES&H, health, and job-related issues/concerns related to the current and upcoming work scope (3-6 week look-ahead)
- New trades coming on board in next 3 weeks
- Summary of relevant lessons learned from SLAC and/or other construction projects, as applicable (e.g., other projects being run by the Prime Subcontractor, other DOE Lab projects, local area projects)
- As applicable, accident investigations conducted since the last meeting, to discuss if the cause of the unsafe acts or conditions were properly identified and corrected
- ES&H inspection findings since the last meeting
- Ad hoc ES&H or special emphasis training
- Other relevant ES&H subject matter as determined by the Prime Subcontractor or SLAC

4.14 Occupational Medicine Program Requirements

4.14.1 Applicability

The requirements of this section apply to all Prime Subcontractors' and sub-tier subcontractors' activities which require personnel to work on SLAC Sites if *either* of the two criteria applies:

- The subcontractor's workers are on site for more than 30 days in a 12-month period; or
- The subcontractor's workers on site are enrolled for any length of time in a medical or exposure monitoring program required by any rule or other obligation.

4.14.2 Regulatory and SLAC Requirements

The subcontractor shall establish and provide comprehensive occupational medicine services to workers on the site, as required in Appendix A.8. of 10 CFR Part 851—Worker Safety and Health Program.

Where applicable, subcontractors are required to submit health and safety plans that document compliance with these occupational medicine provisions. This documentation becomes part of the SSSP and is contained within the red folder.

4.14.3 SLAC Special Emphasis

The occupational medicine requirements of 10 CFR Part 851—Worker Safety and Health Program—are unfamiliar to many subcontractors. “Flow down” (transferring responsibility for compliance) of these requirements to sub-tier subcontractors tends to be irregular. Often, insufficient oversight is exercised to ensure high quality compliance. Further, subcontractors may overlook the need to inform their occupational medicine services providers of their responsibilities specified in 10 CFR Part 851—Worker Safety and Health Program. The following section details Subcontractor responsibilities to ensure compliance.

4.14.4 Subcontractor Responsibilities

The Prime Subcontractor is responsible for compliance with Appendix A.8. of 10 CFR Part 851—Worker Safety and Health Program, including: the accurate and timely flow down of these requirements to all of their sub-tier subcontractors, and, for ensuring that all of their sub-tier subcontractors comply with these requirements.

The Prime Subcontractor is responsible for providing their occupational medicine services providers and sub-tiers access to worksite hazard information.

- The subcontractor is responsible, in coordination with the SLAC project manager and FCM, to provide the occupational medicine services provider with access to the following:
 - Current information about actual or potential work-related site hazards (chemical, radiological, physical, biological, or ergonomic);
 - Employee job-task and hazard analysis information, including essential job functions;
 - Actual or potential work-site exposures of each employee; and
 - Personnel actions resulting in a change of job functions, hazards, or exposures.
- All subcontractors, at any level, shall notify the occupational medicine services providers when an employee has been absent because of an injury or illness for more than 5 consecutive workdays

(or an equivalent time period for those individuals on an alternative work schedule). The Prime Subcontractor will also inform the SLAC PM, FCM, and the FSR of an absence.

- Subcontractors shall notify the SLAC PM and FCM of any recordable work injury/illness that may occur related to work at SLAC National Accelerator Laboratory (medical treatment case, restricted time cases, lost time cases), and provide case updates with each work status update/change, including notification of case resolution, until the point of case resolution or the end of the contract at SLAC National Accelerator Laboratory.

All subcontractors, at any level, and the occupational medicine services provider are responsible for developing and maintaining a record, containing any medical, health history, exposure history, and demographic data collected for the occupational medicine purposes, for each employee for whom medical services are provided. All occupational medical records shall be maintained in accordance with Executive Order 13335, Incentives for the Use of Health Information Technology.

All subcontractors, at any level, are responsible for notifying the occupational medicine services provider of the requirements contained in Appendix A.8. of 10 CFR Part 851—Worker Safety and Health Program. The occupational medicine services provider and subcontractor are responsible for implementing with the following requirements:

- The occupational medicine services provider determines the content of the worker health evaluations
 - Workers shall be informed of the purpose and nature of the medical evaluations and tests offered by the occupational medicine services provider and
 - The occupational medical provider shall determine the necessary health evaluations.
 - Diagnostic examinations will evaluate employee's injuries and illnesses to determine work-relatedness, the applicability of medical restrictions, and referral for definitive care, as appropriate. After a work-related injury or illness or an absence due to any injury or illness lasting 5 or more consecutive workdays (or an equivalent time period for those individuals on an alternative work schedule), a return to work evaluation will determine the individual's physical and psychological capacity to perform work and return to duty. At the time of separation from employment, individuals shall be offered a general health evaluation to establish a record of physical condition.
- The occupational medicine services provider shall monitor ill and injured workers to facilitate their rehabilitation and safe return to work and to minimize lost time and its associated costs.
- The occupational medicine services provider shall include measures to identify and manage the principal preventable causes of premature illness affecting worker health and productivity.
 - Subcontractors, at any level, shall include programs to prevent and manage these causes of morbidity when evaluations demonstrate their cost effectiveness.
- The occupational medicine services provider shall review and approve the medical and behavioral aspects of employee counseling and health promotional programs, including the following types:
 - Subcontractor-sponsored or Subcontractor supported EAPs;

- Subcontractor-sponsored or Subcontractor supported alcohol and other substance abuse rehabilitation programs; and
- Subcontractor-sponsored or Subcontractor supported wellness programs.

4.15 Incident / Emergency Response, Notification, and Investigation Procedures

- **For all emergencies at the SLAC site the subcontractor shall contact 911 from a cell phone or SLAC phone.** After 911 has been contacted, the subcontractor shall:
 - Contact SLAC Security at (650) 926-5555 from a cell phone or dial 5555 on a SLAC phone
 - Contact the FCM at the number provided
 - Contact the Project Manager at the number provided
- The Prime Subcontractor shall prepare a project-specific emergency response plan. As part of their emergency plan, the Subcontractor must designate a member(s) of their staff, who has the authority and is capable of directing emergency response on the job-site. This individual will act as the communication point of contact for SLAC. This individual(s) will assist SLAC with specific site/building knowledge and communicating that knowledge to external agencies.
- The Prime Subcontractor must provide and identify the method for prompt notification to SLAC Security via landline or cell phone.
- A site map showing assembly points and directions to the Prime Subcontractor's authorized medical facility shall be posted on the project bulletin board or in the site project office. Upon award of the work, contact the SLAC FCM or FSR for electronic copies of building evacuation routes and assembly areas to include with the SSSP.
- The Prime Subcontractor shall report all incidents and near misses, no matter how minor, to the SLAC FCM and PM as soon as the scene is stabilized, but in all cases notification shall be made within thirty minutes of occurrence. This reporting time frame is necessary to ensure that SLAC can meet its DOE notifications obligations and that any necessary accident investigation, scene security, cleanup, traffic rerouting, etc. may promptly begin.
- Subcontractors shall assist the SLAC assigned personnel with investigation and reporting as stated in the Terms and Conditions, Article 19.

4.15.1 SLAC Resources During Incidents and Emergencies

In the event of a minor injury or illness, the SLAC Occupational Health Center (located in Bldg 28) is available to assist with initial evaluation and treatment without any cost to the subcontractor. The facility is staffed with a physician's assistant and nurse daily from 8 am – 5 pm. A doctor is also at the center periodically. The subcontractor may also request that these medical professionals respond to the construction site at the time of an incident. The SLAC Occupational Health Center can be contacted at (650) 926-2281.

Upon notification of an emergency situation, SLAC will provide notification to external and internal responders. Internal responders include: ES&H Construction POC's, Security & Emergency Response Team (ERT) personnel, and FCM/PM. External responders will typically include Menlo Park Fire Protection District, Woodside Fire Department, and/or the local ambulance service.

S&H Data Requirements:

Project-specific Emergency Response Plan

Resources:

SLAC Incident Reporting and Investigation Process

4.16 Additional Subcontractor Responsibilities

- Participate in the pre-proposal walk and ESH pre-award interview as requested
- Provide qualified supervisors and workers, including *superintendents/foremen*, *safety representatives* (if required by the project specifications), and *competent persons* when applicable. Refer to staffing requirements in specifications SECTION 010000 – GENERAL REQUIREMENTS.
- Comply with security, site access, and badging requirements per specification SECTION 013553 - SECURITY, SITE ACCESS AND BADGING.
- Complete requested ES&H submittals prior to the performance of the work. This includes, but is not limited to, an SSSP for each sub-tier subcontractor directly contracted to the prime
- Implement all WPC requirements, including a pre-job/tailgate/coordination briefing before beginning work
- Report any unmitigated hazards, concerns, or changes in conditions affecting safety. Sub-tiers shall report to the Prime Subcontractor's superintendent. The Prime Subcontractor shall report to the SLAC FCM. If immediate corrective action is not possible or the identified hazard is not addressed in existing pre-task plans, immediately notifies affected workers, posts appropriate warning signs, implements needed interim control measures, and notifies the SLAC PM and FCM of the action taken.
- Return SLAC badges and dosimeters (if issued) to the PM or FCM upon request at the end of the contract. Failure to return these items carries a financial penalty as described in the Terms and Conditions.

PART III: S&H FUNCTIONAL AREA REQUIREMENTS

This section provides regulatory and SLAC-specific requirements for specific functional areas such as electrical safety, excavation, and fall protection.

5 CONTROL OF HAZARDOUS ENERGY (COHE)

5.1 Applicability

The requirements of this section apply to all Prime Subcontractors' and sub-tier subcontractors' activities (i.e., constructing, installing, setting up, adjusting, inspecting, modifying and maintaining/servicing equipment) where the unexpected release of hazardous energy (i.e., electrical, hydraulic, pneumatic, chemical, thermal, compressed gases, mechanical & gravity) or startup of the machines, equipment, and systems could cause injury on SLAC Sites.

5.2 Regulatory and SLAC Requirements

The Subcontractor CoHE energy program and associated work activities where the unexpected release of hazardous energy or startup of the machines, equipment, and systems could cause injury shall be conducted in accordance with the following statutory and SLAC requirements:

- 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout)
- 29 CFR 1910.269, Electric Power Generation, Transmission, and Distribution
- 29 CFR 1910.333, Selection and Use of Work Practices (Electrical)
- 29 CFR 1926.416 – 1926.417, Safe Work Practices – General; Lockout/Tagout of Circuits
- NFPA 70e, Standard for Electrical Safety in the Workplace
- SLAC [ES&H Manual Chapter 51, Control of Hazardous Energy](#) (pertinent content explained below)

5.3 SLAC Specific Requirements and Procedures

In addition to Section 3.2, all work activities requiring the use of lockout/tagout shall meet the requirements, as applicable, in sections 5.3.1 – 5.3.4 of this Manual.

Key elements are summarized here and discussed in greater detail below:

- Hazardous energy must be controlled to prevent injury before performing installation, set up, maintenance, or repair. This includes electrical, mechanical, thermal, radiation, chemical, etc.
- Hazardous energy must be shutoff, residual energy must be dissipated, lock and tag applied, zero energy verified. Until all of these steps are completed, the energy shall be presumed to be present and appropriate precautions taken.
- **SLAC always locks and tags first and subcontractors overlock** using a multi-hasp adapter or lock-box. **Subcontractors shall not operate disconnects, breakers, or valves.** Subcontractors must plan ahead and allow sufficient time in their schedules for SLAC Facilities staff to perform the shutoff and initial lockout/tagout. Furthermore, the subcontractor must inform the FCM well in advance to ensure timely coordination.

- The Lead Authorized Worker for Group Lockout will always be a SLAC employee.
- Supervisor locks (one lock for a crew) are forbidden. Each worker must apply their own lock.
- **Contractor must have a written Control of Hazardous Energy program**; shall be submitted to SLAC for review.
- Workers must be trained in lockout/tagout procedures. Designation of competency / evidence of training shall be provided and included in the project red folder
- SLAC and subcontractor must discuss each other's lockout/tagout programs to ensure a consistent, well-coordinated, and safe approach is taken at all times.
- SLAC-specific forms are used for Group Lockout/Energy Isolation Plan and Complex Lockout Permit (sign on and off lockouts). SLAC will assist in preparation of the group lockout energy isolation plans and permits.
- **SLAC requires the general industry regulations 29 CFR 1910.147 and 29 CFR 1910 Subpart S to be followed on construction projects.**

5.3.1 SLAC Control of Hazardous Energy for Equipment and Systems

The Subcontractor's affected and authorized workers must understand and follow the applicable provisions of SLAC's and the Subcontractor's CoHE programs. Prior to conducting any work which requires lockout/tagout within an existing or under construction SLAC building or that interfaces with an existing SLAC utility system, the Subcontractor shall first notify the SLAC PM and FCM. This includes lockout/tagouts that occur during construction temporary and/or permanent electrical power tie-ins at the point of SLAC supplied power distribution. The SLAC PM and FCM shall control, coordinate and approve lockout/tagout work being conducted on this equipment/ systems and shall ensure that the Subcontractors are aware of and comply with the requirements of the SLAC CoHE program. **In all instances, any equipment that requires a lockout will first be locked and tagged by a SLAC authorized worker or operations group, then, when authorized by the Subcontractor supervisor, the Subcontractor's authorized workers will apply their personal LOTO locks.** The Subcontractor's Health and Safety Manual or Code of Safe Practices shall include the safety policies and/or procedures that govern their personnel's work requiring CoHE. These policies and/or procedures are submitted to SLAC with the Subcontractor Safety Qualification Form. The Prime Subcontractor shall ensure that their lower-tier Subcontractor's policies and/or programs meet SLAC's requirements.

5.3.2 Lockout/ Tagout Equipment

All necessary lockout/tagout equipment must be provided by the authorized worker's employer. Locks shall be uniquely identified and have only one key. The key must remain in control of the worker.

Lockout devices and tagout devices must be singularly identified; must be the only devices(s) used for locking and tagging energy isolating devices (for the purpose of control of hazardous energy during servicing and maintenance); must not be used for other purposes; and must meet the following requirements:

- Lockout and tagout devices must be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
- Lockout devices must be substantial enough so that they cannot be removed without the use of excessive force or unusual techniques (such as bolt cutters or other metal cutting tools).

- Tagout devices, including their means of attachment, must be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means must be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all environment-tolerant nylon cable tie.
- Tagout devices must be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.
- Tags must not deteriorate when used in a corrosive environment, such as in an area where acid or alkali chemicals are handled or stored.

5.3.3 Subcontractor Lockout/Tagout Inspection Procedures

As part of the weekly ES&H Report (Section 4.11), the Subcontractor shall ensure that weekly documented inspections are made for all active lockout/tagout applications. These inspections shall be kept at the jobsite and made available for review by SLAC.

The Subcontractor shall also perform daily informal (undocumented) inspections to verify lockout/tagouts remain in place and the information on the tag is legible.

5.3.4 Subcontractor Training Requirements

Subcontractors that are trained in accordance with the requirements identified in 29 CFR 1910.147, 29 CFR 1910.332 (b) and NFPA 70E Article 110, will be considered as meeting the necessary training requirements for working under lockout/tagout at SLAC. The Subcontractor shall provide proof of such training and attest to competency for each worker as part of the SSSP. The Subcontractor is required to provide qualified and competent persons at the job site.

5.3.5 Hot Tapping of Process Piping

Hot tapping is the use of specialized drilling equipment to tap into in-service, pressurized process piping for attaching a mechanical or welded branch fitting.

Hot taps, for which all of the following conditions are met, are exempt from CoHE requirements:

- Continuity of service is essential.
- Shutdown of the system is impractical.
- Documented procedures are followed.
- Special equipment is used that will provide proven, effective protection for workers.

Permission to hot tap a process system is limited to situations in which system shutdown is impossible (such as a leaking tank or other non-isolable leak) or where hot tapping is shown to be less hazardous than shutting down and locking out the system and performing a cold tap. In other words, the decision to hot tap must be safety-based. It must be shown that, on the whole, it is safer to perform the hot tap than to shutdown, depressurize, and lock out the system. (See [Control of Hazardous Energy: General Requirements](#) for approval requirements.)

5.4 SLAC Special Emphasis

5.4.1 Zero Voltage Verification Procedure (ZVV)

SLAC Qualified Electrical Workers will perform ZVV for all Subcontractor lockouts. Subcontractor workers can observe the ZVV to verify zero-voltage, perform their own ZVV, or can accept the completed energy isolation plan as evidence of zero-voltage. However, workers shall be sure to comply with their own company policies.

5.4.2 Applying Lockout/Tagout

Each exposed Subcontractor worker shall apply their own lock and a properly completed tag to secure the energy source(s) prior to beginning work activities. **When more than one individual is working on the same piece of equipment or project, a group lock box or multi-lock hasps (gang hasp) shall be used and each worker shall apply his or her lock and tag. A SLAC lead authorized worker shall be responsible for the group lockout. Workers shall not rely on another person's lockout for protection.**

S&H Data Requirements:

Control of Hazardous Energy (LOTO) Program
Group Lockout/Energy Isolation Plan
Complex Lockout Permit (sing on and off lockouts)

6 ELECTRICAL SAFETY

6.1 Applicability

The Prime Subcontractor shall be responsible for the development and implementation of an **Electrical Safety Program** to be followed throughout all phases of the construction project and this program shall apply to all Prime Subcontractors and sub-tier subcontractors' activities performed at SLAC. A separate written Electrical Safety Program can be utilized or these procedures can be embedded in the Prime Subcontractor's Health and Safety Manual or Code of Safe Practices. The written Electrical Safety Program shall meet the requirements of NPFA 70e. The program shall address inspection of equipment, shock and arc flash hazard analysis, boundary conditions for energized electrical work (including testing), personal protective equipment selection, training, and other appropriate topics.

These policies and/or procedures are submitted to SLAC with the Subcontractor Safety Qualification Form. The Prime Subcontractor shall ensure that their sub-tier subcontractor's policies and/or programs meet SLAC's requirements.

6.2 Regulatory and SLAC Requirements

The Subcontractor electrical safety program shall be conducted in accordance with the following statutory requirements:

- 29 CFR 1926, Subpart K, Electrical
- 29 CFR 1910.333, Selection and Use of iWork Practices
- 29 CFR 1910.147. The Control of Hazardous Energy (Lockout/Tagout).
- NFPA 70E, Standard for Electrical Safety in the Workplace
- SLAC's [ES&H Manual Chapter 8, Electrical Safety](#) (pertinent content explained below)

Note: Whenever there is a conflict between any requirements contained or referenced in this chapter, the most stringent requirement shall apply. Contact the SLAC PM, FCM, and FSR for assistance.

6.3 SLAC Specific Requirements and Procedures

Note: SLAC does not allow energized electrical work.

In addition to Section 6.2, the Subcontractor electrical safety program shall meet the following SLAC requirements.

6.3.1 General Electrical Work Safety Requirements

Subcontractors shall identify the electrical hazards associated within each definable feature of work and establish the controls necessary to maintain an acceptable level of risk. To assist in the evaluation of electrical hazards, Subcontractors shall employ an **Electrical Hazard Analysis** consistent with requirements of NFPA 70E, Standard for Electrical Safety in the Workplace for shock and arc flash hazards. **The identified hazards and control measures shall be documented in an Electrical Work Plan (EWP; SLAC-I-730-0A11R-002, most recent revision) or a JSA.** A Method of Procedure (MOP) may be prepared by the subcontractor in place of an EWP. If the subcontractor intends to use a MOP, it shall be reviewed and accepted by the SLAC FSR or Electrical Safety Officer. Usually, a SLAC staff person will develop an EWP based on the MOP. The subcontractor develops the JSA. Note: SLAC has completed arc flash studies for all existing facilities and applied labels with the shock and flash hazard information. During new construction, the Subcontractor and SLAC will coordinate to ensure these analyses are completed prior to energization thereby ensuring workers have the necessary hazard information.

No energized electrical work other than energized testing and troubleshooting is allowed. The safe electrical work practices that are employed for energized testing/troubleshooting shall prevent electric shock, burns, arc flash or other injuries that could result from either direct or indirect electrical contact. This may include specialized training, observing required approach distances, and the use of appropriate personal protective equipment (PPE) consistent with the requirements of NFPA 70E. All other electrical work is performed under lockout/tagout. **It is important to remember that during zero voltage verification the circuits must be treated as energized and workers shall be protected accordingly.**

Subcontractors are responsible for identifying, providing and maintaining their own PPE. Maintenance of PPE includes the required testing and certification. Records of such testing shall be made available for review.

PPE appropriate to the hazard present shall be used. Electrical PPE may include:

- Insulated gloves; Hearing protection; Eye and face protection; Non-conductive headgear; Arc-Flash protective clothing as required by NFPA 70E; Hot-sticks and insulated tools.

6.3.1.1 Breakers and Disconnects

- **SLAC electricians will operate all circuit breakers and disconnects for the Subcontractor once the equipment has been connected to SLAC's electrical system.**

6.3.1.2 Qualified Electrical Worker

Only qualified workers who maintain the necessary skills and knowledge related to the construction and operation of electrical equipment, and the associated hazards are permitted to work on

electrical systems at SLAC. A **“Qualified Electrical Worker”** is a person who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training on the hazards involved. Such a person is familiar with the proper use of precautionary techniques, personal protective equipment, insulating and shielding materials, insulated tools, and test equipment in addition to SLAC specific procedural requirements. All Qualified Electrical Workers are required to have a letter from their employer asserting the employee’s knowledge/training per NFPA 70E 110.2 and 29 CFR 1910.332 (b)).

In addition, all Subcontractor journeyman electricians shall be certified electricians in the State of California.

Apprentice electricians shall be registered with the state as “electrician trainees” or enrolled in a state-approved apprenticeship program. Apprentices must work under the supervision of a Journeymen Electrician and shall have received the appropriate electrical safety training prior to their being assigned work that involve electrical hazards. It is the responsibility of the Journeymen Electrician to assign work that is appropriate for the apprentice's experience, skill level, and training.

6.3.1.3 Ground Fault Circuit Interrupter (GFCI) Protection

Subcontractors shall ensure that GFCIs are used on 120-volt circuits as specified below:

- In damp or wet (standing water) work areas
- For temporary power (e.g., extension cords) during construction, remodeling, maintenance, repair or similar activities (Note: outdoor receptacles shall be enclosed with weatherproof extra-duty covers
- When using portable, electric hand tools and equipment with cord/plug connectors

The users of the GFCIs shall test portable GFCIs using the test button provided before each use. If the GFCI fails the test, tag out of service with a “DANGER — DO NOT USE” tag and (if portable) remove from service. Do not reset or operate facility circuit breakers. Contact the SLAC PM or FCM for assistance.

6.3.1.4 Flexible Cords and Cables

Use UL-listed flexible cords suitable for conditions of use and location of use. Flexible cord sets used with grounding-type equipment shall contain an equipment grounding conductor. Protect flexible cords and cables from damage. Make a concerted effort to route cords in a manner that minimizes trip or snag hazards. Maintain clear walking aisles as much as possible. When possible, hang extension cord sets appropriately in the overhead to avoid tripping hazards and damage caused by foot traffic and equipment. Avoid sharp edges, pinching, or improper storage. Daisy chaining of extension cords or power strips is not allowed. See Table 3 for requirements. Cube taps are not allowed. Cords sets that are damaged shall be removed and discarded or repaired by a qualified person.

6.3.1.5 Electric Tool Use

Use only tools that are of an approved, double-insulated type and/or grounded. Use tools only in conjunction with an approved ground fault circuit interrupter (GFCI). Do not use any tool with a

damaged or exposed cord or exposed wiring. Check cords regularly for fraying, insulation damage, insufficient strain relief, and missing or damaged ground pins. Protect cords from damage.

6.3.2 Lockout/Tagout

In all instances, any equipment that requires a lockout will first be locked and tagged by a SLAC authorized worker or operations group, then, when authorized by the Subcontractor supervisor, the Subcontractor's authorized workers will apply their personal LOTO locks

6.3.3 Energized Electrical Work

Energized electrical work is not allowed at SLAC.

Exception: Taking voltage, current measurements and verification of zero energy using standard test equipment such as voltmeters and current probes is permitted on energized electrical systems. No other tools can be utilized on or near the energized parts. All other hazard identification, control and PPE requirements continue to apply.

S&H Data Requirements:

Electrical Work Plan (<http://www-group.slac.stanford.edu/esh/forms/ewp.pdf> or <http://www-group.slac.stanford.edu/esh/forms/eew.doc>)

Electrical Safety Program: Standalone document or information embedded in the Subcontractor's Health and Safety Manual or Code of Safe Practices

7 TEMPORARY POWER

Refer to specification SECTION 015000 – TEMPORARY FACILITIES AND CONTROLS.

8 ELECTRICAL ENERGIZATION and ELECTRICAL DEMOLITION

8.1 Electrical Energization Plan

The safety requirements for electrical energization of new equipment and systems are provided in this section.

A readiness review must be performed for major projects that install new or modify existing electrical distribution systems. This includes:

- Installation of new substations (e.g. cryoplant 12 kV substation, substations K2/K3/K4 replacement)
- Replacement of or major modification to existing substations (e.g. MLVR K-sub upgrades)
- Installation of new building power distribution systems (e.g. B053 SUSB, Cryoplant)

The project manager or electrical safety officer may also require a readiness review for complex installations or installations that require a high degree of formality when executing the energization plan. This includes:

- Re-introducing electrical energy into facilities that had been placed in "cold and dark" status (e.g. repowering Sectors 0 – 10 following LCLS II equipment removal project)

- Whenever the energization process may present a significant hazard to personnel or the facility, or present a risk to SLAC operations

If an energization readiness review is performed the general and electrical subcontractors must participate in the readiness review process.

The Subcontractor shall prepare an Electrical Energization Plan that complies with the following SLAC requirements. The Subcontractor should incorporate preparation and execution of the energization plan into the project schedule.

Note: Prior to connecting the new installation to electrical power, work on electrical circuits and equipment does not require lockout/tagout. After the new installation is connected to the electrical supply, work on electrical circuits and equipment must be performed under the SLAC CoHE/LOTO program.

Installation of new electrical circuits and equipment shall be substantially complete prior to first energization. The SLAC project manager or designee must present to the review team evidence of satisfactory completion of all required items called out below (as applicable):

- All main switchgear and main switchboard or Main MCC incoming and outgoing feeders must be terminated at both ends
- All NEC required working space shall be clear of tools, materials and other objects
- NEC required dedicated space shall have leak protection installed, if required
- All electrical enclosures shall be intact with all covers installed and doors closed and locked.
- Electrical room doors shall be locked with entry restricted to authorized personnel only
- SLAC review of electrical analyses must be complete with comments incorporated
- All required arc flash hazard labels must be affixed
- All required testing/commissioning activities for equipment to be energized must be complete and associated test reports reviewed and accepted by SLAC
- SLAC BIO inspection of equipment to be energized must be complete with no significant open items
- SLAC F&O inspections of electrical equipment to be energized must be complete with no significant open items
- All equipment hazard labels shall be affixed
- All equipment ID labels shall be affixed
- All exposed conductor ends must be safed-off to eliminate exposed copper¹.

Exception: Exposed conductor ends in an active work location where electrical workers are restricting access to the conductor ends need not be safed off. However when work moves to a differently location the remaining exposed ends, if any, must be safed off.

¹ If conductor ends are not safed-off and workers encounter de-energized exposed copper, the following actions are required: 1) pause work, 2) contact the SLAC FCM or SLAC electricians to locate the other end of the conductor(s); and, 3a) if terminated at a source of power then lock out and ZVV the exposed copper and safe off the conductor ends, or 3b) if not connected to an energy source then it's not hazardous, safe off the conductor ends and resume work. Note: this is a highly inefficient process that will delay work and increase cost. Ref. OSHA 1910.333(b).

- Subcontractor shall maintain up-to-date marked up top-level electrical drawings at the jobsite. These marked up drawings shall be made available to all SLAC and subcontractor workers for their use planning lockouts in support of construction activities
- All subcontractor LOTO training must be complete
- LOTO training records for all electrical workers must be verified by the SLAC FCM
- When conditions that trigger a readiness review are met, a communication plan to inform stakeholders of the proposed change in state from de-energized to energized must be prepared. Communication plan stakeholders include:
 - SLAC PMs, PEs, FCMs, field safety personnel, electrical safety officer, equipment owners/custodians and area managers
 - General and electrical subcontractor personnel

The communication plan must be included in the readiness review. The communication plan must be executed prior to commencing energization.

- Safety tailgate materials for the energization work plan and for commencement of work subsequent to energization shall be prepared by the subcontractor and approved by the SLAC FCM and field safety representative. If a readiness review team has been established the safety tailgate materials must be included in the readiness review.
- The general contractor shall certify to the SLAC PM prior to commencing energization that all pre-energization requirements have been satisfied.

8.2 Connection to Existing SLAC Utilities




The Subcontractor shall prepare and submit to SLAC for approval plans for connection to existing SLAC utilities. These plans must be compliant with the Section 5, Control of Hazardous Energy, of this manual. Plans shall be developed for all affected SLAC utilities including Mechanical, Electrical, Plumbing, Fire Protection (MEPFP) systems/infrastructure for tie in and/or during excavation within 18" of any live utility. The Subcontractor will incorporate the details of these plans into the CPM schedule. The Subcontractor will update these plans at each additional design submittal as necessary. This plan will be provided to the pertinent subcontractors as part of the bid package.

The Subcontractor will work with the AE to coordinate the design with the utilities isolation plan(s). Any modifications to the design shall also consider the maintainability of the systems and shall minimize the required shutdown of equipment critical to the science mission during routine maintenance.

8.3 Electrical Demolition

Electrical demolition activities require rigorous planning and focused attention during execution to ensure workers are protected from hidden or unanticipated hazardous energies. This is particularly true for electrical demolition in which hidden conditions could result in incomplete energy isolation. Errors created during design and construction of the equipment to be demolished are especially difficult to identify. To address these concerns all electrical demolition must comply with SLAC requirements (refer to SLAC [ESH Manual Chapter 51 Control of Hazardous Energy](#)):

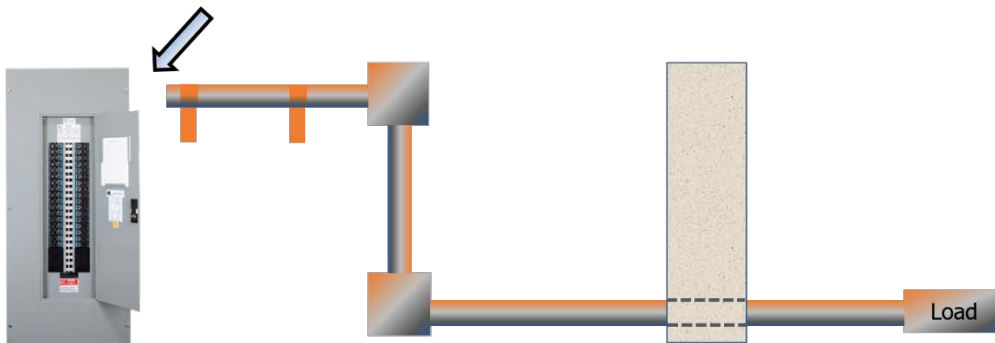
Demolition Area Color Code

- | | |
|---|---|
|  | DANGER: Conduit and equipment containing energized circuits not to be demolished must be flagged with red danger tape. |
|  | CAUTION: Conduit not to be demolished must be flagged with yellow caution tape or blank yellow tape (no text). |
|  | SAFE FOR DEMOLITION: Conduit and equipment to be demolished must marked or flagged with blank orange tape (no text) or orange paint or both. |

Electrical Demolition Requirements:

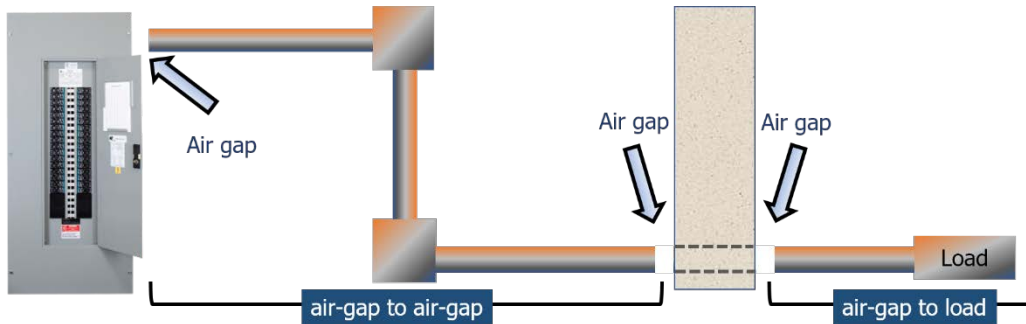
1. Each demolition project is unique and must be planned accordingly.
2. Electrical demolition must be based on approved design documents.
3. SLAC electricians will perform establish a group lockout for the demolition project.
4. Conduit and equipment to be demolished will be air-gapped at the source by SLAC.

SLAC electricians will air-gap the source of supply



5. Tracing, flagging and marking of equipment in the demolition are will be performed by SLAC:
 - a. SLAC will lockout to the extent feasible circuits that are within the demolition area but are not to be demolished. These circuits will be conspicuously flagged with YELLOW tape.
 - b. SLAC will flag with RED DANGER TAPE any circuits in the demolition area that are in service and energized.
 - c. Conduit and equipment to be demolished will be conspicuously marked or flagged by SLAC with ORANGE paint or blank ORANGE tape or both.

- d. Conduit that penetrates a wall, floor, or ceiling must be traced by SLAC using established tracing methods to confirm continuity of the conduit through the structural member.
 - e. Conduit that passes behind an obstacle or group of obstacles such as an HVAC duct, process piping, or other equipment must be traced by SLAC using established tracing methods to confirm continuity of the conduit as it passes behind the obstacle
6. Conduit to be demolished by subcontractors must be 100% visible within the demolition area. SLAC will create additional air-gaps for conduit segments that pass through walls, floors, or ceilings, or behind obstacles.



- 7. Subcontractor workers must join the demolition area lockout prior to commencing work.
- 8. As part of the pre-job briefing/safety tailgate, subcontractor workers must walkdown the entire demolition area with SLAC electrical workers to confirm marking and flagging.
- 9. Subcontractors must demolish the visible portion of conduit from air-gap to air-gap or, at the end of a circuit, from air-gap to the load served by the circuit.
- 10. No circuit, device, conduit, wiring or equipment may be demolished unless the demolition worker has 100% certainty the circuit elements are safe for demolition.
- 11. Use double-insulated tools when cutting conduit.
- 12. Cut conduit at or near orange flags or markings to reduce the likelihood of cutting the wrong conduit.

Stop Activity Conditions

- 1. If you or any coworker do not have 100% certainty that a circuit is safe for demolition
- 2. Unexpected circuits, hazards or other conditions are encountered
- 3. There is a change in or departure from plans
- 4. Work has not been properly released
- 5. Circuits and equipment in the demolition area have not been marked as expected
- 6. Circuits and equipment to be demolished have not been air-gapped as expected
- 7. Guidance is not clear
- 8. Roles or responsibilities are not clear
- 9. If you or any coworker have a “gut feeling” something is not right

9 PENETRATIONS

9.1 SLAC Specific Requirements and Procedures

Subcontractors are required to obtain a penetration permit, Class 1 or Class 2 prior to performing any surface penetration. A Class 1 penetration is defined as any penetration into hollow walls, hollow ceilings, or hollow floors, or a penetration into solid materials to a depth of 2 inches or less. A Class 2 penetration is defined as a Class 1 penetration deeper than 2 inches or all the way through solid materials. All penetrations within a radiologically controlled area (RCA), a radioactive material management area (RMMA), or part of radiation shielding (for example, the Accelerator Housing Structure, Klystron Gallery Floor, etc.) require a penetration permit with the “Radiological Safety” section of the permit completed by the Radiation Protection Department. Contact the SLAC FCM for assistance with this permit. Allow 3 days for review of this permit.

Note: No penetration work can occur until either a Class 1 or Class 2 permit has been approved for the work. The approved permit shall be kept at the jobsite until the work is completed. Mark that the work was completed on the permit; provide the completed permit to the FCM.

9.2 SLAC Special Emphasis

A thorough evaluation will be made to identify all hazards and utilities located behind or under surfaces. Measurements, detection equipment, and other means to identify these hazards will be used. Area, building, and space drawings will be used to assist in identifying these hazards. If a hazard is detected that is not on the drawings, a redline mark-up of the hazard will be made on the Subcontractor’s drawing set. If the penetration is to be made into a solid load-bearing wall, use NDT before performing the penetration to ensure that it does not interrupt wall reinforcement.

For new construction, the Subcontractor shall develop a plan with the FCM for how the SLAC Penetration Safety program will be implemented in reasonable fashion as walls are enclosed.

S&H Data Requirements:

[Penetration Permit](#)

10 EXCAVATIONS

10.1 Applicability

The requirements of this section apply to all Prime Subcontractors and sub-tier subcontractors conducting excavation operations and related activities at SLAC.

10.2 Regulatory and SLAC Requirements

All Subcontractor excavation activities shall be conducted in accordance with the following requirements:

- 29 CFR 1926, Subpart P; Excavations
- 8 CCR 1539–1947, Excavations
- California Water Code, WC 13700-13806
- San Mateo County Code, Title 4, SMCC 4.68.010-4.68.420

- California Building Code, 24 CCR Part 2, Chapter 32 and 33
- SLAC ES&H Manual Chapter 11 (pertinent content explained below)

10.3 SLAC Specific Requirements and Procedures

- **A SLAC excavation permit is required when any of the following conditions are met: excavating (digging or drilling) to a depth of one foot or more; power tools are used; utilities are identified or suspected in the area of the excavation; and any hazardous condition is likely to be encountered.** An excavation starts once the ground, surface, at grade, or other material is removed from the area or building. Note: SLAC uses an internal excavation permitting and notification system as opposed to a State of California process.
- **A written excavation plan shall be prepared for any excavation 5 feet or more in depth. The plan shall** describe methods of identifying utilities, exposing utilities, benching, shoring, placement and disposal of spoils, location of heavy equipment, excavation egress, and fall protection considerations adjacent to the excavation. If the shoring plan varies from pre-engineered shoring system standards, a civil or structural engineer, registered in the State of California, shall prepare the plan and provide his registration stamp on it. Similarly, if the depth is 20 feet or greater, a registered civil or structural engineer is required to design the shoring and stamp the design.
- **For excavations that are 6 feet deep or greater, fall protection shall be provided** adjacent to the opening if construction workers will have to work adjacent to the opening. If flag lines or barriers are used to prevent workers from approaching closer than 6 feet from the edge of the excavation, then further protection is not required. Walkways over excavations 6 feet or more in depth shall be provided with guardrails.
- If the excavation is accessible to non-construction personnel, fall protection is required for depths of 30 inches or more.
- Where vehicle traffic crosses trenching operations, provide metal plate coverings to support all motor vehicles. Adequacy of the metal plate to support traffic loads is the responsibility of the Subcontractor. The perimeter of trench plates shall have asphalt patch to create a smoother transition from roadway to trench and reduce the likelihood of plates shifting when vehicles approach them.
- In areas of high population density and high pedestrian traffic, special open-trench barricades and protection shall be provided. For open trenches adjacent to occupied buildings, crossing pedestrians, crosswalks and paths, at street intersections, and crossing or adjacent to sidewalks and driveways, open-trench protection as specified in the Manual for Uniform Traffic Control Devices (MUTCD) shall be provided.
- Open trenches/excavations entirely within construction zones and not near occupied areas as described above, shall be demarcated with stanchions and red danger tape or stanchions and tape flags.
- The Subcontractor shall convene **a pre-mobilization meeting** to review the excavation plan with SLAC.
- Refer to Section 19, Heavy Equipment Operation, for general safety related to equipment operation.

- Mobile/portable drilling rigs will be inspected by SLAC before they can be used.

10.3.1 SLAC Excavation Permit

The SLAC FCM will assist the Subcontractor with completing the excavation permit and submitting it for approval. Upon submittal, 10 working days are required for its review and signatures. If soil testing is required, an additional 14 days may be required. An underground location survey is required as part of the excavation permit submittal; see section 10.3.2. Excavations shall commence within 90 days of the permit being issued or the permit will expire and need to be re-issued.

10.3.2 Locating Underground Utilities

The Subcontractor will have a utility location survey performed of the area in which the excavation is to be performed. SLAC as-built drawings will be used as a reference for the excavation area. The area surveyed will extend three feet past the limit of the proposed excavation. All effort will be made to identify any utilities in the proposed excavation area. Any differences will be marked on the SLAC as-built drawings and the drawings will be submitted back to SLAC as part of the excavation permit. The utility locator will follow the utility marking requirements and complete the utility location results form.

Maintenance of utility markings is critical throughout the excavation process; consideration shall be given to the use of flags if painted pavement or dirt markings are removed as the work progresses.

10.3.2.1 Pot Hole Verification

The FCM shall work directly with the Subcontractor who will hand dig or otherwise safely "pot hole" (daylight) to verify location and depth of the various utilities which may conflict with the excavation activity. **No machinery may be used within the exclusion zone; hand digging or specialized potholing equipment such as vacuum excavating or hydro and vacuum excavating combined is only allowed. The exclusion zone is defined as the outer circumference or the outer edge of the utility plus 18 inches, vertically and horizontally.**

10.3.3 Confined Spaces

When the configuration of an excavation is such that the excavation is deemed to be a confined space, applicable confined space regulations shall be followed. See section 17.

10.3.4 Oversight During Excavations

The Prime Subcontractor shall assign someone to be physically present during excavations that are within 5 feet of underground services to ensure compliance with the approved plan.

10.3.5 Competent Persons Requirements

The Subcontractor is required to provide a qualified and competent person at the job site when excavations work is ongoing. The Subcontractor shall ensure that the "Competent Person" can demonstrate that their knowledge and skill-sets match the excavation and protective system(s) that are in place. Subcontractor excavation Competent Persons that are trained and knowledgeable about soils analysis, the use of protective systems, identification of existing and predicable excavation hazards and the requirements of 29 CFR 1926, Subpart P, Excavations, will be considered as meeting the necessary excavation competent person training for working at SLAC. The Subcontractor shall provide proof of such training. This proof will become part of the SSSP.

10.3.6 General Awareness Training Requirements

All Subcontractors working in or around excavations shall receive general excavation hazards awareness training. Evidence of this training will become part of the SSSP and maintained onsite.

S&H Data Requirements:

[Excavation Permit](#)

[Utility Location Results Form](#)

[Excavation Daily Inspection Checklist](#)

[Mobile/Portable Drilling Rig Initial Inspection](#)

10.4 SLAC Special Emphasis

10.4.1 Lockout/Tagout of Underground Utilities

Within 3 feet (in all directions) of the excavation boundary, all underground electrical and piping systems shall be shutoff and locked out in accordance with standard lockout/tagout procedures (refer to Section 5 of this manual.) This includes relieving stored energy (e.g., pressure in a pipe).

Exceptions to this requirement may be granted on a case by case basis with the approval of both the Facilities & Operations Director and the Chief Safety Officer.

10.4.2 Heavy Machinery Use Around Utilities

Excavating with heavy machinery (e.g., excavator, backhoe) is not allowed within an exclusion zone (comprised of the width of the utility plus 18 inches in all directions, as measured from the outside circumference or outer edge of the utility) around a known utility.

10.4.3 Discovery of Unknown or Unanticipated Utilities

After commencing with excavation, if an unknown or unanticipated utility is identified, work will be stopped. The work will be re-planned (with assistance from the FCM and FSR). The excavation permit and plan will be revised and the work re-approved by the SLAC Program Manager. Furthermore, the work plan will be re-approved and re-released by the FCM and subsequently by the Prime Subcontractor to the subcontractor performing the excavation.

10.4.4 Excavation Competent Person

An excavation competent person must be present during active operations and inspect the excavation daily. Evidence of the inspection will become part of the SSSP documentation.

10.4.5 Utility Location Marks

Work shall not proceed if the utility location marks are not clearly visible. If surface markings are or will be removed, then alternative marking such as stakes and flags shall be used.

10.5 Subcontractor Responsibilities

The Subcontractor shall be responsible for the following:

- Obtaining an approved SLAC Excavation Permit.
- Preparing a written Excavation Plan (for depths of 5 feet or more) for review and approval by SLAC.

- Implementing the approved Excavation Plan. Stopping work as needed if unexpected conditions are encountered.
- Arranging, in coordination with SLAC, a pre-mobilization meeting to review the excavation plan.
- Monitoring/daily inspections of excavation, trenching and shoring operations.
- Designating a Competent Person, who has had the training to act in this position; providing the competent person the authority to effectively discharge their duties.
- Ensuring the requirements of this section are effectively communicated and enforced to lower tier sub-contractors.
- Investigate and report to the SLAC Project Manager, FCM, and FSR all incidents, including any near miss, involving excavations, trenching and shoring.

11 FIRE AND LIFE SAFETY

11.1 Applicability

The general fire prevention and protection aspects of this section apply to all projects and the Hot Work requirements apply to many projects. SLAC has very specific requirements with regard to fire prevention and protection. In all cases, the Prime Subcontractor shall ensure that all subtiers know, understand and comply with these requirements.

11.2 Regulatory and SLAC Requirements

The Subcontractor fire protection & prevention program shall be conducted in accordance with the following requirements:

- 10 CFR 851
- NFPA Standards
- California Fire Code (current version)
- 29 CFR 1910 Subpart L, Fire Protection
- 29CFR1926.24, Fire Protection & Prevention
- 29 CFR 1926, Subpart F, Fire Protection & Prevention
- 29 CFR 1926, Subpart J, Welding & Cutting
- 29 CFR 1926, Subpart K, Electrical
- DOE O 414.1D, Quality Assurance
- 8 CCR 1920-1938, Fire Protection and Prevention
- 19 CCR 904.5-904.7, Inspection, Testing, and Maintenance Frequencies
- ANSI Z49.1, "Safety in Welding, Cutting and Allied Processes," Sections 4.3 and E4.3, current revision.
- SLAC ES&H Manual Chapter 12 (pertinent sections described herein)

11.3 SLAC Specific Requirements and Procedures

In addition to Section 11.2 of this manual, the Subcontractor fire protection and prevention program shall meet the following SLAC requirements.

11.3.1 General

- A Fire Prevention Plan shall be developed and submitted to SLAC for review and approval.
- Fire extinguishers shall be placed throughout the construction site such that a worker does not need to travel more than 75 feet to reach one. These fire extinguishers shall not be relocated by fire watches. Fire watches shall be issued separate fire extinguishers specifically for fire watch use. Fire extinguishers shall be inspected monthly and the inspection shall be noted on an attached tag. Fire extinguishers shall have been serviced within the past 12 months.
- Fire suppression system must be functional and accepted by SLAC's Building Inspection Office prior to bringing furniture into a building.
- Once the fire suppression or alarm system is operational and accepted by SLAC, impairments to the system will need to be coordinated with the FCM. Impairment shall not be initiated until the FCM confirms that the impairment is authorized.
- Free access shall be maintained at all times to all exits, fire alarm boxes, fire extinguishing equipment, and any other emergency equipment. Free access means clear of all obstructions.

S&H Data Requirements:

Fire Prevention Plan

11.3.2 Hot Work

- Hot work is any open flame or slag/spark throwing activity: pipe soldering, brazing, any type of welding, torch cutting, abrasive wheel cutting, metal grinding, etc.
- Hot work permit is always required. The FCM or FSR will obtain the permit and provide it to the subcontractor.
- The Subcontractor shall perform Hot Work in accordance with the SLAC Hot Work Permit System as outlined in section 11.3.3 of this manual.
- The Subcontractor shall ensure that all lower-tier Subcontractors understand and comply with the requirements of the permit system.
- Subcontractor personnel who perform fire watch duties shall be adequately trained and qualified. See Section 11.3.3.2 below for additional information.
- Alternatives to performing hot work (e.g., saw cutting instead of torch cutting) should be used where practical.
- Hot work should be performed in Subcontractor shops or designated areas (e.g., pre-approved weld booths or shop areas) where practical.
- The Subcontractor shall ensure that hot work is performed within the requirements of the hot work permit. Completed hot work permits shall be brought to the attention of the FCM and FSR. The document will become part of the red folder.

- Combustible materials must be removed from hot work location or covered with fire blankets. Clear area must be 35 feet away from hot work or 50 feet if the hot work is occurring at an elevated location. Reduced clearances are authorized for low hazard hot work operations (e.g. pipe soldering) by SLAC on a case by case basis.

11.3.3 Hot Work Permit System

Subcontractors conducting hot work shall perform hot work under the SLAC Hot Work Permit System. The Subcontractor will submit a hot work permit request through the FCM. Approval for the hot work permit will be by certain authorized SLAC personnel. The Subcontractor will be responsible for providing all the required materials, personnel and protective equipment to conduct all hot work within the requirements of the respective hot work permit.

Prior to the start of any hot work activity, the Subcontractor shall perform a walk-down of the work to verify hazard identification and control. The Subcontractor is ultimately responsible for sub-tier compliance with the requirements of the permit. The Hot Work Permit is valid only for the specified task noted on the permit and for a maximum of 8 days. Changes from the scope of work identified on the permit shall be brought to the subcontractor supervisor, the FCM, and the hot work approver.

11.3.3.1 Hot Work Location and Fire Prevention

The location of hot work shall be determined by utilizing the following priority list:

- Hot work should be performed in Subcontractor shops or designated areas (e.g., pre-approved weld booths or shop areas) where practical.
- Combustibles shall not be located within 35 feet of the work area, or 50 feet if the hot work is occurring at an elevated location.
- If combustibles cannot be removed from within 35 feet of the work area, fire barriers such as screens or blankets shall be used to protect combustibles.
- Protect openings in walls, floors, roofs, and ceilings where sparks can travel beyond the work area to inaccessible or unprotected areas. Openings or cracks in walls, floors, roofs or ceilings within 35 ft. of the site shall be tightly covered with fire-retardant or noncombustible material to prevent the passage of sparks to adjacent areas.
- Beware of heat conduction through penetrations. Hot work that is performed on pipes or other metal that is in contact with combustible walls, partitions, ceilings, roofs, or other combustibles, shall not be undertaken if the work is close enough to cause ignition by conduction.

11.3.3.2 Fire Watch

The Subcontractor shall establish a fire watch, as described in the hot work permit, to protect the safety of workers and assets. The fire watch observes workers conducting the welding, cutting, or grinding operations and monitors adjacent areas. The worker(s) assigned to this task of fire watch shall have fire extinguishing equipment readily/immediately available.

A. Fire watch qualifications

- Able to recognize ignition hazards and understand fire prevention principles
- Fire extinguisher training

- Be knowledgeable of emergency reporting procedures and have necessary phone or radio to perform this task.
- Assertiveness
- Attention to detail

B. Duties

- Ensure clear area 35 feet from hot work location (or 50 feet if the hot work is occurring at an elevated location) or ensure combustibles that cannot be moved are covered with a fire blanket.
- Empowered to prevent the start of hot work or interrupt it, as needed, until the requirements are met (e.g., combustibles removed or covered).
- Maintain continuous fire watch during hot work and for one half hour afterwards or longer as specified on the hot work permit.
- Other duties – Fire watches may only do side tasks that are menial, support the hot worker, and don't take them out of the immediate area
- Multiple fire watches shall be used as needed. One watch may cover multiple workers only if there is a direct view of each hot worker from one spot. If sparks or slag can be cast beyond the view or rapid accessibility of one fire watch, a separate fire watch will be required for those areas. If sparks or slag is cast to lower levels than a fire watch will be needed at each affected level. Openings in walls and floors should be considered in planning the fire watch.
- Contact 911 and SLAC x5555 (650-926-5555) in the event of an emergency.
- Prior to leaving the site, the fire watcher shall verify that the possibility of fire does not exist. All of the fire watch requirements will be described on the hot work permit.

11.3.3.3 Fire Protection Equipment for Hot Work

Fire protection equipment shall be sufficient for the hazards present. At a minimum, a 2A:20-B:C rated fire extinguisher is required for the worker performing hot work and for each fire watch. The fire extinguisher shall be readily available in the immediate work area; arms reach.

11.3.3.4 Hot Work Protective Clothing

Subcontractors shall ensure that the personnel protective clothing selected for hot work minimizes the potential for ignition, burning, trapping hot sparks and electric shock as identified in SLAC's ES&H Manual Chapter 19, "Personal Protective Equipment" and ANSI Z49.1, "Safety in Welding, Cutting and Allied Processes," sections 4.3 and E4.3, current revision.

11.3.3.5 Hot Work Required Inspections

In addition to the fire watch requirements, the Subcontractor's authorized worker/permit holder shall inspect the work area a minimum of once per day to verify compliance with permit requirements. Additionally, responsible Subcontractor personnel shall also perform periodic inspections to ensure continued compliance with the requirements of the permit. When inspections identify unsafe conditions or the scope of work departs from that defined in the permit, the hot work shall be stopped immediately and the FCM and FSR notified.

11.3.3.6 Hot Work Outdoors

The Subcontractor shall ensure that vegetation and other combustibles are removed, cut back, or otherwise protected to prevent ignition during hot work outdoors. The requirements for performing hot work outside will be captured in the hot work permit. A high level of caution shall be exercised to prevent wild land fire. If wind speeds exceed a constant velocity of 10 miles per hour, hot work is not permitted outdoors.

S&H Data Requirements:

Hot Work Permit (link not provided; managed by FCM and FSR during project)

Resources:

Fire and Life Safety: Fire Prevention Hot Work Procedures (SLAC-I-730-0A12C-001)

11.3.4 Fire Protection System Outages and Impairments

Subcontractors performing work shall plan their work and take the necessary steps to minimize impairments of fire suppression, detection, or alarm systems. When impairments of pre-existing systems are necessary to perform a particular scope of work, they shall be coordinated with the FCM and approved by the SLAC Fire Marshal or designee. Impairment shall not be initiated until FCM confirms that the impairment is authorized and that any specified compensatory measures have been implemented.

S&H Data Requirements:

Fire Protection System Impairment Authorization (link not provided; managed by FCM and FSR during project)

11.3.5 Exits and Exit Access

The Subcontractor shall ensure that a clear path of at least 36 inches width and 6 feet 8 inches tall is maintained to exits on indoor projects. Exits shall be marked by a readily visible sign. Access to exits shall be marked by readily visible signs in all cases where the exit or way to reach it is not immediately visible to workers. Review and approval by the SLAC Fire Marshal shall be obtained prior to blocking any exit path for any amount of time.

11.3.6 Flammable and Combustible Liquids Storage

Flammable and combustible liquids shall be stored in listed or approved containers and cabinets, and storage quantities shall be minimized in accordance with SLAC's requirements and NFPA Codes. Rags used to apply flammable liquids are to be disposed of in self-closing approved safety containers. The FCM will assist the Subcontractor with obtaining these containers.

11.3.7 Oxygen/acetylene Safety

Oxygen/acetylene equipment shall be in excellent condition. Hoses shall not be damaged; their attachments to regulators and cutting/welding hardware shall be secure; regulators shall be in good shape; cylinder valves are not damaged; cylinders are not damaged; cutting tip seating surface not damaged; etc. Cylinders shall be stored upright on a cart or securely attached to a structural member. Carts shall have a barrier panel between the two cylinders. Ensure clothing and equipment is free of grease and oil. Wear proper PPE including flame resistant clothing, protective gloves, sleeves, aprons and safety shoes to protect from sparks and slag, goggles or mask with tempered lenses. Ventilate work

areas adequately. Wear respiratory protection if toxic fumes are being generated by welding or cutting on certain materials.

11.3.8 Smoking/Wildfire

Smoking, if permitted by the Subcontractor, shall be restricted to Fire Marshal's Office designated areas that incorporate appropriate facilities for the safe disposal of smoking materials. Due process and control shall be employed to prevent wildfire. Open fires are not allowed.

11.3.9 Housekeeping/Trash

The Subcontractor shall police the work area frequently and maintain good housekeeping. Common garbage and other waste shall be disposed of at frequent and regular intervals. Containers shall be provided for the collection and separation of waste, trash, oily or used rags, and other refuse. Containers used for garbage and other oily, flammable, or hazardous wastes, (such as caustics, acids, harmful dusts or similar materials) shall be equipped with covers. Chemical agents or substances, which might react to create a hazardous condition, shall be stored and disposed of separately.

11.3.10 Portable Electric Heaters

The following requirements apply to portable electric heaters used on the jobsite:

- Portable electric heaters shall be equipped with a tip-over switch.
- Locate portable electric heaters in areas that minimize their fire hazards.
- Do not use portable electric heaters near flammable materials/liquids.
- Follow manufacturer's literature for clearance of listed portable electric heaters from combustible materials.
- Never place portable electric heaters on an unstable surface.
- Use only portable electric heaters approved by Underwriters Laboratories, Inc. (UL) or another nationally recognized test laboratory (NRTL).
- Portable electric heaters shall not be used with extension cords, as most extension cords are not rated for the higher power demands of space heaters and may become overloaded and catch fire (table 3).

11.3.11 Combustion-type Construction Site Heaters

Follow all instructions on operation. Use work planning and control to identify and control hazards associated with these heaters.

11.3.12 Fire Suppression & Alarm System Functionality Prior to Furniture Installation

Prior to moving furniture into a building, the fire suppression and alarm system must be installed, tested, and approved for operation by the SLAC Fire Marshal and Building Inspector.

12 HOISTING AND RIGGING

12.1 Applicability

The requirements of this section apply to all Prime Subcontractors' and sub-tier subcontractors' hoisting and rigging (H&R) activities at SLAC.

The equipment covered under this procedure includes H&R devices and associated equipment such as slings, ropes, and chains, which provide mechanical assistance in raising and lowering a load. This includes either power or manually operated equipment. It includes the use of non-crane devices (forklifts, excavators, etc.) acting as a crane.

12.2 Regulatory and SLAC Requirements

All Subcontractor H&R activities shall be conducted in accordance with the following statutory requirements:

- DOE-STD-1090-2007 Hoisting and Rigging Standard
- 29 CFR 1926, Subpart CC, Cranes and Derricks in Construction.
- 29 CFR 1926, Subpart N, Cranes and Derricks
- ASME B30.5, Mobile and Locomotive Cranes
- ASME B30.9, Slings
- ASME B30.10, Hooks
- ASME B30.20, Below-the-Hook Lifting Devices
- ASME B30.26, Rigging Hardware
- SLAC ES&H Manual Chapter 41 (pertinent sections described herein)

12.3 SLAC Specific Requirements and Procedures

In addition to Section 12.2, all Subcontractor hoisting and rigging (H&R) activities shall meet the following specific SLAC requirements as applicable.

Subcontractors bringing H&R equipment on site shall be able to demonstrate that their equipment is properly maintained, in safe operating condition, and that operators are experienced and qualified. Subcontractor crane operators are not permitted to operate SLAC H&R equipment. Exceptions to this requirement will be reviewed and accepted or rejected by the SLAC SME for H&R. All H&R equipment brought on site shall be in a new or like new condition free of hydraulic, oil, or fuel leaks.

12.3.1 Operator Training and Certification

Subcontractors who provide and operate H&R equipment shall provide:

- **Proof of Training/Certification:** SLAC requires proof of training, such as an NCCCO license or other licenses/certification that meet the requirements in section 10.2. This certification/license shall be current for the crane type they will be operating. (i.e., Mobile Crane Operator, Tower Crane Operator).
- **Non-crane devices:** proof of operator training is required for a forklift, excavator, etc. used as a crane. The operator will also be trained as a Rigger, described in 12.3.2.

Medical Requirements: Crane operators shall meet ASME B30 physical requirements throughout their certification periods. The following meet the requirement:

- NCCCO Physical Examination Form; valid for 3 years.
- A current Department of Transportation (DOT) Medical Examiner's Certificate—valid for two years

12.3.2 Rigger and Signal Person

A qualified professional rigger must be in continual possession of a valid certificate of competency by an accredited certifying entity for the type of rigging equipment and crane to be used. Certificate renewal is in accordance with the certifying entity's renewal schedule.

A qualified signal person must in continual possession of a valid certificate of competency by an accredited certifying entity for the type of rigging equipment and crane to be used. Certificate renewal is in accordance with the certifying entity's renewal schedule.

Copies of these certificates will be provided to the designated hoisting and rigging plan approver and included with the hoisting and rigging plan.

12.3.3 Hoisting and Rigging Operating Requirements

12.3.3.1 Planning and Approval

The Subcontractor shall evaluate and plan H&R operations in advance. A competent person shall identify the hazards and determine the controls necessary to maintain an acceptable level of risk. A documented plan is required for all lifts. The Subcontractor shall utilize the SLAC Lift Planning and Control form or other SLAC-accepted equivalent plan form. The lift plan will be developed with the assistance of the FCM and FSR. Ordinary lift plans shall be approved by the Superintendent, Subcontractor Safety Representative (if any), FCM, and FSR. Critical and complex lifts shall also be approved by the SLAC PM and the SLAC Hoisting and Rigging Program Manager.

Critical lifts are defined as lifts for which any of the following conditions exist:

- The weight of the lift exceeds 90 percent of the crane's rated capacity in the configuration that will be used during the lift. Exception: During steel erection, a critical lift is defined as a lift that exceeds 75 percent of the crane's rated capacity or requires the use of more than one crane.
- Lifts involving non-routine or difficult rigging arrangements or where loads will require exceptional care in handling because of size, weight, close-tolerance installation or high susceptibility to damage.
- Hoisting of personnel with a crane or derrick.
- If the item being lifted were to be damaged or upset, it could result in a release of hazardous material into the environment or the release of airborne concentrations that could exceed established occupational exposure limits.
- The item being lifted is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility, or project operation.
- The cost to replace or repair the item being lifted, or the delay in operations of having the item damaged, would have a negative impact on the facility, organization, or construction project to the extent that it would affect project commitments.

- The item, although non-critical, is to be lifted above or in close proximity to a critical item or component.

Complex Lifts are defined as lifts that present logistical difficulties or lift coordination complications, thus requiring a higher level of planning and execution. Complex lifts may involve the following:

- A lift involving multiple cranes.
- Axial rotation of an object in the vertical plane or other complex movement of the load.
- A lift where the behavior of the load while in suspension is questionable; not under the trolley, tip, etc.

S&H Data Requirements:

[Lift Planning and Control Form](#)

12.3.3.2 Pre-Lift Meeting

Prior to performing any lift, the Subcontractor shall conduct a pre-lift meeting with workers involved in the work activity. The following items shall be reviewed:

- The scope and sequence of work
- Roles and responsibilities
- Hazards and controls
- Other relevant information identified in the Hoisting and Rigging Lift Plan.

When performing lifts designated as critical and/or complex lifts, this meeting shall be documented utilizing the SLAC Daily Construction Work Review and General Contractor Release Form. In addition to the signatures listed the SLAC Designated person will be the final signature for acceptance.

12.3.3.3 Communication

The Subcontractor shall require the use of ANSI B30.5 standard hand signals or voice/radio communications during the course of crane operations.

12.3.3.4 Access Control

The Subcontractor shall cordon off or manually control the lift area to prevent access by unauthorized workers by deploying barricades and warning signs and/or utilizing personnel to monitor and control access to the area. The Subcontractor shall cordon off the swing radius area for mobile crane bodies with red danger tape and stanchions or other equivalent barricade apparatus.

12.3.3.5 Protection of People

Do not place people in jeopardy by moving a suspended load over people, an occupied section of a facility, or potentially occupied section of a facility. Work beneath a suspended load is prohibited unless the load is supported by cribbing, jacks, or a solid footing that safely supports the entire weight. All personnel shall remain clear of moving and shifting loads.

12.3.3.6 Rated Load Capacity

The rated load capacity of monorails and other H&R structural elements, such as jibs, shall match, at a minimum, the rated load capacity of a hoist placed upon it.

Know the weight of the object being lifted or use a dynamometer or load cell to determine the weight. If the weight of the load is unknown, a minimum 50% safety factor shall be employed. This means that the crane or hoist, slings, and rigging hardware shall have twice the capacity of the estimated load.

Fully extend outriggers or reduce the cranes rated load capacity as directed and allowed by the crane manufacturers operating manual. An underground utility survey is required before setting up a mobile or other ground bearing crane. If a previous utility survey's marks are readily visible, the current working drawings are reviewed, and the as-built drawings have been reviewed, another utility survey is not required.

12.3.3.7 Electrical Distribution Lines

Watch for overhead electrical distribution and transmission lines and maintain a safe working clearance of at least 10 feet or as required from energized electrical lines. Any overhead wire shall be considered to be an energized line unless it has been locked out and zero-voltage verified. Exercise caution when working near overhead lines having long spans as they tend to move laterally or vertically due to the wind, which could cause them to breach the safety zone.

12.3.3.8 Environmental Factors

Environmental factors, such as weather and terrain can adversely affect a lift. When performing outdoor lifts, the following environmental factors shall be considered.

High Winds

Lifts shall be suspended if prevailing wind conditions may adversely affect the lift. As a general rule, this applies to wind speeds of 25 miles per hour or more. However, based on the nature of the load – such as size, surface area, or fragility – a lower wind speed limit may warrant suspension of a lift. The hoisting and rigging plan approver will review with the operator the behavior of the load in prevailing winds and the stresses placed upon H&R equipment to the extent necessary to safely complete the lift.

Freezing Surfaces

Check surface conditions to determine if the load may be frozen to the ground. Do not use H&R equipment to “break loose” a load that is frozen to the ground. This subjects H&R equipment to severe and unintended loads.

Ground Conditions

Check ground conditions around the hoisting equipment for proper support, including settling under and around outriggers, ground water accumulation or other similar conditions. Refer to Section 12.3.3.6 for underground utility requirements.

12.3.4 Crane Inspection, Maintenance & Testing

12.3.4.1 Crane Inspection

Prior to being placed into service, all Subcontractors owned and/or rented cranes shall meet the requirements in 8 CCR 5031, “Inspection”. These inspections will be documented and made available to

SLAC. They will be attached to the lift plan which the crane will be used for. These inspections include periodic (four times per year), annual, and quadrennial. In some circumstances, monthly inspections are also required (see 12.3.4.4).

All crane inspection deficiencies shall be identified, documented, and mitigated prior to the crane's arrival at SLAC. If a deficiency is identified at SLAC, the crane will be taken out of service until the deficiency is rectified. The Subcontractor shall maintain the original copy of the inspection report and place it with the lift plan which the crane was used for.

12.3.4.2 Daily Pre-Operational Inspections

All cranes will be inspected prior to the first use for that shift. Records are required.

Below is a partial list of inspection items. This list is not all encompassing and the Subcontractor is responsible for thoroughness of the inspection based on manufacturers and SLAC requirements.

- Functional operating mechanisms for maladjustment interfering with proper operation
- Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air systems
- Hooks for cracks, deformation, latch engagement, and damage from chemicals
- Hoist rope for significant wear, kinking, crushing, bird-caging, corrosion, or broken strands or wires
- Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations
- Primary hoist upper-limit device for proper operation.

12.3.4.3 Deficiencies

Crane operators, hoisting and rigging inspectors, riggers, and other designated qualified workers shall examine deficiencies and determine whether the equipment should be removed from service or if a more detailed inspection is required.

12.3.4.4 Monthly Inspections

Cranes active on the site for periods extending beyond 1 month shall receive monthly documented inspections. The manufacturer's recommendations will be followed. The competent person shall at a minimum visually inspect the following items for damage, wear, or other deficiency that might reduce capacity or adversely affect the safety of the crane:

- Critical items such as brakes and crane hooks
- Hoist ropes
- Safety mechanisms, indicators, and other related systems

Signed and dated inspection records shall be kept on file and shall be readily available. Before the crane is returned to service, correct deficiencies that could reduce its capacity or adversely affect its safety.

12.3.4.5 Annual Inspections

Annual crane inspections shall conform to the requirements 8 CCR 5031, "Inspection" and as recommended by the manufacturer. Documentation of these inspections shall be available for review by SLAC.

12.3.4.6 Idle Equipment

H&R equipment that is idle for a period of greater than one month (fully operational but not used) does not require monthly inspections. Idle H&R equipment shall be removed from service and tagged with an administrative "CAUTION – Do Not Operate" label to alert potential users of the start-up inspection requirements to include the requirements contained in the daily and monthly inspections. Documentation of these inspections shall be available for review by SLAC.

12.3.4.7 Maintenance

A preventive maintenance program shall be established and based on the recommendation of the crane manufacturer. If equipment maintenance procedures deviate from published manufacturer's recommendations, the alternate procedures shall be approved in advance by the manufacturer or another qualified person and be kept readily available. Dated maintenance records should be kept readily available to appointed personnel. Replacement parts shall be at least equal to the original manufacturer's specifications.

12.3.4.8 Rated Load Test

Prior to initial use, all cranes in which load sustaining parts have been modified, replaced, or repaired shall be load-tested by a qualified inspector or under the direction of that inspector. All rated load tests shall be performed in accordance with manufacturer's recommendations.

S&H Data Requirements:

Crane Inspections: daily/pre-use; monthly, periodic (4x/year), annual, and quadrennial.

Maintenance records

Rated load tests

12.3.5 Rigging Safety Requirements

12.3.5.1 Rigging Component Procurement

Rigging components shall be obtained from reliable sources and shall be rated for H&R applications. Do not use damaged or suspect rigging. All hoisting and rigging hardware shall meet SLAC requirements, ASME B30.20; "Below-the-Hook lifting devices, and ASME B30.26; "Rigging Hardware". H&R equipment that doesn't meet these requirements shall not be brought onsite. Chinese shackles are not permitted to be used. See section 12.4.2 for additional information on suspect and counterfeit rigging and hoisting requirements.

12.3.5.2 Storage and Maintenance

Rigging equipment shall be stored and maintained in accordance with the manufacturer's recommendations. Protect rigging hardware from weathering and harsh environments. Rust, corrosion, and/or UV damage can degrade rigging performance.

12.3.5.3 Labeling

Rigging hardware shall be labeled for identification purposes with a durable tag.

12.3.5.4 Rigging Safe Work Practices

The Subcontractor shall ensure that the following safe work practices are utilized when rigging a load:

- Determine the weight of the load. Do not guess. The weight of the load shall be within the rated load capacity of the rigging.
- Determine the proper size for slings and components. Refer to the manufacturer's literature and the DOE Hoisting and Rigging Standard for details.
- Select slings so that the rated load capacity is adequate when the appropriate de-ratings are applied based on sling angle and/or hitch angle considerations (choker angle de-rating, in all directions of pull).
- Verify that shouldered eyebolts are installed in accordance with the manufacturer's recommendations. Beware of side pull applications. Eyebolts shall be de-rated, per the manufacturer's requirements, when subject to side loads.
- Do not use shoulder less eyebolts for lifting purposes.
- Eye nuts are used in vertical pull only unless otherwise specified by the manufacturer.
- Use safety hoist rings (swivel eyes) as a preferred substitute for eyebolts when possible.
- Pad sharp and small diameter edges to protect slings. Machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under load. Dense foam, tire rubber, or other dense, pliable materials may be suitable for padding.
- Do not use slings, eyebolts, shackles, hooks, or other hardware that appear to have been cut, welded, brazed, or is otherwise suspect.
- Determine the center of gravity and balance the load before moving it. Keep the attachment points of rigging accessories as far above the center of gravity as possible.
- Lift the load initially just a few inches to test the rigging and balance.
- Place blocks beneath loads prior to setting down the load to allow removal of the sling, where applicable.

12.3.6 Inspection Criteria for Slings, Below-the-Hook Lifting Devices and Rigging Hardware

12.3.6.1 Prior to Use Inspection

At the beginning of each shift or prior to use, if it has not been in regular service, the competent person shall visually inspect the rigging equipment (slings, below the hook devices and rigging hardware) in accordance with the appropriate ASME/ANSI standard or according to the manufacturer's instruction, whichever is more stringent. Defective rigging equipment shall be removed from service and destroyed to prevent reuse.

12.3.6.2 Periodic Inspections

Rigging equipment shall be inspected periodically in accordance with SLAC, DOE, and ASME/ANSI standard or according to the manufacturer's instruction, whichever is more stringent; no less than

annually. This inspection shall be performed by a qualified inspector and have a documented inspection history, with records readily available.

12.3.7 Personnel Hoisting

12.3.7.1 Personnel Platform Lift Plan

The use of H&R equipment to hoist workers onto a platform is generally prohibited, except when the use of a conventional means of reaching the work area, such as a ladder, scaffold, or man lift, would be more hazardous or is not possible because of structural design or worksite conditions. Personnel lifts shall be properly planned and executed. This type of lift meets the requirements of a critical lift and the lift will be performed within those constraints. A SLAC Lift Plan or approved equivalent will document the planning and execution of a Personnel Lift. The Lift Plan will document why the other means are not usable.

12.3.7.2 Pre-Lift Meeting

A pre-lift meeting shall be conducted prior to initiating a personnel lift. Workers involved in the work activity shall attend the pre-lift meeting, including the FCM, FSR, lift plan approver, Subcontractors, man basket occupants, and the crane operator.

12.4 SLAC Special Emphasis

12.4.1 Department of Energy Hoisting and Rigging Standard

SLAC follows the Department of Energy (DOE) Hoisting and Rigging Standard. The Hoisting and Rigging Standard is a DOE-wide consensus standard for rigging, crane, and hoist operations. It references applicable industry standards and regulations governing this type of work. The Hoisting and Rigging Standard contains detailed information on H&R inspection, testing, maintenance, and operational requirements. SLAC uses the 2007 version of the Hoisting and Rigging Standard.

12.4.2 Suspect and Counterfeit(S/CI) Rigging and Hoisting Components

Per SLAC requirements all shackles must meet or exceed the requirements of ASME B30.26. Each shackle body must be permanently and legibly marked in raised or stamped letters on the side of the bow and must be used to show:

- Manufacturer's name or trademark
- Size
- Safe working load or working load limit.

Shackle pins must be permanently and legibly marked in raised or stamped letters.

- Manufacturer's name or trademark
- Material type, or load rating

The ASME B30.26 standard for hooks requires that the manufacturer's identification be forged, cast, or die-stamped on a low-stress or non-wearing area of the hook.

13 FALL PROTECTION

13.1 Applicability

The requirements of this section apply to all Prime Subcontractors' and sub-tier subcontractors' activities which require personnel to work or potentially be exposed to unprotected heights of six feet or more at SLAC. This includes working at unprotected heights of six feet or more caused by excavation and trenching activities.

13.2 Regulatory and SLAC Requirements

The Subcontractor fall protection program shall be conducted in accordance with the following statutory and SLAC requirements:

- SLAC ES&H Manual Chapter 45, "Fall Protection" (pertinent sections described herein)
- 8 CCR 1669-1671.2, "Fall Protection"
- 8 CCR 3209, "Standard Guardrails"
- 8 CCR 3210, "Guardrails at Elevated Locations"
- 8 CCR 3212, "Floor Openings, Floor Holes and Roofs"
- 8 CCR 3270–3280, "Access, Work Space, and Work Areas"
- ANSI/ASSE A10.32-2012, "Personal Fall Protection Used in Construction and Demolition Operations"
- ANSI Z359-2007 Fall Protection Code.
- ANSI/ASSE Z359.0-2012, "Definitions and Nomenclature Used for Fall Protection and Fall Arrest"
- ANSI/ASSE Z359.1-2007, "Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components"
- ANSI/ASSE Z359.6-2009, "Specifications and Design Requirements for Active Fall Protection Systems"
- ANSI/ASSE Z359.12-2009, "Connecting Components for Personal Fall Arrest Systems"
- ANSI/ASSE Z359.13-2009, "Personal Energy Absorbers and Energy Absorbing Lanyards"

Note: The height allowances permitted for fall protection on Steel Erection and other trade related exceptions to Cal/OSHA regulations do not apply at SLAC.

Additionally, all workers who are constructing a leading or unprotected edge, 6 feet or more above lower levels, shall be protected from falling by guardrail systems, safety net systems, or personal fall restraint or arrest systems. No exceptions allowed.

13.3 SLAC Specific Requirements and Procedures

SLAC requires 100 percent fall protection above six feet. In addition to Section 13.2, all work activities and/or potential personnel exposures to unprotected heights of six feet or more shall meet the following SLAC requirements as applicable in sections 13.3.1 – 13.3.4 of this manual.

13.3.1 Fall Protection Program

Subcontractors, **performing activities at heights of 6 feet or more**, shall have Fall Protection Program that meets the requirements of this section. The program shall identify the following key personnel as identified in ANSI/ASSE Z359 Fall Protection Code who maintain the requisite knowledge and responsibility for the successful implementation of the program at the project:

- Program Administrator
- Qualified Person
- Competent Person

Additionally, the Subcontractor shall ensure personnel that are required to utilize fall protection meet the qualification of an “Authorized Person” as defined by ANSI Z359.2.

Note: Employees trained by a competent person in accordance with the requirements identified in the ANSI/ASSE Z359 Fall Protection Code will be considered as meeting the necessary fall protection training for an “Authorized Worker.”

13.3.1.1 Elevated Surface Work Plan (ESWP)

An ESWP shall be used to document any activity requiring work to be performed above 6 feet above a lower level that does not have guardrails or their equivalent. Use of scaffolding, ladders, and mobile elevated work platforms are exempt from this requirement. SLAC’s ESWP form or approved alternative will be used. (Note: Use of ladders within six feet of a leading edge does require an ESWP.)

The ESWP will address the hazards, mitigations, and conditions under which a worker(s) will access and perform work on, an elevated surface. The ESWP will be filled out completely including height and payout calculations. Also, equipment cut-sheets must be provided for the actual equipment that will be used (e.g., self-retracting lanyard, anchor, etc.). The mitigations to the hazards will follow the fall protection hierarchy, outlined below. If Fall Arrest is chosen as the method of protecting workers from working on an unprotected elevated work surface, a description of why guard rails and fall restraint cannot be used will be included on the ESWP. The name/date/signature of the Subcontractor’s author and competent person will be recorded on the ESWP prior to its review and acceptance by a designated SLAC Competent or Qualified Person. The ESWP is in addition to the JSA for the work being performed and becomes part of the Red Folder for the work/project.

ESWPs shall be submitted to SLAC for review at least ten working days prior to when needed.

The Subcontractor shall incorporate the following **hierarchy of control** when selecting methods to eliminate or mitigate fall hazards:

- **Hazard Elimination.** First consider eliminating fall hazards. This might involve moving the work surface to ground level or changing a task so that workers do not approach the fall hazard.
- **Alternative means.** Using boom or scissor lifts (mobile elevated work platforms) or scaffolding to remove workers from a fall hazard.
- **Passive Fall Protection.** Take actions that isolate or effectively separate the hazard from workers, such as installing floor coverings or handrail/guardrail systems.
- **Fall Restraint.** Establish a travel restraint system that prevents a worker from accessing a position from which he or she could fall.

- **Fall Arrest.** Configure a Personal Fall Arrest System (PFAS) designed to arrest a fall after it has begun.
- **Administrative Fall Protection System.** (Fall Protection Plan) Establish controlled-access zones and safety-monitoring systems. All other means of protecting workers shall be exhausted before a Fall Protection Plan can be considered for use at SLAC. The Fall Protection Plan must be written by a qualified person and approved by SLAC's Chief Safety Officer.

S&H Data Requirements:

[Elevated Surface Work Plan](#)

13.3.2 Fall Protection Equipment System Requirements

Fall protection equipment and systems shall be used in accordance with the manufacturer's recommendations and the requirements of this procedure. Misapplication or use of this equipment in a way contrary to those requirements is prohibited. The subcontractor's competent person shall supervise the work and verify that the fall protection system is properly established and maintained. A Qualified Person will be required for fall protection equipment use, where leading edge work is required. Special attention must be afforded to: (a) swing radius if fall might start at an angle to the anchor point; (b) use of self-retracting lanyards tied off horizontally (equipment must be rated for horizontal use and all necessary accessories provided); (c) anchor locations that are not above the dorsal D-ring location between shoulder blades.

S&H Data Requirements:

Cut sheets of equipment shall be submitted to SLAC for review and approval prior to use.

13.3.2.1 Personal Fall Arrest System Strength Requirements

Subcontractors shall ensure that the strength and testing requirements for personal fall arrest systems, components and subsystems shall comply with the provisions of ANSI Z359.1, Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components. All other applicable fall protection equipment and system requirements shall at a minimum meet the requirements of ANSI A10.32 Standard for Personal Fall Protection used in Construction and Demolition Operations.

13.3.2.2 Personal Fall Arrest System (PFAS) Inspections & Storage

Routine Inspection PFAS equipment shall be inspected by the authorized worker using the equipment prior to each use. Equipment inspections shall follow the guidelines established by the manufacturer. Damaged or questionable equipment shall be immediately removed from service and tagged accordingly. Equipment that cannot be repaired shall be destroyed.

Post-Fall Inspection PFAS components subject to a fall shall be immediately removed from service and destroyed or returned to the manufacturer for inspection, repair, and re-certification. Contact the manufacturer to determine the available options.

Periodic Inspection A competent person, other than the user, shall periodically inspect PFAS equipment. This inspection shall follow the intervals and guidelines established by the manufacturer but shall not be greater than six months. The results of these inspections shall be recorded and available for review by SLAC.

Equipment Storage Fall protection equipment shall be stored in a manner that protects it from exposure to adverse conditions, such as ultraviolet light or harsh weather, that could result in damage or diminished performance and/or other specific requirements established by the manufacturer.

13.3.2.3 Safety Net Systems

The use of safety net systems as the means of fall protection is not anticipated at SLAC unless used in conjunction with other accepted means of fall protection and compliance with other regulatory requirements. Contact the SLAC FSR for additional information on safety net systems.

13.3.3 Portable Ladders

General Requirements:

- Portable ladders shall be set up and used in accordance with Cal/OSHA 8 CCR 3276, “Portable Ladders” and manufacturer requirements and be a minimum Type I, Heavy Duty Classification. The ladder shall be manufactured to the ANSI ASC A14 series standards. Light and medium duty class ladders are prohibited.
- Type 1A and 1AA (Extra Heavy Duty and Special Duty) portable ladders are strongly recommended
- Extension or straight ladders shall be tied/secured off to prevent displacement.
- Ladder users shall maintain three-point control (three limbs maintain contact on the ladder) while ascending and descending the ladder,
- Job made ladders when constructed and used must be built in accordance with the American National Standards Institute (ANSI) A14.1 - American National Standard for Ladders-Portable Wood-Safety Requirements. Job made ladders shall receive daily visual prior to use and weekly documented inspections.

Fall Protection:

Fall protection is not required when using portable ladders in accordance with the following requirements.

- The work can be performed without the employee having to reach (i.e. the Employee’s hips remain within the plane of the vertical side rails)
- Ladder users are not subject to a fall to a level lower than the base of ladder they are working from. If ladders are used in this condition, then the fall protection requirements of this section shall apply.
- The ladder work activity has been evaluated by a competent person who has made the determination that the work activity meets all of the requirements of this section.

13.3.4 Scaffold Use

Refer to the following SLAC procedure: [Scaffold Use Procedure](#)

13.3.5 Fall Protection on Roofs

Work on low-slope roofs shall be managed in like manner to horizontal surfaces. Roofs with more pitch are considered a fall hazard immediately when accessed, no matter how far the work location is from the leading edge.

13.3.6 Subcontractor Training Requirements

Subcontractors that are trained in accordance with the requirements identified in ASSE Z359 will be considered as meeting the necessary fall protection training requirements for working at SLAC. The Subcontractor shall provide proof of such training. This documentation will become part of the SSSP for that work. The Subcontractor is required to provide authorized and competent persons (as defined in ASSE Z359.0) at the job site.

13.4 SLAC Special Emphasis

13.4.1 Fall Protection Plan

A Fall Protection Plan (FPP) is required for performing work on an unprotected elevated work area where conventional fall protection methods, scaffolding, or other means are impractical. All other fall protection means shall be exhausted before a FPP is considered. A FPP must

- Demonstrate why conventional fall protection cannot or should not be used
- Be prepared and changed only by a qualified person and developed specifically for the site where the work is being performed
- Name the qualified person who developed the plan
- Be approved in writing by the SLAC Chief Safety Officer. Be kept up to date as the project progresses or conditions change
- Be kept at the job site
- Be implemented under the supervision of a competent person in fall protection, who must be identified in the plan
- Include written discussion of other measures that will be taken to reduce or eliminate the fall hazard for workers who cannot be provided with protection provided by conventional fall protection systems
- Identify locations where conventional fall protection methods cannot be used and designate these locations as controlled access zones (CAZs), cordon them off using a control line (see Figure 1), and identify each worker allowed to work in the CAZ. Other workers may work within the control line, in the designated area, under an elevated surface work plan.
- Implement a safety monitoring system when workers are in the CAZ

See **Figure 1** for Controlled Access Zone Requirements

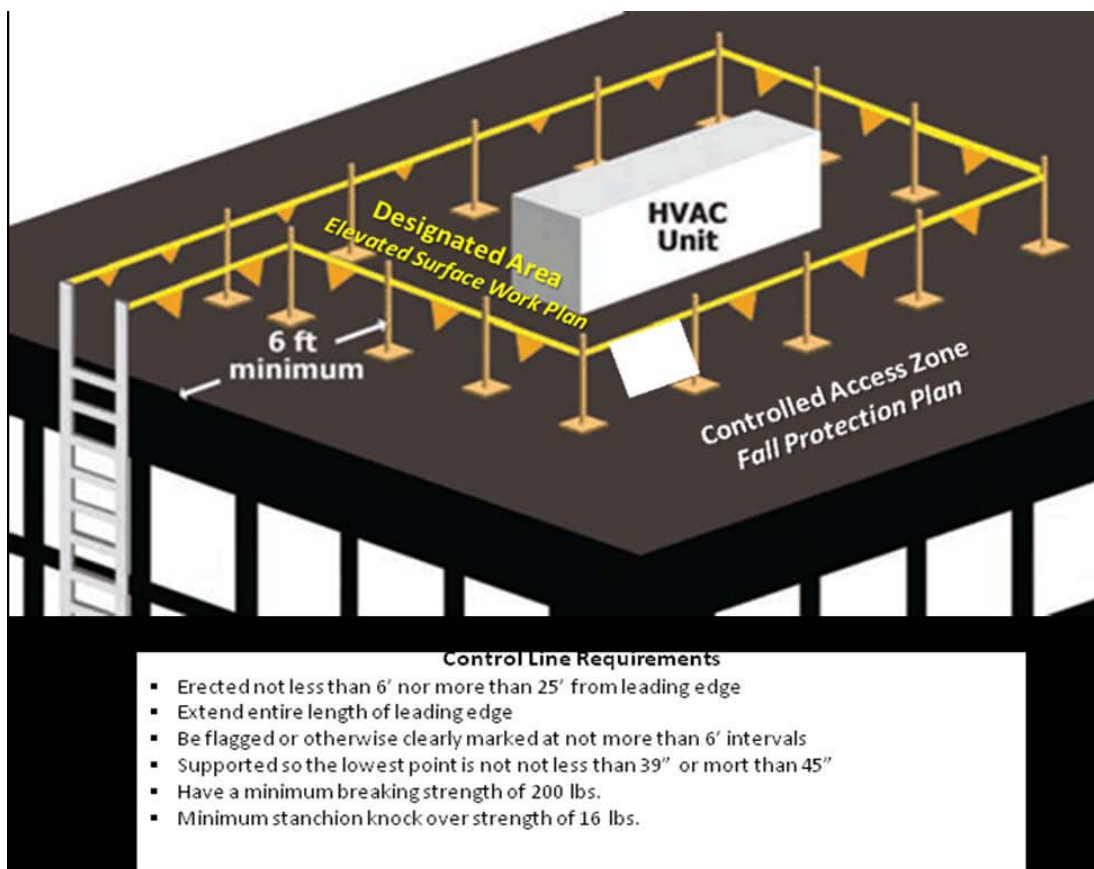


Figure 1. Control Line Requirements

14 INDUSTRIAL HYGIENE

14.1 Applicability

The requirements of this section apply to all Prime Subcontractors' and sub-tier subcontractors' activities regarding industrial hygiene matters as they relate to the construction activities at SLAC.

This section defines the requirements and responsibilities for anticipating, recognizing, evaluating, and controlling employee exposures to chemical, physical, and biological agents encountered during construction activities. The Subcontractor Industrial Hygiene (IH) program shall address the following elements (as applicable to the project):

- Noise
- Hazardous materials
- Subcontractor work site dust control
- Sanitation
- Personal exposure monitoring
- Respiratory protection
- Temperature extremes
- Lighting and illumination
- Local Exhaust Ventilation
- Lead
- Hexavalent chrome
- Asbestos
- Lasers
- Safety showers and eyewash apparatus
- Ionizing radiation
- Blood-borne pathogens
- Other significant project-related hazards

The Subcontractor shall provide personnel adequately trained/qualified to manage and implement their industrial hygiene program to a level required for the scope of work.

14.2 Regulatory and SLAC Requirements

The Subcontractor industrial hygiene program shall be conducted in accordance with the following statutory requirements:

- 10 CFR 851, Worker Safety & Health Program
- 29 CFR 1926, Construction
- 29 CFR 1910, General Industry
- American Conference of Governmental Industrial Hygienist, "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Indices", 2005 as incorporated by 10 CFR 851.
- American Conference of Governmental Industrial Hygienists manual, "Industrial Ventilation", current edition.
- SLAC Worker Safety and Health Program

14.3 SLAC Specific Requirements and Procedures

In addition to the requirements in Section 14.2, the Subcontractor industrial hygiene program shall meet the following SLAC requirements.

14.3.1 General Requirements

14.3.1.1 Identification of Health Hazards

The Subcontractor shall identify and document, as part of the SSSP, existing and potential physical, chemical, and biological health hazards. The SSSP should include any additional hazards revealed by supplemental site information provided by SLAC (e.g., site characterization data, as-built drawings, information regarding adjacent operations, etc.) and should be kept updated to reflect changes in exposure potential, new information, monitoring data, etc.

14.3.1.2 Control Measures

The Subcontractor's industrial hygiene program shall require that controls are implemented to eliminate or reduce employee exposures to below-recognized occupational exposure limits (PEL's & TLV's). Subcontractors should strive to maintain exposures to As Low As Reasonably Achievable (ALARA). Control measures to eliminate or reduce industrial hygiene-related exposures shall be identified during the pre-job planning process, captured in the SSSP and delineated in the Job Safety Analysis (JSA).

The implementation of control measures shall follow the following hierarchy:

1. Substitute to a less hazardous material if possible;
2. Use engineering controls;
3. Use administrative controls;
4. Use PPE

In the absence of monitoring data, Subcontractors shall always take a conservative approach.

14.3.1.3 Exposure Assessment

The Subcontractor shall perform monitoring as necessary to document employee exposures to chemical and physical hygiene hazards when required by regulation (e.g., asbestos, lead). However, negative exposure assessments are encouraged even when not specifically required by a substance-specific standard. Subcontractors shall be prepared to justify the adequacy of their selected controls.

Exposure assessments may be performed using various methodologies (integrated sampling, direct-reading instrumentation, modeling, etc.), as appropriate for the material(s) of concern, the site conditions and the type of data needed.

Workers shall be informed of monitoring results as soon as the results have been returned to Subcontractor, within the OSHA-specified timeframe. Co-located workers (who have similar exposure potential as those who were monitored) shall also be informed of the results, after removing any personal/confidential information.

The Subcontractor shall notify the FCM and FSR of the results of monitoring as soon as they are obtained, and provide SLAC with copies of the results, field notes and other associated documentation.

SLAC reserves the right to perform monitoring of any subcontractor construction activity.

14.3.2 Noise (Hearing Conservation)

Subcontractor Hearing Conservation Program shall meet or exceed requirements the following:

- 29 CFR 1910.95 Occupational Noise Exposure
- 29 CFR 1926.52, “Occupational Noise Exposure”
- American Conference of Governmental Industrial Hygienists (ACGIH), “Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs)”, (ACGIH TLVs and BEIs – 2005). Note: The more stringent ACGIH criteria shall me bet.

The Subcontractor shall use a hierarchy of control measures to reduce noise levels as low as feasible:

- (1) Elimination or substitution of the hazards
- (2) Engineering controls
- (3) Work practices and administrative controls that limit worker exposures
- (4) Personal protective equipment (PPE).

Every feasible effort shall be made to “engineer out” noise exposures greater than or equal to an 8-hr time-weighted-average (TWA) sound level of 85 decibels (dBA) or impact/impulse noise exceeding 140 dBA peak sound pressure, prior to using personal hearing protection as a noise attenuation device. For TWA exposures greater than or equal to 85 dBA, 3 dB doubling is required at SLAC. For example, an 88 dBA exposure cannot be exceeded for more than 4 hours. When controls are not feasible or fail to reduce noise to acceptable levels, hearing protection shall be required. Furthermore, at SLAC, regardless of exposure duration, if noise levels will be continuously above 85 dBA in an area, hearing protection shall be mandated in that area. Additionally, if work is to be performed in an environment that is suspected to exceed the allowable noise exposures, but no measurements have been taken to identify levels, mandatory hearing protection requirements shall be implemented.

The Subcontractor shall survey and evaluate suspected high noise areas and work efforts. Periodic noise measurements shall be taken to confirm hazards are understood and controls are adequate. Employees may observe surveys and evaluations, and the results shall be made available to employees.

Workers routinely exposed to high noise should be included in the subcontractor’s medical monitoring program. Refer to Occupational Medicine, Section 4.14, of this Manual for more detail.

Worker use of hearing protection shall be reinforced daily.

High noise areas shall be posted with appropriate warning signs at all entrances.

Workers shall not use audio ear buds while on the construction site.

Per OSHA and ACGIH guidance there are circumstances where ear muffs or earplugs alone are not adequate to achieve required noise reduction and both must be worn to achieve the acceptable level of noise reduction. SLAC requires such double protection for high noise operations such as jackhammering and saw cutting.

14.3.3 Control of Hazardous Materials

A hazardous material is any substance that presents a physical or health hazard to humans. Hazardous material exposures should be maintained at the lowest exposure levels practical. A chemical shall not be

used in any situation unless an individual has information indicating how the material can be used safely. Control measures to prevent overexposure to chemicals shall be incorporated into the JSA as necessary.

14.3.4 Carcinogen Control

The Subcontractor shall make every attempt to substitute less hazardous substances for any carcinogenic material (as defined by OSHA in 29 CFR 1910.1200). If hazardous materials containing carcinogenic components are used, the Subcontractor shall ensure that exposures are eliminated or effectively maintained As Low as Reasonably Achievable (ALARA).

Where the Subcontractor's use of carcinogens may impact SLAC workers, SLAC may impose additional, specific controls upon the Subcontractor.

14.3.5 Subcontractor Worksite Dust Control

All Subcontractor projects shall address dust control during pre-job planning. Outdoor areas to be cleared for construction shall be limited to keep dust generation to a minimum. Earthwork activities shall be suspended when winds exceed 25 mph. Fugitive dust emissions resulting from grading and/or wind shall be controlled. During construction, frequent watering shall be provided to roadways and disturbed areas that are not otherwise treated. The Subcontractor may need to perform worker exposure monitoring at much lower levels to demonstrate negative exposures to silica.

During facility renovation activities barriers are to be installed as needed to prevent dust migration from construction areas to other occupied space. Sufficient equipment shall be kept at the jobsite to control dust whenever a nuisance or hazard occurs. Indoors, dry sweeping is discouraged.

Refer to Specification SECTION 015000, TEMPORARY FACILITIES AND CONTROLS, for more information.

14.3.6 Sanitation

Housekeeping shall be maintained on a daily basis. All work areas, shops and offices shall be kept clean to the extent the nature of the work allows. Walking/working surfaces shall be maintained, so far as practicable, in a dry condition. Waste receptacles that do not leak and may be thoroughly cleaned and maintained in a sanitary condition shall be used. All sweepings, wastes, refuse, and garbage shall be removed in a timely and sanitary manner. Cleaning and sweeping shall be done in a manner, which minimizes the contamination of the air with dust or particulate matter. Building entrances and openings shall be maintained to minimize the entry of vermin.

When provided, water facilities and containers shall be maintained, cleaned, and sanitized in accordance with applicable regulations. Use of common utensils (e.g., sharing the same cup) is prohibited. Adequate and fully-equipped toilets and wash stations shall be readily accessible to workers and maintained in a sanitary manner at all times. Separate toilets shall be provided for men and women in accordance with California Title 8, Section 1526 Toilets at Construction Jobsites.

14.3.7 Temperature Extremes

Provisions to prevent heat stress and cold stress shall be incorporated into the project JSA(s) when work conditions may reasonably be expected to present such hazards. The Thermal Stress section of the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV's) shall be the governing guidelines.

14.3.8 Heat Stress

The Subcontractor shall provide for appropriate mitigating measures prior to heat stress becoming an issue. The American Conference of Industrial Hygienists (ACGIH) threshold limit value (TLV) guidelines shall be followed for developing and implementing heat stress mitigation strategies. The use of heat stress controls shall be addressed during the planning stages for all work that is to be performed in elevated temperature environments, and whenever impermeable clothing or multiple layers of clothing shall be worn to conduct work.

14.3.9 Cold Stress

The ACGIH Cold Stress Threshold Limit Value (TLV) is the prescribed standard for cold exposure. When work involves continuous employee exposure to an equivalent chill temperature (ECT) below 10° F, the following safe work practices shall be observed:

Workers are instructed on symptoms of frostbite and hypothermia, and appropriate preventive and first aid measures.

Warming areas are conveniently available and workers shall be allowed to access the warming areas at will.

Work is conducted using the “buddy system” or under continued supervision.

Non-emergency work is curtailed when the ECT in the work area is below -25° F. Workers who experience physical illness or injury from cold exposure are to be immediately moved to a warm area, and then examined by a physician.

14.3.10 Lighting and Illumination

The minimum lighting level for construction areas both indoors and outdoors shall be an average of 5 foot-candles measured 30 in. above the floor. Illumination for general construction plant and shop areas shall maintain an average lighting level of 10 foot-candles. Auxiliary lighting shall be used when needed for task specific activities. Care shall be exercised with the use of halogen lamps so that fire hazards are not created.

14.3.11 Local Exhaust Ventilation

Local exhaust ventilation is a primary engineering control and is required to reduce concentrations of hazardous, irritating, and odiferous air contaminants below allowable exposure limits (where feasible). The operability of such systems shall be evaluated prior to the start of the work. The ACGIH’s Industrial Ventilation manual is the reference of standard for the design and operation of ventilation systems. Ventilation systems requiring HEPA filtration should be challenge-tested at least annually to verify their effectiveness.

14.3.12 Silica Exposure

The Subcontractor shall comply with 29 CFR 1926.1153, “Respirable crystalline silica”, and the additional SLAC vacuum cleaner requirements described below. Engineering controls such as wet methods and/or ventilation should be employed whenever dust-producing activities are anticipated. Further information may be found in Chapter 56 of the SLAC ES&H Manual.

Subcontractors shall:

- Designate a respirable crystalline silica competent person and ensure that person carries out all required duties.
- Have their own [29 CFR 1926.1153](#)-compliant written silica exposure control plan for their employees potentially exposed due to work activities. This plan shall be submitted to SLAC as part of their site-specific safety plan (see [Chapter 42, "Subcontractor Safety"](#)).
- Train workers in silica control as required by [29 CFR 1926.1153](#)
- When required by 29 CFR 1926.1153, implement a medical surveillance program for their own employees
- Ensure silica control equipment is properly maintained and utilized
- If vacuuming is the control method selected, vacuums with HEPA filtration are required.

SLAC Specific Requirements and Procedures Regarding HEPA Vacuums

- HEPA vacuums used for silica control must undergo annual emery oil aerosol or equivalent challenge testing and be certified as in passing condition before work commencing. Vacuum testing must include checking around the exhaust vents and the canister/filter housing seals. Before a third-party vendor performs HEPA filter testing, it is advised that the vacuum cleaner owner change the collection bag and inspect the unit for wear and damage.
- Subcontractors must have their silica-control HEPA vacuum cleaners undergo HEPA filter efficiency testing, as described above, before use at SLAC. The date of the vacuum testing must be no earlier than a year before the end of the SLAC project. Documentation of third-party certification of HEPA filter efficiency must be provided to the SLAC project manager.

14.3.13 Lead Program

Refer to Division 2, specification SECTION 028300 - LEAD-RELATED CONSTRUCTION AND REMEDIATION if lead containing materials are part of the construction scope.

14.3.14 Hexavalent Chrome

The Construction Industry Chromium (VI) Standard (29 CFR 1926.1126) will apply to all work performed by the Subcontractor that may expose workers to airborne hexavalent chromium. The Subcontractor shall be responsible for compliance with all requirements of the Standard.

14.3.15 Asbestos

Refer to Division 2, specification SECTION 028200 – ASBESTOS REMEDIATION if asbestos containing materials are part of the construction scope.

14.3.16 Lasers

Class 1 laser systems incorporated into commercially available devices for use by the general public are exempt from these requirements, unless opened, serviced or modified. Laser equipment shall bear a conspicuously displayed label to indicate hazard classification.

Users of Class 1, Class 2, or Class 3R lasers shall be trained and the training shall be documented. The documentation will be kept with the red folder. Before a Class 2 or 3R laser is put into operation an area hazard warning signs will be posted. This sign must indicate type of laser, wavelength, power, and

classification. The signal word on the sign for Class 2 lasers: CAUTION. The signal word on the sign for Class 3R lasers: Danger. The FCM can provide warning sign templates.

Laser pointers have a 5mW limit. Allowable laser pointers at SLAC are labeled Class 2, Class 3a, or Class 3R. Others are not permitted.

Class 3B and Class 4 Laser shall not be used at SLAC.

14.3.17 Safety Showers and Eyewashes

Suitable facilities for quick drenching or flushing of the eyes and body (eyewash/shower apparatus) shall be provided within the work area for immediate emergency use where the eyes or body of any person may be exposed to injurious corrosive materials, (e.g., corrosives, skin sensitizers, etc.). An eyewash/shower apparatus shall be located such that it would require no more than 10 seconds to reach from the hazard. Access shall be free of any impediments. For battery handling areas, facilities for quick drenching of the eyes and body shall be provided within 25 feet.

Employees who may have a need for an eyewash/shower apparatus shall know where the nearest eyewash/shower apparatus is located and how to operate it. Monthly functional testing of eyewash/shower apparatus shall be documented. Portable eyewash stations are only allowed where a plumbed water source is not available. The potable water provided for a portable eyewash/shower apparatus shall be flushed or changed according to manufacturer's specifications.

14.3.18 Ionizing Radiation

A. As described in the Terms and Conditions, Article 18, radioactive materials, sealed radioactive sources, or devices that generate ionizing radiation shall not be brought on the SLAC site without express written permission of the SLAC Subcontract Administrator and Radiation Protection Department. Any Subcontractor needing to bring radioactive material, sources or radiation-generating devices onto SLAC property shall allow sufficient lead time in their schedule for SLAC's review and approval. Subcontractors shall coordinate submittal of the necessary information with the FCM.

B. Work at SLAC, designated as radiological work, shall follow the SLAC Radiological Control Manual.

Resources:

Terms and Conditions, Article 18, Environmental Protection Requirements

[Materials Restrictions \(Radiation Related\)](#)

[Radiological Control Manual](#)

14.3.19 Blood-Borne Pathogens

Employees who may reasonably be expected to be exposed to blood or other body fluids shall comply with OSHA requirements (29 CFR 1910.1030) relating to this subject. First aid kits shall contain "Universal Precautions" items, including chemical splash goggles, medical gloves, cardiopulmonary resuscitation (CPR) masks (with one-way valve), antiseptic hand cleaner, drying cloths, sharps containers, and red bags labeled "BIOHAZARD." Medical waste generated as a result of first aid response shall be placed in labeled red bags, and disposal coordinated through SLAC Occupational Health Services.

14.3.20 Other Health Hazards

Other hazards that may be present during the course of the Subcontractor's work which is not specifically addressed in this manual shall be identified by the Subcontractor and addressed in their JSA(s). Subcontractors are encouraged to discuss their potential hazards in advance with the PM, FCM, and FSR to ensure minimal impact to the project schedule and the smooth coordination of logistics.

14.4 Hazard Communication

Refer to Section 16.

14.5 Subcontractor Responsibilities

The Subcontractor shall be responsible for implementing an effective Industrial Hygiene program that:

- Identifies, evaluates, and controls potential and existing hazards/agents in the workplace through the pre-job safety planning process.
- Determines that engineering devices, administrative controls, and personal protective equipment are available, appropriate, tested, and utilized by employees.
- Determines employees are trained as required.
- Stops work that is not being safely performed.
- Reports occupational exposure data to affected employees in a timely manner

15 PERSONAL PROTECTIVE EQUIPMENT (PPE)

15.1 Applicability

The requirements of this section apply to all Prime Subcontractors' and sub-tier subcontractors' construction work activities at SLAC. This section provides the requirements for the use of personal protective equipment, where substitution, engineering or administrative controls are inadequate to fully protect the worker from hazards capable of causing injury, illness, or impairment of any bodily function.

15.2 Regulatory and SLAC Requirements

The selection, use, and design of PPE shall comply with the following requirements:

- 29 CFR 1910, Subpart I, Personal Protective Equipment
- Section 1926.100, "Head Protection" (29 CFR 1929.100)–
- Section 1926.102, "Eye and Face Protection" (29 CFR 1929.102)
- American National Standards Institute (ANSI) Z87.1-2003, "Practice for Occupational and Educational Eye and Face Protection" (ANSI Z87.1-2003)–
- ANSI Z89.1-2003, "Personal Protection Protective Headwear for Industrial Workers" (ANSI Z89.1-2003)
- ANSI/International Safety Equipment Association (ISEA) 107-2004, "High Visibility Safety Apparel" (ANSI/ISEA 107-2004)

- ASTM F2413-2005, “Standard Specification for Performance Requirements for Foot Protection” (ASTM F2413-2005)
- ANSI Z41.1, “Personal Protection – Protective Footwear” [replaced by ASTM F2412-2005]
- ES&H Manual Chapter 19, “PPE” (pertinent sections described herein)

15.3 SLAC Specific Requirements and Procedures

15.3.1 General Requirements

Personal protective equipment (PPE) is not a substitute for engineering and administrative controls. These controls shall be implemented, to the extent feasible, to mitigate the hazard so that the need for PPE is reduced or eliminated. Subcontractors shall provide PPE to its employees in accordance with OSHA requirements.

At a minimum, all Subcontractor personnel shall wear sturdy work shoes, long pants, and shirts with 4 inch sleeves. Personnel working on construction activities or entering the demarcated construction zone shall also wear safety toe boots, hard hats, safety glasses with rigid side-shields and reflective, high visibility traffic safety vests (minimum ANSI Class 2). Note: These requirements apply to all personnel, including delivery persons who exit vehicles and design professionals (e.g., architect, engineer).

The Subcontractor is responsible for supplying and requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions and/or where this manual indicates the need for using such equipment to reduce the hazards to the employees.

15.3.2 Training

Subcontractors shall provide training to each employee who is required to use PPE. Each affected employee must show understanding of training to their specific PPE. Retraining may be necessary if work activities change or the employee exhibits lack of understanding of the PPE.

15.3.3 PPE Hazard Assessment and Selection

The appropriated PPE for the work being performed shall be specified in the applicable JSA. The PPE selection shall be based on the hazard assessment results conducted for the work activity. Examples of applicable hazard assessment documentation include: JSA, Elevated Surface Work Plan, Confined Space Entry Permit, Hot Work Permit, and Electrical Work Plan.

15.4 Subcontractor Responsibilities

The Subcontractor shall:

- Perform an assessment identifying hazards or potential hazards and determine necessary PPE for activities to be performed;
- Include PPE requirements in project JSAs, as applicable;
- Adhere to prescribed SLAC postings and/or SLAC pre-job planning documentation requiring use of PPE;
- Provide adequate PPE for all its employees;
- Properly maintain, use and store PPE;

- Remove damaged and/or defective equipment from service; and,
- Provide appropriate training to PPE users and document through site-specific training, and/or daily safety meetings.

16 HAZARD COMMUNICATION

16.1 Applicability

The requirements of this section apply to all Prime Subcontractors' and sub-tier subcontractors' activities involving hazardous materials as they relate to the construction activities at SLAC. This section defines the requirements and responsibilities for the Subcontractors who use, apply, store or generate hazardous materials at SLAC.

16.2 Regulatory Requirements

The Subcontractor's program shall comply with 29 CFR 1910.1200, Hazard Communication.

16.3 SLAC Specific Requirements and Procedures

In addition to the requirements in Section 16.2, the Subcontractor's Hazard Communication program shall meet the following SLAC requirements as applicable.

16.3.1 General Requirements

The Subcontractor's Hazard Communication Program shall include hazard determination, Safety Data Sheets (SDS), labels and other forms of warning, employee information training, and a written Hazard Communication Program.

The Subcontractor shall provide a list of hazardous materials, and the SDSs for those materials along with the SSSP submittal at NTP. The submittal will be reviewed and accepted or denied before the work begins.

The Subcontractor is responsible for maintaining an up-to-date chemical inventory and copies of Safety Data Sheets (only of those chemicals brought on site). These shall be maintained with the Red Folder and made readily available for review by site workers, SLAC staff, and DOE staff.

Prior to using any newly introduce hazardous material or product, the Subcontractor shall obtain a copy of the appropriate SDS and submit the SDS to the FCM and FSR for review and approval. Approval is required prior to the material being brought to SLAC. The Subcontractor, FCM, and FSR shall review the JSA to determine if the steps and controls are adequate for the new hazardous material. The JSA will be updated and communicated to the workers, SLAC personnel, and other affected personnel.

Each original container of hazardous materials shall have the manufacturer's label affixed to it or be labeled, marked, or tagged showing the identity of the hazardous chemicals, the appropriate hazard warning, and the name and address of the chemical manufacturer, importer, or other responsible party.

Secondary and subsequent containers of hazardous chemicals shall be labeled, marked, or tagged prior to use with the identity of the hazardous materials and the appropriate hazard warnings.

16.3.2 Specific Communication Requirements

The Subcontractor shall determine, with review by the FCM and FSR, if their use of hazardous materials may affect (expose, or pose a potential danger in the event of an emergency) other Subcontractor or SLAC employees. If the hazardous materials form or the way it will be used creates a potential for affecting other employees, the Subcontractor shall take appropriate notification steps. The Subcontractor shall inform the other employer(s) of any precautionary measures that need to be taken to protect other Subcontractor and/or SLAC employees from inadvertent/unnecessary exposure to the Subcontractor's hazardous materials during normal operating conditions and in foreseeable emergencies.

Work areas where chemical and/or biological hazards are known to pose an exposure potential shall be clearly designated as such (with signs, placards, postings, etc.) along with control requirements (PPE requirements, ventilation, authorization for access required, etc.).

16.4 SLAC Special Emphasis

Some chemicals have additional requirements for bringing on SLAC property. These include:

- Alkali metals
- Beryllium
- Perchloric Acid and other peroxide-forming chemicals
- Unstable, reactive, pyrophoric or explosive chemicals
- Hydrofluoric acid
- Radioactive materials
- Highly toxic chemicals and reproductive toxins (depending upon the form, the quantity and method of application or use)
- Pesticides/Herbicides
- Bio-chemicals

Use of these chemicals at SLAC may necessitate additional control mechanisms such as establishing dedicated use areas, specific postings/warning signs, notification to adjacent workers, ventilation controls, decontamination procedures, personal hygiene facilities, etc. The Subcontractor shall notify the FCM and FSR prior to bringing any of these materials on site.

16.5 Subcontractor Responsibilities

The Subcontractor shall be responsible for:

- Administering their Hazard Communication Program.
- Maintaining an on-site list of hazardous materials and SDSs to be used on the project.
- Determining the hazards of materials used in the workplace, making SDSs available to employees, labeling containers, and providing information and training to employees on hazardous materials.
- Developing work practice requirements for hazardous materials and documenting in the JSA.

- Bringing on-site only those chemicals needed to perform the work for which they are contracted, and only in quantities needed for the job at-hand.
- Identifying when the Subcontractor's use of hazardous materials may affect (expose, or pose a potential danger in the event of an emergency) other Subcontractor's, or SLAC's, employees and taking appropriate notification steps.
- Storing chemicals in accordance with SLAC and code requirements.
- Remove chemicals from the work area and properly dispose of them when no longer needed.
- Comply with exposure monitoring and medical surveillance requirements associated with chemical use.

17 CONFINED SPACE

17.1 Applicability

The requirements of this section apply to subcontractors' activities which require personnel to work in permit-required and non-permit-required confined spaces at SLAC.

17.2 Regulatory and SLAC Requirements

The Subcontractor confined space entry program and the associated work activities conducted in permit-required and non-permit-required confined spaces shall be accordance with the following statutory requirements:

- 29 CFR 1910.146, Permit Required Confined Spaces
- 29 CFR 1926, Subpart AA, Confined Spaces in Construction
- SLAC ES&H Manual Chapter 6, "Confined Space" (pertinent sections described herein)

17.3 SLAC Specific Requirements and Procedures

In addition to meeting the OSHA requirements in Section 17.2, all work activities conducted in permit-required and non-permit-required confined spaces shall meet the following SLAC requirements.

Note: Confined space rescue is non-entry at SLAC. If a confined space requires entry to perform rescue, additional requirements will be implemented.

17.3.1 Confined Space Work at SLAC - General

If known at the time of contracting, SLAC will include information on the need for confined space entry in the request for proposal (RFP). SLAC will describe the confined space, whether it is permit-required or non-permit-required, the known hazards of the space, and the purpose for entry. Subcontractors who will be required to enter a confined space shall have a Confined Space Program as part of their Safety Manual. This program will be reviewed for compliance with regulatory requirements and SLAC's program. SLAC will require the Subcontractor to have a competent confined space person, workers who are properly trained in confined space entry (entrants and attendants), and all the necessary equipment to perform work in the confined space. Compliance verification is further described in section 17.3.4.

SLAC's confined space permits and forms shall be used (or equivalent SLAC-approved forms) including Entry Permit, Alternate Entry Form, Non-permit Confined Space Entry form, and Temporary Declassification Form.

S&H Data Requirements:

[Entry Permit](#)

[Alternate Entry Form](#)

[Non-permit Confined Space Entry form](#)

[Temporary Declassification Form](#)

17.3.2 Confined Space Classification

Confined spaces are classified as permit-required or non-permit-required based on the actual and/or potential hazards related to entry into the space. Prior to entry, all confined spaces will be evaluated and classified based on the actual and/or potential hazards related to entry into the space. Confined space classification is performed in advance of entries by the Subcontractor communicating with the FCM, the FSR, and the SLAC SME.

17.3.2.1 Labeling and Signage

Existing confined spaces are labeled as **Permit-Required** or **Non-Permit Required**. Constructed or fabricated confined spaces will be labeled by the Subcontractor, following SLAC's requirements.

17.3.3 New or previously unidentified confined spaces

There is a possibility that construction activities may create new confined spaces (such as new utility vaults, manholes, ventilation ducts, tanks, sumps, and/or elevator pits). It is also possible that, during construction, Subcontractors may encounter a confined space that had not been previously identified. During project design, SLAC will attempt to identify situations that may result in the creation of new confined spaces; however, it is not always possible to anticipate every potential confined space.

It is the Subcontractor's responsibility to watch for new or previously unidentified confined spaces and to inform the SLAC FCM and FSR whenever new confined spaces are identified or created.

17.3.3.1 Identifying a confined space

As defined by OSHA a confined space is:

- Is large enough and so configured that an employee can bodily enter;
- 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
- Is not designed for continuous employee occupancy.

17.3.3.2 Hazard Recognition

Confined spaces shall be considered hazardous until determined to be otherwise. Hazards will be identified and evaluated by a competent person prior to entry. The Subcontractor will continuously evaluate of confined space conditions and will stop work if hazards increase or change. Additional controls shall be implemented to control the new hazards.

17.3.4 SLAC Verification of Subcontractor's Compliance with Confined Space Entry

SLAC will require verification that the Subcontractor is able to safely perform confined space entries. SLAC will verify that the Subcontractor has the following:

- a confined space competent person;
- the entry team/authorized personnel - adequate number of workers to staff an entry team including entry supervisor, attendant, and entrant;
- Confined space training is current and documented;
- functioning, calibrated monitoring equipment and that their staff are familiar with the use of the equipment; and
- appropriate PPE, ventilation equipment, supplemental lighting if necessary, rescue equipment/plan;
- the appropriate confined space entry form

17.3.4.1 Confined Space Entry Controls

Entries into confined spaces shall be controlled either through administrative controls for non-permit confined spaces or through the permit procedure for permit-required confined spaces. Controls for confined space entries include, but are not limited to:

- Mechanical ventilation;
- Use of isolation procedures (LOTO);
- Cleaning of confined space;
- Electrical precautions;
- Fire precautions;
- Pre-entry monitoring of the air in the confined space (Note: This applies to permit and non-permit required spaces);
- Continuous monitoring of air during entry into permit-required confined spaces;
- PPE; and
- Communication procedures.

The careful and accurate use of the various entry forms will aid in managing the entry properly.

17.3.5 Confined Space Entry Notification

The Subcontractor will coordinate with the FCM and FSR for confined space entries. The SLAC SME is available to provide guidance and direction.

17.3.6 Subcontractor Training Requirements

Subcontractors that are trained in accordance with the requirements identified in 29 CFR 1910.146, Permit Required Confined Spaces, and 29 CFR 1926, Subpart AA, Confined Spaces in Construction, will be considered as meeting the necessary confined space entry training requirements for working at SLAC. The Subcontractor shall provide SLAC proof of such training prior to the work being performed.

18 POWERED INDUSTRIAL TRUCKS (i.e., forklifts, extended-reach forklifts, etc.)

18.1 Applicability

The requirements of this section apply to the operation of powered industrial trucks such as forklifts and extended-reach forklifts.

18.2 Regulatory and SLAC Requirements

Powered industrial truck use shall adhere to the following:

- 29 CFR 1910.178, Powered Industrial Trucks
- 8 CCR 3650, Industrial Trucks
- 8 CCR 3657, Elevating Employees with Lift Trucks
- 8 CCR 3664, Operating Rules
- DOE Standard 1090, Hoisting and Rigging
- ASME B56.1, "Safety Standard for Low Lift and High Lift Trucks"
- SLAC ES&H Manual Chapter 48, "Powered Industrial Vehicles" (pertinent sections described herein)

18.3 SLAC Specific Requirements and Procedures

Operator shall be trained and proficient in Powered Industrial Vehicle (PIV) operation. Documentation of training shall be provided to SLAC.

Plan lifts carefully to ensure success. If any doubt, do a practice run without a load.

Operator shall ensure the area below the load will be secured (e.g., danger tape, spotter).

Operator and other workers involved in the lift shall determine if a load needs to be secured to the forks or backrest. If necessary, ensure the load is stable and well secured.

A Spotter is required when the operator's view is obstructed by the load or when operating in a congested area (due to people, work activities, or obstructions/tight spaces).

A Material Receiver is required when the load is to be lifted to or from a second floor or higher.

If a Spotter or Receiver is required, the Operator and Spotter or Receiver must conduct a pre-lift review. Operator, Material Receiver, and Spotter (if any) shall conduct a pre-lift review to evaluate and resolve any concerns and agree on communication methods (e.g., hand signals).

Barricade areas or use spotter to keep people out of areas beneath lifts.

Forks cannot be used as a hoist without specific fixture engineered for that purpose. Putting rigging straps directly on forks is prohibited. Use of such fixtures is encouraged but does also trigger the Lift Plan requirement. If such use is anticipated throughout a job, preparing a Lift Plan for its use up to the maximum allowable load is advised.

If traveling on SLAC roadways, load shall be secured to pallet rest or backrest.

PIVs must meet applicable standards, be maintained and stored properly, be inspected by the Subcontractor when first brought on-site, and be inspected before use each shift.

Operators in violation of safety requirements shall have their authorization to operate revoked until they are retrained.

S&H Data Requirements:

Inspection records.

19 HEAVY EQUIPMENT OPERATION

19.1 Applicability

The requirements of this section apply to the operation of heavy construction equipment such as backhoes, loaders, excavator, and dump trucks.

19.2 Regulatory and SLAC Requirements

29 CFR 1926 Subpart O - Motor Vehicles, Mechanized Equipment, and Marine Operations

8 CCR 1590 – 1597 (Hauling, Earth Moving, Jobsite Vehicles)

19.3 SLAC Specific Requirements and Procedures

- Prime Subcontractors shall provide close oversight of heavy equipment operators at the start of their work on the project site to ensure they are adequately skilled. Any concerns about competence shall be immediately addressed. Subcontractor shall stop the operator's operation of the equipment until the matter is resolved.
- Ensure that all operators have been trained on the equipment they will use
- Operators shall be apprentice or journeyman Operating Engineers (Construction Equipment Operators). Documentation of certification shall be provided and kept with the SSSP/Red Folder.
- All vehicles must be in good repair and all brakes, lights, horns, backup signal, etc. fully functional.
- Check vehicles at the beginning of each shift to ensure that the parts, equipment, and accessories are in safe operating condition. Repair or replace any defective parts or equipment prior to use
- Equipment operators must be aware of workers on foot. And employees on foot must be aware of heavy equipment and shall maintain eye contact with the operator when passing in front.
- Seatbelts must be in good working order and shall be used.

S&H Data Requirements:

Equipment Inspection Documentation

20 TRAFFIC SAFETY

When construction operations affect SLAC's roads, traffic control measures must be implanted in accordance with standard practice on California roads (i.e., Calif. MUTCD requirements) and the Temporary Traffic Control Plan Procedure in SLAC's ES&H Manual Chapter 13. For further information, refer to the Traffic Control requirements in specification SECTION 015000 TEMPORARY FACILITIES AND CONTROLS.

S&H Data Requirements:

[Temporary Traffic Control Plan Procedure](#) (from Chapter 13 of ES&H Manual)

[Temporary Traffic Control Plan Approval Form](#) (from Chapter 13 of ES&H Manual)

Resources:

SECTION 015000 TEMPORARY FACILITIES AND CONTROLS

21 AERIAL LIFTS (SCISSOR, BOOM)

The Subcontractor shall ensure that lift operators are trained and qualified to operate the lift in accordance with 29 CFR 1910.66 to 68 and 29 CFR 1926.450 to 454 and CCR Title 8 § 3646-48. A Certificate of Training shall be provided to SLAC, prior to commencement of such work.

Ensure toeboards are in place.

Secure areas (barricade or spotter) beneath work location to prevent injury from dropped material or tools.

Use full body harness and fall restraint fixed lanyard in boom lifts.

Inspect equipment daily.

S&H Data Requirements:

Equipment Inspection Documentation

22 MATERIAL HANDLING – MANUAL

22.1 Applicability

The requirements of this section apply to the manual handling, moving and lifting material and equipment.

22.2 Regulatory and SLAC Requirements

Manual material handling shall adhere to the following:

- American Conference of Governmental Industrial Hygienists (ACGIH). Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs)-2005 (ACGIH TLVs and BEIs-2005)
- SLAC ES&H Manual Chapter 54, "Ergonomics" (pertinent sections described herein)

22.3 SLAC Specific Requirements and Procedures

Ergonomic related injuries due to manual material handling can be prevented through careful job hazard analysis.

Lifting hazard analysis must conform to the ACGIH TLVs for Lifting.

To analyze lift hazards, one must know the weight, how it will be picked up, the starting and ending location of the lift, and the frequency of the lift.

Lifts greater than 30 pounds are of particular concern but the ACGIH TLVs provide comprehensive guidance based on frequency and start/stop location.

The identified controls must be included in JSAs and Daily Tailgate forms and reinforced in daily pre-task meetings with workers.

Lifting aids, two-person lifts, and careful selection of workers are all important considerations.

23 PRESSURE SYSTEMS SAFETY

23.1 Applicability

The requirements of this section apply to the pressure systems testing and verification.

23.2 Regulatory and SLAC Requirements

Pressurized systems design and pressure testing shall adhere to:

- American Society of Mechanical Engineers (ASME) Boilers and Pressure Vessel Code, sections I through XII including applicable Code Cases, (2015).
- ASME B31 Series (ASME Codes for Pressure Piping) as referenced in 10 CFR 851 and SLAC's Worker Safety and Health Program.
- California Plumbing Code and Mechanical Code (current editions)
- ES&H Chapter 14 - Pressure Systems (pertinent content contained or referenced herein)

Refer to the piping, plumbing and pressure vessel project specifications for more information:

23.3 SLAC Specific Requirements and Procedures

Pressure tests must be planned carefully. Submit Pressure Test Plans prior to any pressure tests for pressure vessels and piping. The plans must be approved by SLAC's Pressure Systems Program Manager or designee. Coordinate the review with the FCM.

Hydraulic tests are required. Pneumatic tests are approved on an exception basis.

Utilize safe work practices as described in the Pressure Test Procedures section of ES&H Manual Chapter 14 – Pressure Systems.

Pressure equipment and systems (such as water heaters, expansion tanks, pressure vessels, relief devices, piping, etc.) shall be in compliance with ES&H Manual Chapter 14.

Submit specifications and catalogs of pressure systems before placing orders.

Submit installation and maintenance manuals of pressure systems before installation.

Offer pressure systems for inspection and registration after installation.

S&H Data Requirements:

[Pressure Test Plan Form](#)

[Pressure Test Record Form](#)

Resources:

[Pressure Test Procedures](#)

24 BARRICADING HAZARDOUS AREAS

24.1 Applicability

The requirements of this section apply to the setting up and maintenance of barricades related to site hazards.

24.2 SLAC Specific Requirements and Procedures

The Subcontractor shall implement an effective barricade program to reduce the likelihood of injury due to someone inadvertently entering a hazardous construction zone. Moveable barricades, temporary guardrails, and stanchions with caution or danger tape are all examples of barricade methods.

Yellow tape shall be used to communicate “Caution” and red tape “Danger”.

A sign shall be placed on any barricade with the name and cellphone of the person responsible for the barrier, the reason for the barrier, and the primary hazard.

A worker may cross a yellow barrier provided he or she is aware of the hazards and necessary controls.

No one should cross a red barrier until permission and escort is granted by the Subcontractor’s superintendent.

25 VEHICLES – LOW SPEED

Vehicles that are used to carry personnel and equipment, outside the federally compliant passenger vehicle or light truck designation, shall meet the requirements of ANSI B56.8 or 49 CFR 571.500 as applicable. This clause is referring to “golf carts” and similar low speed vehicles.

26 DECOMMISSIONING AND DEMOLITION

26.1 Applicability / Introduction

Refer to Section 8 for electrical demolition requirements for demolition associated with construction projects.

During the decommissioning phase, all buildings, utility systems, infrastructure systems and related facilities at SLAC will be dismantled and/or demolished safely and efficiently using appropriate personnel, procedures and work controls. Refer to the following specification sections for more information: SECTIONS 017419 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, 024113 – SELECTIVE SITE DEMOLITION, 024116 – STRUCTURE DEMOLITION, 013543 – ENVIRONMENTAL PROTECTION, or other related sections.

27 ENVIRONMENTAL REQUIREMENTS

Refer to specification SECTION 013543 - ENVIRONMENTAL PROTECTION for environmental protection requirements.

APPENDIX: S&H DATA REQUIREMENTS LIST (S&H FORMS, PLANS, PERMITS AND OTHER DATA REQUIREMENTS)

See Table below.

Notice: The table of data requirements may not be inclusive. The Subcontractor is responsible for providing all data required by the subcontract.

APPENDIX: S&H Data Requirements List (S&H Forms / Plans / Permits and other Data Requirements)

Notice: The following list of data requirements may not be inclusive. Likewise, some data requirements will not apply to certain projects according to the project scope and risk. Subcontractor is responsible for providing all data required by the subcontract.

ID #	Title	References	Date of First Submission	Submission Frequency	Distribution List	Remarks
01	Subcontractor Safety Qualification Form (SQF) and attachments (Safety Manual, OSHA Logs for 3 yrs., EMR proof, citations, explanations, Calif. Contractor’s license)	CSRM Section 4.2; ESH Manual Ch. 42	Prior to award	Once	SCM	Applies to Prime Subcontractor only. Not required if SLAC already has an approved SQF for the company on file. Forwarded to Project Safety for review.
02	Worker Safety and Health Program Acknowledgment Form	CSRM Section 4.3; ESH Manual Ch. 42	Post award; prior to NTP	Once - Prime; once - each subtier	Project	Online submission form http://www-group.slac.stanford.edu/esh/eshmanual/references/subcontractorFormWSHP.pdf
03	Site Specific Safety Plan Content and Approval Form	CSRM Section 4.4; ESH Manual Ch. 42	Post award; prior to NTP	Once – Prime; once - each subtier	SCM, PM, FSR	SLAC PM initiates; Prime Subcontractor completes for overall project and self-perform scope. Prime ensures sub-tiers complete prior to coming on site.
04	Job Safety Analysis form	CSRM Section 4.4.1; ESH Manual Ch. 2	Before work begins	As needed. Update as changes occur	PM, FCM, FSR	A JSA is for each Definable Work Activity.
05	Training Records, Certificates, Competent Person letters	CSRM Section 4.6	Submitted with SSSP	As needed	PM, FCM, FSR	Records must be maintained throughout the project as new staff join.
06	OSHA 30-hour construction safety training – Superintendents, foremen, Safety Representatives	CSRM Section 4.6; ES&H Manual Chapter 42	At SSSP submittal	Once – Prime; once - each subtier	SCM, PM, FCM, FSR	Training certificate submitted
07	SLAC Course 375 – Construction Safety Orientation	CSRM Section 4.6; Specification SECTION 013553 - Security, Site Access and Badging	Post award, prior to start of work	Annual	PM	Must complete prior to obtaining badge. Need SLAC PM to assist in obtaining SLAC ID so worker take the classes at any internet connected computer
08	SLAC Course 154 – Driving Safety	CSRM Section 4.6	Post award, prior to start of work	Annual	PM	Must complete prior to obtaining badge

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09	Facilities Course 101, Subcontractor Safety Management Training; ES&H Manual Chapter 42, Section 4	CSRM Section 4.6; http://www-group.slac.stanford.edu/esh/eshmanual/pdfs/ESHch42.pdf	Post award, prior to start of work	Refresher required every 3 years	PM	Required for all Prime Subcontractor superintendents/foremen and safety representatives (if required)
10	Safety Bulletin Board	CSRM Section 4.9	Before work begins	Once	N/A	Include DOE WSHP Poster and other postings per CSRM 4.9
11	Safety Inspections – weekly comprehensive – documented	CSRM Section 4.10	End of first week of mobilization	Weekly	PM, FCM, FSR	
12	Equipment Inspection Records (tag or log)	CSRM Section 4.10	Prior to use	Daily	FCM, FSR	
13	Weekly ES&H Report	CSRM Section 4.11	End of first week of mobilization	Weekly	PM, FCM, FSR	Completed by Subcontractor Safety Representative; available each Tuesday. Contents presented at Safety Stewardship meeting.
14	Subcontractor Safety Representative Daily Report	Division 1 Specifications – submittals; project management.	Close of each work day	Daily	PM, FCM, FSR	
15	Monthly Field Project Report	CSRM Section 4.11	First month after NTP	Monthly: 5 th business day of the month	PM, FCM, FSR	Including man-hours, incident/injury and property damage reports - Submitted to SLAC on a monthly basis within 5 days of the last working day of the month.
16	3-6 week look-ahead schedule	CSRM Section 4.13.8	Prior to start of work	Weekly	PM, FCM, FSR	Presented at weekly Safety Stewardship meeting by Subcontractor’s Safety Representative.
17	SSSP Presentation at Pre-Construction Meeting (“kick-off meeting”).	CRSM 4.13.2	Prior to start of work	Once	SCM, PM, FCM, FSR	Review of definable work activities, high hazard activities, plans and permits that will be needed
18	Daily Construction Work Review and GC Release Form	CSRM 4.13.5	Before work begins	Daily	FCM, FSR	SLAC FCM and GC Superintendent daily work planning meeting. FCM releases work to GC.

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19	Coordination/Tailgate Release Form	CSRM Section 4.13.6	Before work begins	Daily	FCM, FSR	GC Superintendent and subtier foremen daily work planning meeting(s). GC releases work to each sub-tier foreman.
20	Daily Tailgate/Work Coordination Meeting	CSRM Section 4.13.17	Before work begins	Daily	FCM, FSR	Daily meeting at start of day; GC Superintendent leads and all subtier foreman and all workers participate.
21	Safety Stewardship Meeting	CSRM Section 4.13.8	Week after mobilization	Weekly	PM, FCM, FSR	Content of ES&H report presented; 3-6 week look-ahead discussed; etc.
22	Occupational Medicine Program	CSRM Section 4.14	Before construction activity	Once	PM, FCM, FSR	
23	Project-specific Emergency Response Plan	CSRM 4.15	Post-award; prior to NTP	Once	PM, FCM, FSR	Part of SSSP submittal
24	Fire Prevention Plan	CSRM 11.3.1	Post-award; prior to NTP	Once	PM, FCM, FSR	Part of SSSP submittal
25	Radioactive materials and radiation generating devices: written approval prior to bringing on site	CSRM 14.3.18	5 days prior to on site	Varies	PM, FCM, FSR, SLAC RP	Materials Restrictions (Radiation Related)
26	Equipment Inspection Documentation: Powered Industrial Truck (e.g., forklift); Heavy Equipment; Aerial lifts; Drill rigs	CSRM Section 18, 19, 21	Upon delivery; Prior to first use; daily check	Daily	FCM, FSR	Forklift, crane, heavy equipment, scissor lift, man lift, boom lift, drilling rig, etc.
27	Elevated Surface Work Plan Include cut sheets of all equipment to be used.	CSRM Section 13.3.1.1	10 working days prior to any elevated work	Conditions change, new work/area/task	FCM	An approved elevated surface work plan is required before any worker accesses an unprotected elevated work area.
28	Hot Work Permit	CSRM 11.3.3; Fire and Life Safety: Fire Prevention Hot Work Procedures (SLAC-I-730-0A12C-001)	Prior to any hot work performed	Max: 8 days unless renewed.	FCM, FSR	Spark generating, open flame, welding (arc, MIG, TIG, etc.); Coordinate permit with FCM and FSR

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29	Pressure System Registration Procedure	CSRM Section 23; ESHM Ch. 14, Pressure Systems	Before operation	Once	FCM, FSR, Pressure System Program Manager	
30	Pressure Systems Inspection, Maintenance and Repair Requirements; Inspection Form	CSRM Section 23; ESHM Ch. 14, Pressure Systems	Before operation	Once	FCM, FSR, Pressure System Program Manager	
31	Pressure Systems Pressure Test Procedures: Test Plan form Test Record form	CSRM Section 23; ESHM Ch. 14, Pressure Systems	Before operation	Once	FCM, FSR, Pressure System Program Manager	
32	Electrical Work Plan (EWP)	CSRM Section 6.3.1	Before work begins	Prior to work	FCM, FSR, Facilities Elec. Engr	Subcontractor may prepare Method of Procedure which SLAC will then use to prepare the EWP. May require review by the SLAC Electrical Safety Officer
33	Group Lockout/Energy Isolation Plan	CSRM Section 5.3	Before work begins	Prior to work	FCM, FSR, Facilities System owner	No link provided for subcontractor use as SLAC FCM and Facilities staff will manage the lockout/energy isolation plan. Subcontractor will assist in preparation.
34	Complex Lockout Permit (sign on and off lockouts)	CSRM Section 5.3	Before work begins	Prior to work	FCM, FSR, Facilities System owner	No link provided for subcontractor use as SLAC FCM and Facilities staff will manage the Complex Lockout Permit. Subcontractor will sign on/off.
35	Electrical Energization Plan	CSRM Section 8.1	Before transition to permanent power	Once	PM, FCM, FSR, Facilities EE	Installation of new electrical circuits and equipment shall be substantially complete.
35	Crane operations: setup location survey	CSRM Section 12.3.3.6	Before setting up the crane	As-needed	FCM, FSR	If the location survey marks are not readable or identifiable by the time the crane or crane substitute is setup an additional survey will be completed prior to that setup.

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36	Crane Quarterly, Annual & Quadrennial Inspection Certifications	CSRM Section 12.3.4	Prior to crane mobilization	As-needed	FCM, FSR	
37	Crane Inspections – pre-shift operational	CSRM Section 12.3.4	Prior to use that day	Daily	FCM, FSR	
38	Crane Operators, Riggers and Signal person certification	CSRM Section 12.3.1, 12.3.2	Prior to the beginning of work	As-needed	FCM, FSR	
39	Lift Planning and Control Form (hoisting and rigging plan)	CSRM Section 12.3.3.1	10 working days before lift is performed	Prior to each activity	FCM, FSR, H&R Program Manager	
40	Excavation Permit	CSRM Section 10.3	14 days before excavating	Prior to each activity	FCM, FSR, and SLAC Excavation Program Manager	SLAC excavation procedures
41	Utility Locate Results Form	CSRM Section 10.3	14 days before excavating	Once	FCM, FSR, and SLAC Excavation Program Manager	
42	Mobile/Portable Drilling Rig Inspection Form	CSRM Section 10.3	Before use on site	Once	FCM, FSR, Excavation Program Manager	
43	Excavation Daily Inspection checklist	CSRM Section 10.3	First day of excavating	Daily	FCM, FSR, and SLAC Excavation Program Manager	Required on days excavation will be accessed.
44	Excavation Plan (written / drawn)	CSRM Section 10.3	10 working days prior to excavating	Once	PM, FCM, FSR	Excavations greater than or equal to 5 feet

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45	Confined space entry: Entry Permit , Alternate Entry Form , Non-Permit Confined Space Entry , Temporary Declassification Form	CSRM Section 17	Before entry	Prior to each activity	FCM, FSR	For permit entry, non-permit entry, alternate entry, temp. space declassification.
46	Traffic Control: Temporary Traffic Control Plan Procedure Temporary Traffic Control Plan Approval Form	CSRM Section 20	Before work impacting traffic commences	Prior to each activity	FCM, FSR, Security Manager	
47	Penetration Permit	CSRM Section 9	Before performing task	Prior to each activity	FCM, FSR, Radiation Protection	2 types of penetrations: Class 1: up to 2 inches Class 2: greater than 2 inches
48	Demolition plan	CSRM Section 26	After award, before work can commence	As-needed	PM, FCM, FSR	Incorporates ES&H Manual Chapter 27, 20, and 17 aspects. Plan examples available upon request.
49	Medical approval documentation (regulatory-required medical surveillance)	CSRM Section 4.4 (SSSP); 4.14 (Occup. Medicine Program); etc.	With submission of the relevant SSSP	Once	FCM, FSR	Asbestos, lead, hazardous waste work, respirator use, etc.
50	Project Specific Hazardous Communication Plan	CSRM Section 16	Post award; prior to NTP	Once	SCM/PM/FSR	
51	Written Safety Programs: Control of Hazardous Energy Program Electrical Safety Program Fall Protection Program Hearing Conservation Program PPE Hazard Assessment Respiratory Protection Program Spill Response Plan Heat Stress/Cold Stress Program	CSRM – various sections 29 CFR 1910 and 1926 – various sections 10 CFR 851	Some prior to award; some as part of submittals	Once	PM, FCM, FSR, SLAC Subcontractor Safety Program owner	Applies to Prime Subcontractor and/or sub tiers as appropriate.

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52	Incidents and near misses – immediate notification; subsequent reports	CSRM Section 4.15 Ts and Cs, Article 19	Notification: within 30 minutes. Reports: Within 24 hours	As-needed	PM, FCM, FSR	SLAC Occupational Health Clinic is available for first aid, initial treatment and diagnosis. FCM will coordinate required SLAC reporting forms
53	Final report	Section 01 74 19 Construction Waste Management and Disposal Section 01 78 23 – Operation and Maintenance Data	20 days after the completion of work and acceptance	Once	PM, FCM, SLAC Environmental Protection Department's Waste Minimization	<ol style="list-style-type: none"> 1. Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.) 2. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on-site facilities. 3. Complete summary of personnel monitoring. 4. Complete summary of air monitoring accomplished during the project (if applicable).

Reference:

ID Number – Sequential number to uniquely identify the entry

Title – Title (description) of Data Item with hyperlink

Reference – Location of data requirement/information in specifications, Terms and Conditions, etc.

Date of First Submittal – Initial date of submission (YY/MM/Day) or Identified as; #DAA - # Days after Award, #DBS - # Days before performance start, N/A – Not applicable, TBS – to be determined

Submission Frequency – DAILY – daily, WKLY – Weekly, MTLY – Monthly, QRTLY – Quarterly, ANNLY – Annually, ONCE – Once, ASREQ – As required, ONE/R – Once, and revisions as required,

ASGEN – As generated

Distribution List – Titles/Names of recipients

Remarks – Additional information as needed

Abbreviations:

SCM: Procurement

CSRM: Construction Safety Requirements Manual

ESHM: SLAC ES&H Manual