

LAWRENCE LIVERMORE NATIONAL LABORATORY
ENVIRONMENT, SAFETY, AND HEALTH (ES&H) PROVISIONS

The following clauses shall apply to any work and other activities performed by the Subcontractor or its lower-tier subcontractors under this Subcontract at any U.S. Government location managed or operated by Lawrence Livermore National Security, LLC (hereinafter “LLNS”), including the Lawrence Livermore National Laboratory (hereinafter “LLNL” or “Site 200”) and its Site 300 and, unless otherwise indicated, at any other performance locations except Subcontractor or lower-tier subcontractor facilities.

1. Definitions

As used herein, the following terms shall have the indicated meanings:

“ES&H Submittals” shall mean all Subcontractor submittals describing how the Subcontractor will ensure the safety of all persons, property, and the environment in accordance with these ES&H Provisions and applicable laws and regulations. ES&H Submittals include, without limitation, the JHA (see below definition), the Safety Plan, Task-Specific Submittals, and Subcontractor training records.

“Job Hazard Analysis” (JHA) is an ES&H Submittal generated using LLNS’ on-line LLNL TIP Tool and is designed to facilitate a structured, task-based approach to identifying and analyzing the tasks, hazards, and controls necessary to safely perform the work.

“Subcontractor” or “Employees” shall include the Subcontractor (or Seller) and all lower-tier subcontractors and their respective employees.

“Subcontract” shall also mean “Agreement” or “Purchase Order.”

“Safety Plan” shall mean a corporate or site-specific ES&H Submittal that documents the Subcontractor’s approach to complying with these ES&H Provisions and applicable ES&H laws and regulations.

“Subcontractor Area Hazards Control List” (SAHCL) identifies hazards present in the Subcontractor’s work area and the required controls that LLNS and the Subcontractor must implement to ensure no one is harmed by these hazards. The SAHCL also identifies any access or facility specific training and medical surveillance information that Subcontractor must have to perform in the work area.

“Task-Specific Submittal” shall mean an ES&H Submittal that documents the Subcontractor’s approach to performing a specific task or series of tasks in a manner that will ensure the safety of persons, property and the environment.

2. Worker Safety and Health Requirements

LLNS has established an *LLNL Worker Safety and Health Program* (LLNL WSHP) for all work performed at LLNL worksites, implementing the requirements of Subpart C of 10 CFR 851, including work performed by the Subcontractor and its lower-tier subcontractors.

LLNS specifies WSHP requirements in these ES&H Provisions, and the SAHCL. The Subcontractor demonstrates compliance with LLNS requirements by performing work in accordance with this Subcontract and its LLNS approved ES&H Submittals.

3. Integration of Environment, Safety, and Health into Work Planning and Execution

- (a) For the purposes of this clause, safety is understood to encompass safety, health, and environmental protection including pollution prevention, waste minimization and resource conservation; and employees is understood to include Subcontractor employees and lower-tier subcontractor employees performing work under this Subcontract, and LLNS employees.
- (b) In performing work under this Subcontract, the Subcontractor shall work safely, in a manner that ensures adequate protection for employees, the public, and the environment, provide a workplace that is free from recognized hazards with the potential to cause death or serious physical harm to workers, and be accountable for the safe performance of the work in accordance with all applicable ES&H requirements. The Subcontractor shall exercise a degree of care commensurate with the work and the associated hazards. The Subcontractor shall ensure management of ES&H functions and activities becomes an integral but visible part of the Subcontractor's work planning and execution processes.
- (c) The Subcontractor shall take adequate steps and precautions for the safety of, and shall provide adequate protection to prevent damage, injury, or loss to, the following:
 - (1) LLNS or Subcontractor employees involved in the Subcontract work and other persons who may be affected thereby.
 - (2) The completed Subcontract work in place, and other materials and equipment to be incorporated therein, whether in storage on or off the project site, under care, custody, or control of the Subcontractor.
 - (3) Other property that may be present at the project site and other adjoining areas.
- (d) The Subcontractor shall, in the performance of work, ensure:
 - (1) Subcontractor line management is responsible for the protection of employees, the public, and the environment. Subcontractor line management includes those employees managing or supervising employees performing work.

- (2) Clear and unambiguous lines of authority and responsibility for ES&H are established and maintained at all Subcontractor organizational levels.
 - (3) Subcontractor personnel possess the experience, knowledge, skills and abilities that are necessary to discharge their responsibilities. The Subcontractor shall remove its employees from work under this Subcontract if LLNS determines such employees incompetent or unfit for duty.
 - (4) Resources are effectively allocated to address ES&H considerations for the work to be performed; and protecting employees, the public, and the environment is a priority whenever activities are planned and performed.
 - (5) Work is performed in a manner consistent with LLNS' commitment to be a responsible steward of the environment as articulated in the LLNS Environmental Management System and as defined for the Subcontractor in these ES&H Provisions. In so doing, the Subcontractor shall comply with all applicable environmental regulations and any other requirements in this Subcontract and incorporate pollution prevention, waste minimization and resource conservation practices into the planning and performance of the work.
 - (6) Before work is performed, the associated hazards are evaluated and the ES&H standards and requirements contained or referenced in this Subcontract, are implemented or fulfilled by the Subcontractor, so as to provide adequate assurance that employees, the public, and the environment are protected from potential adverse consequences of the work to be performed.
 - (7) Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures, including the use of personal protective equipment as necessary.
 - (8) The “conditions and requirements” to be satisfied for work to be initiated and conducted are established and agreed-upon by LLNS and the Subcontractor. These agreed upon “conditions and requirements” are requirements of this Subcontract and binding upon the Subcontractor.
- (e) The Subcontractor shall manage and perform the work in accordance with a safety management system documented in a Subcontractor Safety Plan that fulfills all conditions in paragraph b above at a minimum. The Safety Plan shall describe how the Subcontractor will:
- (1) Fulfill the management responsibilities of these ES&H provisions;
 - (2) Implement the worker rights and impose the worker responsibilities of these ES&H provisions;

- (3) Define the work activities that will be performed;
- (4) Identify and analyze hazards associated with the work;
- (5) Develop or select applicable controls based on the hazards and requirements of this subcontract;
- (6) Ensure the controls work properly, and perform work within the controls;
- (7) Monitor work and provide feedback on adequacy of controls, and continue to improve safety management;
- (8) List the appropriate safety and health standards applicable to the work activity;
- (9) Minimize the negative impact to the environment, ensure compliance with applicable environmental regulations and satisfy the environmental requirements identified in the Subcontract;
- (10) Describe its injury/illness recording/reporting program;
- (11) List the applicable training for workers (excluding any LLNS site-specific training identified in this Subcontract);
- (12) Describe its occupational medicine program for workers if required; and
- (13) Describe its emergency procedures while on-site, for medical and fire response.

Additional safety documentation requirements are specified in Section 4, *Subcontractor ES&H Submittal Requirements*, Section 8, *Work Requirements for Protection of Persons and Property* and Section 9, *Work Specific Requirements for Protection of the Environment*.

- (f) The Safety Plan shall describe how the Subcontractor will establish, document, and implement safety performance of stated objectives and commitments. The Safety Plan shall also describe how the Subcontractor will measure its effectiveness.
- (g) The Subcontractor shall comply with, and assist LLNS and the U.S. Government in complying with, ES&H requirements of all applicable laws and regulations, and applicable directives identified in this Subcontract. The Subcontractor shall cooperate with LLNS, federal, state, and local agencies having jurisdiction over ES&H matters under this Subcontract.
- (h) The Subcontractor shall promptly evaluate and resolve any noncompliance with applicable ES&H requirements of this Subcontract and the ES&H Submittals. If the Subcontractor fails to provide resolution or if, at any time, the Subcontractor's acts or failure to act cause substantial harm or an imminent danger to the environment or health and safety of employees or the public, LLNS may issue an order stopping work in

whole or in part. Any stop work order issued by LLNS under this clause shall be without prejudice to any other legal or contractual rights of LLNS or U.S. Government. In addition, as part of any stop work order, LLNS may, at its discretion, withhold payments and rescind security access badges, until the Subcontractor submits or implements a satisfactory corrective action plan or cure proposal. In the event LLNS issues a stop work order, an order authorizing the resumption of the work may be issued at the discretion of LLNS. The Subcontractor shall not be entitled to an extension of time or additional fee or damages by reason of, or in connection with, any work stoppage ordered in accordance with this clause.

- (i) The Subcontractor is responsible for compliance with the ES&H requirements applicable to this Subcontract and for initiating, maintaining, and supervising all safety provisions, precautions, and programs in the course of the performance of this Subcontract.
- (j) The Subcontractor shall apply the ES&H requirements of this Subcontract to all lower-tier subcontractors to the extent necessary to ensure the Subcontractor's compliance with the ES&H requirements. The Subcontractor shall include a clause substantially the same as this clause in lower-tier subcontracts involving complex or hazardous work. Such subcontracts shall provide for the right to stop work under the conditions described in paragraph (h) of this clause.

4. Subcontractor ES&H Submittal Requirements

- (a) General

If required by the Subcontract, the Subcontractor shall submit for LLNS' review and approval the ES&H Submittals described in section (b) below. LLNS' approval of the Subcontractor's ES&H Submittals shall not relieve the Subcontractor from responsibility for any errors or omissions in such submittals or from responsibility for complying with the requirements of this Subcontract (including these ES&H Provisions) or any applicable laws or regulations. The Subcontractor shall not be entitled to a cost or schedule adjustment due to failure to submit acceptable ES&H Submittals.

If the Subcontractor's approach to performing the work changes and such changes necessitate revisions to LLNS-approved ES&H Submittals, or new ES&H Submittals are required, the Subcontractor shall provide such new or revised ES&H Submittals in writing to the LLNS Contract Analyst. The Subcontractor shall not proceed with the work necessitating the new or revised ES&H Submittal until such ES&H Submittals are reviewed and approved by LLNS, all required controls are implemented, and the Subcontractor is released to perform the work pursuant to section (c) below.

(b) Description of ES&H Submittals

When required by the Subcontract, the Subcontractor shall submit the following:

(1) JHA

The Subcontractor shall generate a JHA using LLNS' on-line LLNL TIP Tool. First time users will need to establish an account and complete the User Registration for access. The SAHCL number is needed for registration. This number must also be listed as part of the Project Title for tracking purposes when generating a JHA. Instructions for completing the LLNL TIP Tool to generate a JHA is located at: <https://supplychain.llnl.gov/jha/index.html>. A copy of the completed JHA shall also be provided to the LLNS Contract Analyst.

(2) Safety Plan

a) The Subcontractor shall submit to the LLNS Technical Representative (with a copy to the LLNS Contract Analyst) for review and approval a Safety Plan conforming to Section 3. *Integration of Environment, Safety, and Health into Work Planning and Execution*, above. The Subcontractor shall designate a responsible member of the Subcontractor's organization at the worksite who shall be responsible for ensuring compliance with ES&H requirements of this Subcontract and the Subcontractor's Safety Plan. A copy of the approved Safety Plan shall remain at the work-site at all times.

b) Additional areas which shall be addressed in the Safety Plan, where appropriate, include, but are not limited to, the following:

- Safety Measures: Specific safety measures required for the work and specific worksite and conditions, including the following functional areas, as necessary, in compliance with the applicable standards and provisions: construction safety; fire protection; firearms safety; explosives safety; pressure safety; electrical safety; industrial hygiene; occupational medicine; biological safety; and motor vehicle safety.
- Industrial Safety: Fire protection/prevention, fall protection, scaffolding, trenching, excavating, and/or shoring, pressure, steel erection, lockout/tagout procedures, working on de-energized and energized equipment, non-electricians working near energized equipment, and special considerations for programmatic equipment.
- Industrial Hygiene: Confined spaces; materials requiring special handling; welding and thermal cutting; surface preparation, priming, and painting; use of personnel protective equipment (including, but

not limited to, eye and face protection, headwear, foot protection, and respirators, as necessary); and use of chemicals, oils, solvents, paints, epoxies, adhesive, binders, and gases.

- Environmental Protection: Prevention of wash down, spilling, or release of water or liquids to ground, storm or sanitary sewer systems; management and use of hazardous materials; control of air emissions (e.g., cleaning solvents and portable generator permits); compliance with portable and stationery tank regulations, generation of nonhazardous, industrial and hazardous wastes; and protection of cultural, paleontological and biological resources.
- Waste Management: Management of all waste according to federal, state, and local regulations, cleaning up of spills, and the reporting of all spills (including water spills to uncontaminated areas exceeding 10,000 gallons) to the LLNS Technical Representative.

(3) Task-Specific Submittals

When required by the Subcontract, the Subcontractor shall submit to the LLNS Technical Representative (with a copy to the LLNS Contract Analyst) Task-Specific submittals, including any requested supporting documentation, to address safety requirements for specific tasks or work requirements as necessary to augment its other ES&H Submittals.

(c) Commencing Work

Performance of work at the LLNL worksite shall **not** commence until:

- (1) The LLNS Contract Analyst provides the Subcontractor written authorization to commence work.
- (2) Subcontractor personnel complete all training requirements specified in the Subcontract;
- (3) The Subcontractor conducts pre-job safety briefings with its personnel. The pre-job safety briefing shall ensure workers are acquainted with the work scope, the facility and activity-related hazards and their associated controls. The Subcontractor shall conduct pre-job briefings at the start of work and any new tasks and before allowing new workers to commence work. The level of formality shall be commensurate with the complexity of the tasks, the risks involved, mission-significance, and experience of the workers;
- (4) All necessary permits have been obtained. When identified in the SAHCL, there may be permits required for work at LLNL and Site 300 and special permits required for work in particular facilities or within certain directorates. LLNS is responsible for obtaining these permits and authorizations on behalf of the

Subcontractor, and the Subcontractor is responsible for scheduling the work to allow time to obtain these permits and complying with the requirements of the permits; and

- (5) The LLNS Technical Representative informs the Subcontractor the on-site work is “released”. The work release process helps ensure that, on a daily basis, the work can be safely performed in the specific work location considering other scheduled work and facility conditions. The release process may occur at various times during the project depending on the complexity of the work and facility conditions. The Subcontractor shall follow the LLNS Technical Representative’s instructions with respect to releasing the work throughout the period of performance of the Subcontract.

5. Management Responsibilities and Worker Rights

Subcontractor line management at the LLNL worksite shall:

- (a) Assign worker safety and health program responsibilities, evaluate personnel performance, and hold personnel accountable for worker safety and health performance;
- (b) If work dictates, use qualified worker safety and health staff to direct and manage the program (e.g., certified industrial hygienist or safety professional);
- (c) Involve workers and their elected representatives in the development of worker safety and health program goals, objectives, and performance measures, and in the identification and control of hazards in the workplace;
- (d) Provide workers with access to information relevant to the worker safety and health program, including:
 - (1) The Subcontractor’s ES&H Submittals, and any other relevant health and safety documents;
 - (2) Applicable Occupational Safety and Health Administration (OSHA) Form 300 or state equivalent information, subject to Freedom of Information Act restrictions; and
 - (3) LLNS-provided safety and health information, subcontract safety requirements and publications.
- (e) Permit workers to report, without reprisal, job-related fatalities, injuries, illnesses, incidents, and hazards and make suggestions for mitigating hazards; and promptly respond to such reports and suggestions;
- (f) Provide for regular communication with workers about workplace safety and health matters;

- (g) Permit workers to stop work or decline to perform task(s), without reprisal, if the worker reasonably believes that it poses an imminent risk of death, serious physical harm, or other serious hazard to workers, and there is insufficient time to utilize normal hazard reporting and abatement procedures; and
- (h) Inform workers of their rights, which include those listed below, by appropriate means, and by posting the incorporated 10 CFR 851 "IT'S THE LAW" worker protection poster where it is accessible to all workers.
 - (1) Access to the health and safety information described in (d), above;
 - (2) Right to notification when monitoring indicates overexposure to hazardous materials;
 - (3) Right to observe monitoring and receive the results of their own exposure monitoring; and
 - (4) Right to express concerns related to worker safety and health.

6. Hazard Assessment and Prevention

- (a) The Subcontractor shall assess and take appropriate preventive and abatement measures for all hazards, including environmental aspects, and assessments identified in the SAHCL and any ES&H Submittals.
- (b) The Subcontractor shall inform its workers of the hazards and protective measures associated with assigned work activities.
- (c) The Subcontractor shall instruct the workers to report to the Subcontractor's designated representative any hazards not previously identified or evaluated. If immediate corrective action for hazards not previously identified or evaluated is not possible or the hazard falls outside of work scope, the Subcontractor shall immediately notify the affected workers, post appropriate warning signs, implement needed interim control measures, notify the LLNS Technical Representative of the action taken, and, if necessary, stop work in the affected area until appropriate protective measures are established.
- (d) The Subcontractor shall routinely assess work place hazards produced from chemical, biological and safety hazards on the worksite.
- (e) The Subcontractor shall implement a hazard prevention and abatement process to ensure that all identified and potential hazards on the worksite are abated in a timely manner.

7. **Training and Information**

- (a) The Subcontractor shall ensure its workers exposed or potentially exposed to hazards are provided with the training and information on that hazard in order to perform their duties in a safe and healthful manner, including any required LLNL ES&H training or equivalent and any other training as required by applicable laws and regulations.
- (b) The Subcontractor shall provide:
 - (1) Training and information for new workers, before or at the time of initial assignment to a job involving exposure to a hazard;
 - (2) Periodic training as often as necessary to ensure workers are adequately trained and informed; and
 - (3) Additional training when safety and health information or a change in workplace conditions indicates that a new or increased hazard exists.
- (c) The Subcontractor shall also provide training and information to its workers who have worker safety and health program responsibilities as necessary for them to carry out those responsibilities.

8. **Work Requirements for Protection of Persons and Property** (As Applicable)

The Subcontractor shall comply with the following requirements and address them in its ES&H Submittals as applicable to the work.

- (a) Personal Protective Equipment (PPE)

The Subcontractor shall ensure employees wear appropriate PPE while performing the work and that all PPE is inspected regularly. Such PPE may and include, without limitation, hard hats, safety glasses, safety shoes, gloves, respirators, and any other specific PPE requirements identified in the SAHCL, LLNS approved ES&H submittals, or as otherwise required by applicable law or regulations, such as the following:

- ANSI Z87.1 “Occupational and Educational Eye and Face Protection”
- ANSI Z89.1 “Personal Protection – Protective Headwear for Industrial Workers”
- ASTM F 2413 “Performance Requirements for Foot Protection”
- ANSI Z88.2 American National Standard for Respiratory Protection

In addition, the Subcontractor shall ensure employees wear appropriate clothing. Subcontractor employees shall wear long pants and shirts with a minimum sleeve length of four inches; and, when work is performed in inclement weather or work locations subject to vehicle and/or heavy equipment traffic, they shall wear high visibility/reflective vests or other acceptable reflective clothing (ANSI/ISEA 107 class II).

(b) Hearing Conservation Program

When required by the SAHCL or LLNS-approved ES&H Submittals, the Subcontractor shall have a hearing conservation program to protect workers from hearing loss due to noise. The program shall consist of the following elements:

- (1) Identification of Exposed Personnel: Identify personnel who are exposed to noise in excess of the ACGIH Threshold Limit Value (TLV) for noise.
- (2) Worker Noise Protection: Notify workers who are exposed to noise above the TLV and provide them appropriate PPE. Demonstrate that the provided PPE reduces the noise to appropriate levels.
- (3) Engineered and Administrative Controls: Describe controls used to keep other workers' noise exposure, not identified in (1), to at or below 85 dBA based on an 8-hour time-weighted average.
 - a) If baseline noise monitoring has been established for similar activities, then submit to LLNS for review. Conduct noise monitoring for activities not previously base lined. All data shall be documented and kept at the job-site location.
 - b) At a minimum, the Subcontractor shall use the OSHA Required Method for Hearing Protective Device Attenuation, or:
 - c) Using sound level meter set to the A-weighting network, obtain representative sound level readings for the area and/or task and estimate the 8-hour Time Weighted Average (TWA). Subtract 7 dB from the NRR and subtract the result from the estimated 8-hour TWA (dBA).
- (4) Audiometric Testing: For workers identified in (1), perform audiometric testing as required by 29 CFR 1910.95. The Subcontractor shall ensure that audiometric baselines are provided to employees when exposed over the ACGIH 8-hour time-weighted average of 85 dBA within the first six months of being identified to participate in the Subcontractor's Hearing Conservation Program. Annual audiograms shall be provided thereafter.
- (5) Worker Training: Train workers to appropriately use established controls and PPE.

(c) Work Area Safety and Cleanliness

- (1) The Subcontractor shall keep the work location clean at all times and shall remove accumulated debris each day. If, in the opinion of the LLNS Technical Representative, the work location has not been kept clean and orderly or presents a potential safety, environmental, or fire hazard, LLNS may stop work

in the affected area and the Subcontractor shall immediately correct the defects. Painting and finish work shall not commence until work locations have been cleaned and dusted to the satisfaction of the LLNS Technical Representative. At the end of the work, the Subcontractor shall remove all debris, excess materials, tools, equipment, temporary buildings, barricades, empty containers, and like items, from the work location and shall clean all areas used in the performance of the work.

- (2) If, in the opinion of LLNS, any condition exists at the work location, caused by the Subcontractor, that may present a potential safety, environmental, or fire hazard, it shall be the responsibility of the Subcontractor to immediately correct the condition.

(d) Erection of and Compliance with Safeguards

The Subcontractor shall erect and maintain, as required by existing conditions and performance of the Subcontract, adequate safeguards for safety and protection, including providing adequate lighting and ventilation, barricades, posting danger signals and other warning signs against hazards, and promulgating safety regulations. The Subcontractor shall notify the LLNS Technical Representative.

In addition, the Subcontractor shall ensure personnel are aware of and comply with all site-specific hazard warning signs and barricades.

(e) Controlled Items and Materials (Require LLNS' advance consent to bring on-site)

The Subcontractor shall not use or bring any of the controlled items or materials listed below to the LLNL (Site 200 or Site 300) without the prior written approval of the LLNS Technical Representative. The Subcontractor's ES&H Submittals shall include detailed descriptions, plans and procedures for the use or storage thereof, or any unusual methods necessary for work execution. The Subcontractor shall exercise the utmost care and carry on such activities only under the supervision of properly qualified personnel.

- Asbestos products,
- Hazardous materials with SDS per paragraph 9(a) (6),
- Lead-based paint or lead-based paint materials (defined as having greater than 600 ppm lead),
- Corrosive or toxic materials,
- Flammable or combustible liquids,
- Radioactive materials,
- Radiation generating devices or equipment,
- Explosives, and
- Thoriated welding rods.

Note: Additional items that require LLNS' advance consent to bring on-site for security reasons are listed in the Security and Site Access Provisions.

(f) Confined Spaces

- (1) A confined space is a space that meets the following criteria: 1) is large enough for an employee to bodily enter; 2) has limited or restricted means of entry or exit; and 3) is not designed for continuous human occupancy. Confined spaces include, but are not limited to, elevator pits, vaults, HVAC plenums, and tanks.
- (2) If work requires entry into one or more spaces that meet the Federal OSHA definition of a permit-required confined space, submit a written confined space entry program document along with evidence of worker training that meets the requirements of 29 CFR 1910.146. The Subcontractor's confined space entry program shall include procedures for coordinating entry operations if both LLNL and Subcontractor personnel will enter the confined space.
- (3) Subcontractor shall perform all entries into confined spaces at the work location in accordance with ANSI Z88.2 and 29 CFR 1910.146 and its LLNS-approved confined space entry plan.

(g) Electrical Safety

At a minimum, the Subcontractor shall ensure the following safety measures are addressed when working with electricity:

- (1) **Qualification of Personnel:** All electrical work shall be performed by qualified electricians in accordance with 29 CFR 1910 Subpart S, and NFPA 70 and 70E, current versions.
- (2) If the Subcontractor discovers exposed, energized parts where none were expected, particularly during testing of tagged-out circuits, or any other unexpected or unusual electrical event or condition, then the Subcontractor shall stop work immediately and contact the LLNS Technical Representative for guidance before proceeding.
- (3) **Working on Energized Equipment:** If work on energized circuits or equipment is anticipated during this project, address this work in the Safety Plan and provide persons qualified to perform such work, along with all necessary safety equipment specified in 29 CFR 1910 and NFPA 70E. Notify the LLNS Technical Representative 14 calendar days in advance of working on energized equipment.
- (4) If, in the course of the work, non-electricians may be required to work near exposed, energized equipment, the Subcontractor shall notify the LLNS Technical Representative 14 calendar days in advance of performing the work. The LLNS Technical Representative may provide guidance for performing such work. The Subcontractor shall not commence work without the LLNS Technical Representative's approval.

- (5) If the Subcontractor will be working near potentially hazardous electrical equipment (e.g., aerial lift work in vicinity of high voltage lines) in the course of this Subcontract, the LLNS Technical Representative may provide guidance for working in the vicinity of such equipment. The Subcontractor shall submit methods/controls to prevent hazardous exposures. The Subcontractor shall not commence work without the LLNS Technical Representative's approval.
- (6) All electrical equipment, components, conductors, and other electrical material used by the Subcontractor shall be of a type that is listed, labeled, or tested by a Nationally Recognized Testing Laboratory (NRTL) in accordance with 29 CFR 1910, *Occupational Safety and Health Standards*. If the Subcontractor wishes to furnish any materials, supplies, or equipment under this Subcontract that do not meet these requirements, the Subcontractor shall request LLNS approval to proceed in accordance with the Subcontract Safety-Related Requirements paragraph entitled "Safety Standards and Testing."

(h) Lockout/Tagout (LOTO)

If applicable, the Subcontractor's ES&H submittals shall include a plan for the isolation and control (lockout/tagout) of hazardous energy sources for equipment to be worked on in accordance with LLNS' requirements and the OSHA regulations at 29 CFR 1910.147, 29 CFR 1910.333, Subpart S, "Electrical", and NFPA 70E. Although the OSHA regulations permit the use of only a tag with no lock, this is not allowed at LLNL. Both a lock and tag are required. The Subcontractor shall coordinate all lockout and tagout of circuits in advance with the LLNS Technical Representative and shall not perform lockout before obtaining the LLNS Technical Representative's approval to proceed. The Subcontractor shall not allow its workers to perform LOTO for others. Each affected worker shall apply its own lock and tag. If the Subcontractor encounters a device that cannot be locked, then it shall obtain guidance from the LLNS Technical Representative before proceeding.

(i) Laser Safety

All work with lasers shall be conducted in accordance with ANSI Z136.1, *Safe Use of Lasers*. Submit a laser safety program if working on or operating a Class 3B or 4 laser.

(j) Scaffolding, Ladder Safety and Fall Protection

Before using scaffolding, all personnel must complete a scaffold user training course. The Subcontractor shall ensure all scaffolding is erected, maintained, and disassembled under the supervision of a competent scaffold person by properly trained workers. The Subcontractor shall have daily inspections conducted by a designated competent scaffolding person and by the user before access. Makeshift scaffolds are not permitted.

The Subcontractor shall use personal fall protection when working from a ladder when the midsection of the worker's torso (i.e., belt buckle) is outside of the side rails of the ladder, or if it is necessary to work backwards from a ladder. Wherever possible, work on ladders shall be performed so the worker is able to face the ladder and maintain three points of contact when climbing or descending. Materials and tools should be raised and lowered by a rope or other mechanical means. All portable ladders must be tied off or secured to prevent being displaced when the worker's feet are above six feet. Stepladders should be tied off whenever possible.

If applicable, submit a fall protection plan in compliance with 29 CFR 1910 Subpart D.

(k) Aerial Lifts and Self-Propelled Elevating Work Platforms

Aerial lifts include any manual vertical aerial platforms, powered vertical aerial platforms, and boom-supported aerial platforms (e.g., extensible boom platforms, articulating boom platforms).

The Subcontractor shall ensure lift operators are trained and qualified to operate aerial lifts in accordance with 29CFR 1910.66 to 68.

All aerial lifts and self-propelled elevating work platforms shall only be operated by authorized and qualified workers in accordance with the manufacturer's instructions. The Subcontractor's lift operators shall perform a workplace inspection before use and document the inspection results. The Subcontractor must obtain the LLNS Technical Representative's approval if necessary to exit lifts or platforms from a height.

If traveling 50 feet or more, the platform shall be in the lowered or stowed position. Extensible or articulating booms should be retracted or folded. LLNS requires the use of fall restraints and a body harness attached to an anchor point on the basket.

(l) Hand and Power Tools

All tools shall be undamaged and in proper working order, contain all required tool guards and be tethered to prevent dropping when working on elevated platform. Only qualified Subcontractor personnel shall use power tools.

(m) Cranes, Hoists, and Rigging

The Subcontractor shall perform all hoisting and rigging activities at LLNL in accordance with 29 CFR 1910 Subpart N, *Materials Handling and Storage* and 29 CFR 1926, *Safety and Health Regulations for Construction Subpart CC – Cranes & Derricks in Construction* and *Subpart R Steel Erection*. Plan and execute lifts of personnel, such as using a hoisting device or basket, in accordance with 29 CFR 1926.1431 and SME B30.23.

Hoisting and rigging activities include use of the following equipment or devices:

- Mobile cranes
- Facility cranes
- Forklifts with lifting attachments
- Chain falls
- Come-a-longs
- Gantries
- Industrial grade and/or rated: Jacks, Rollers, Dollies, Skates/Skids, SPMT's (Self Propelled Modular Transporters), Pushers/Pullers)
- Rigging equipment, such as slings, rigging hardware, below-the-hook lifting devices, etc.

LLNS exceeds OSHA requirements in the categorization and planning of lifts. See hoisting and rigging requirements in Appendix A of these provisions.

(n) Welding, Burning or Fire Producing Activities

The Subcontractor shall perform all welding in accordance with ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes, sections 4.3 and E4.3. The Subcontractor shall not use thoriated welding rods without LLNS approval.

As part of LLNS' program to control fire hazards and negative environmental impacts, burn permits are required for welding, soldering, and other hot-work operations with a high fire potential. The LLNS Technical Representative will obtain permits from the LLNL Fire Department for the following types of activities: Cutting and welding, heat treating, grinding, powder-driven fasteners, hot riveting, torching, soldering, using tar pots or tar kettles, using open fires for any purpose, barbecuing, and any other heat-producing, spark-producing tasks that could produce a fire hazard. All controls shall be followed as prescribed on the permit and permits shall be posted in the work area until the work is completed.

(o) Hot or Cold Environments

The Subcontractor shall comply with the thermal stress (cold and hot) recommendations in the American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices".

(p) Roof Access

Hazards associated with roof access may affect personnel accessing facility roofs and building occupants. Hazards include exhausted gases, fumes, or particles from rooftop stacks, chemical hoods, glove boxes, hot water boilers, and building sewer systems. Other potential hazards include exposure to ionizing and non-ionizing radiation, electrical shock, moving machinery, explosive hazards, or contamination from previous operations or experiments. There are also fall hazards related to working at heights, slips, trips, skylights, and ladder use. LLNL roofs are classified as "General

Access” or “Restricted Access”, depending on the hazards associated with accessing the roof. Access policies and controls vary among facilities within both classifications. An LLNL Roof Access Permit may be required to authorize work activities for certain locations. The LLNS Technical Representative will obtain prior authorization and required LLNS permits to release activities to be performed on LLNL rooftops. The Subcontractor shall ensure that all required procedures are followed for roof access.

9. Work Specific Requirements for Protection of the Environment (As Applicable)

The Subcontractor shall ensure work is performed in a manner consistent with LLNS' commitment to be a responsible steward of the environment. In so doing, the Subcontractor shall comply with all applicable environmental regulations and any other requirements in this Subcontract and incorporate pollution prevention, waste minimization and resource conservation practices into the planning and performance of the work.

(a) National Environmental Policy Act

All activities at the site must be previously reviewed and approved through the NEPA process prior to activity commencing.

(b) Pollution Prevention

The Subcontractor shall incorporate pollution prevention into work planning and performance. In the event of any release of hazardous materials into the environment, the Subcontractor shall immediately notify the LLNS Technical Representative. In addition, the Subcontractor shall contain, repair and clean up any such leaks or discharges into the environment and provide written reports of any such incidents as directed by the LLNS Technical Representative.

(1) Storm Water Pollution Prevention

- a) For any outdoor work in the areas covered by the California State Water Resources Control Board Industrial General Storm Water Permit (IGP) (2014-0057-DWQ), work must comply with the IGP as well as the Industrial Activities Storm Water Pollution Prevention Plans (SWPPPs). These areas include the Decontamination and Waste Treatment Facility (DWTF) as well as the B-612/625 complex at the Livermore site and B-883, B-845b and the Explosive Waste Storage Facility at Site 300. Copies of LLNS' Industrial Activities SWPPPs for the Livermore Site and Site 300 and the current IGP are available for Subcontractor review upon request.

Include the following five paragraphs (b-f) under subpart 1.02 for projects involving land disturbance of less than one acre in area, for example, landscaping projects with potential for ground disturbing work and storm water impact, and/or projects determined to be environmentally significant.

- b) For projects with potential for stormwater impact, the Subcontractor shall maintain continual storm water pollution prevention and perform all work to ensure no pollutants are discharged into the storm drainage system. Failure to comply may result in LLNS halting work until the Subcontractor performs remedial actions. Refer to Appendix B for applicable Best Management Practices (BMPs).
- c) The Subcontractor may substitute alternate pollution prevention measures for those identified in contract erosion control documents and Appendix B. Submit alternate measures for LLNS review. LLNS approval of alternate pollution prevention measures does not relieve the Subcontractor of responsibility for the quality and adequacy of the measures or Subcontractor implementation of them. Such acceptance does not warrant, acknowledge, or admit the quality and adequacy of the alternate pollution prevention measure.
- d) Erosion control matting or similar materials may not include plastic monofilament.
- e) Provide all materials and labor required to implement and maintain pollution prevention measures.
- f) If pollution is leaving the project site, implement necessary corrective measures. Failure to comply with these requirements may result in criminal and civil liability of the Subcontractor under the Clean Water Act.
- g) The following measures ensure that “non-construction” activities do not negatively impact storm water quality and receiving waters as required by the San Francisco Bay Region Municipal Regional Stormwater Permit Order No. R2-2009-0074 for the Livermore Site and the Phase II Small MS4 General Permit for Site 300. The portion of the MS4 permit that best describes the activities at Site 300 is Non-Traditional Small MS4 Permittees 40 CFR 122.26(b)(16).

(Note: The Industrial General Permit Storm Water Pollution Prevention Plans for the Livermore Site and Site 300 document storm water requirements for the Industrial General Permit regulated portions of LLNL.)

- Enclose painting operations, as appropriate, to be consistent with local air quality regulations and the Occupational Safety and Health Act (OSHA).

- Cover and properly store materials of particular concern (e.g., soil piles, chemical storage, paints) that are exposed to weather, especially during the rainy season.
- Properly store and dispose of waste materials generated from the activity. See Factsheet WM-5 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- Provide spill response training for personnel who handle hazardous materials. Subcontractor must notify LLNS of any spills.
- Maintain good housekeeping practices while work is underway, and remove debris in a timely manner.
- Prevent discharges of non-permitted wastewater to the storm water drainage system.
- Washing and cleaning of vehicles and equipment shall be in designated area and shall prevent pollutants from discharging into storm water. See Factsheet NS-08 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- If vehicle fueling is necessary onsite, it shall be done in designated location. Procedures and practices shall be designed to prevent fuel spills and leaks, and reduce and eliminate contamination of stormwater. See Factsheet NS-09 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- If vehicle maintenance is necessary onsite, vehicle and equipment maintenance shall be in a designated area and shall prevent pollutants from discharging into storm water. See Factsheet NS-10 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- Contain and clean up waste generated by grinding, drilling, sanding, sandblasting and scraping. Use a vacuum for fine particle clean-up. Dispose of wastes properly.

(2) Materials and Waste Discharge

- a) The Subcontractor shall not discharge hazardous materials or wastes onto LLNL property or the environment (i.e., air, soil, surface water, and groundwater). The Subcontractor shall protect all routes of entry to the environment, including direct discharges into air, soil, surface water, storm sewer, sanitary sewer, wells, and drainage channels, from work activities. This shall be achieved by the safe and proper use and storage

of tools, equipment, and materials. Subcontractor shall inspect its equipment and vehicles daily for leaks of fuel, engine coolant, and hydraulic fluid. The Subcontractor shall contain, repair, and immediately report any leaks or accidental discharges into the environment to the LLNS Technical Representative.

- b) The Subcontractor shall not discharge any hazardous chemicals into the retention or sanitary system. All discharges to the sanitary sewer system must be approved by the LLNS Technical Representative.

(3) Discharges To Ground

The Subcontractor shall prevent discharges to the ground by doing the following:

- a) Notifying the LLNS Technical Representative of any unexpected subsurface conditions including unusual staining or other evidence of soil contamination.
- b) Dumping excess concrete in lined excavation pits only in locations identified and approved by the LLNS Technical Representative (not to ground). The Subcontractor shall remove all dried, excess concrete for proper disposal off site and report the total quantity disposed of and/or recycled to the LLNS Technical Representative.
- c) Discharging wash water from cleaning concrete trucks and concrete handling equipment in properly established evaporation pits identified and approved by the LLNS Technical Representative.
- d) Complying with all Spill Prevention, Control, and Countermeasure (SPCC) requirements in 40 CFR 112 including, but not limited to: storage of all oil and petroleum containers (e.g., gas and diesel) 55 gallons and larger in secondary containment sized to the largest container plus four inches of freeboard; monthly inspection of all oil containers 55 gallons and larger, daily inspection of fueling tanks 55 gallons and larger; maintenance of appropriate spill response materials, and the prevention and/or containment (e.g., drip pans) of leaking equipment.
- e) Assuring oil container inspectors and oil handlers (personnel moving or filling oil containers) receive SPCC training either from LLNS or provide LLNS with documentation of equivalent training. An annual training refresher is required to be taken by oil handling personnel and must be provided either by LLNS or the Subcontractor. The Subcontractor will be required to ensure that all aspects of the SPCC training are implemented on the site. Copies of LLNS' site wide SPCC

Plan for Site 200 or for Site 300 are available for Subcontractor review upon request.

- f) Providing all required inspections to the LLNS Technical Representative at a regular frequency or immediately if a spill or leak has occurred.

(4) Air Quality

- a) The Bay Area Air Quality Management District (BAAQMD) and the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) regulate the use of solvents in cleaning operations; the solvent content of chemical products such as paints, other surface coatings, sealants, adhesives; the use of gasoline and diesel power internal combustion engines, etc. These air districts also regulate the application methods and materials used in abrasive blasting, and have general requirements limiting visible air emissions and odor nuisance from any work. The Subcontractor shall ensure all products used and work conducted are in compliance with BAAQMD and SJVUAPCD regulations and the air permits issued to LLNL facilities in which work is performed. In particular, the Subcontractor shall ensure all stationary or portable equipment (e.g., generator, air compressors, lifts, etc.) with internal combustion engines rated greater than 50 horsepower is permitted in accordance with BAAQMD, SJVUAPCD (for Site 300), or California Air Resources Board (CARB). In addition, the Subcontractor shall supply all required information on materials used as required by applicable air permit(s) such as Safety Data Sheets (SDS). The Subcontractor shall maintain copies of these SDS in a readily accessible location on-site in accordance with local air quality district regulations (BAAQMD or SJVUAPCD).
- b) All persons working with equipment containing refrigerants shall be certified in accordance with Section 608 of the Clean Air Act. The equipment used for refrigerant recovery shall also be certified in accordance with Section 608 of the Clean Air Act, Subcontractor shall comply with the venting prohibition, service practice requirements, leak repair, safe disposal, and record keeping requirements of Section 608. All maintenance and equipment records pertaining to refrigeration units including but not limited to personnel training and certifications, equipment calibration, calibration procedures, and certifications shall be maintained by the subcontractor and made available to LLNS upon request.

c) Waste Minimization

The Subcontractor shall minimize waste through effective waste management and management of hazardous and non-hazardous materials used in during planning and performance of the work.

(5) Waste Management

Unless otherwise stated in the Subcontract, the Subcontractor shall be responsible for notifying LLNS of all wastes generated from hazardous materials used in the performance of the Subcontract. LLNS will manage all hazardous waste to ensure waste is stored, handled, and disposed of in accordance with applicable federal, state, local environmental regulations, and any approved ES&H Submittals.

- a) Hazardous waste generated at LLNL must be managed as hazardous waste by LLNS. This includes universal wastes such as electronics, batteries, and fluorescent light tubes, as well as paints, solvents, oils, and greases.
- b) Municipal Waste: The Subcontractor shall only dispose of waste items into the municipal waste cans or dumpsters that meet LLNS approved waste profile which includes: paper products, food waste, foam, plastic, rubber, etc. The Subcontractor is encouraged to utilize established paper and cardboard recycling bins to reduce the amount of municipal waste generated.
- c) If materials are being sent to an offsite disposal facility, the Subcontractor shall work with LLNS for approval.
- d) Managing Soil and Debris: Soil and debris must be characterized and evaluated for potential hazardous and/or radioactive contamination prior to reuse onsite or disposal offsite. Characterization is required for every new project by using existing soil analytical data from previous projects or by collecting and analyzing new, representative soil and/or debris samples. This process is triggered through the dig permit process.
- e) Recyclable Material: The Subcontractor shall encourage the collection and recycling of other municipal waste, e.g., glass, plastic and metal drink bottles, packaging material, compostable material (trees, wood, etc.), generated by the work.

(6) Subcontractor Use and Management of Nonhazardous and Hazardous Materials

LLNS has implemented a program to reduce or eliminate the use and release of certain toxic and hazardous chemicals and materials. The Subcontractor shall,

to the maximum extent possible without conflicting with the technical requirements of the Subcontract, reduce or eliminate the use and release of certain toxic and hazardous chemicals and materials by:

- a) Using environmentally benign solvents and solvent-free alternative systems that reduce or eliminate the use of hazardous substances and/or the generation of hazardous waste, and use of non-ozone depleting substances.
- b) Reusing and/or recycling surplus commodities and by-products.
- c) Implementing appropriate management practices for nonhazardous and hazardous materials brought on-site including, but not limited to:
 - Storing materials or waste away from storm drainage systems.
 - Using secondary containment berms for containers of liquid materials.
 - Performing inspection of storage areas.
 - Labeling containers appropriately.

Any hazardous waste generated by Subcontractor use of hazardous materials onsite (e.g., batteries, coatings, and empty containers) shall be managed by LLNS to ensure management in accordance with federal, state, and local regulations and LLNS-approved Safety Plan. In the event the Subcontractor must utilize Subcontractor-Provided Hazardous Materials, the Subcontractor shall furnish the following:

- d) Tracking and Reporting of Certain Types of Hazardous Materials: The use of certain hazardous materials must be tracked and reported to state and federal agencies. Discuss with the LLNS Technical Representative the types of hazardous materials to be used in work activities to determine if any materials must be tracked. The Subcontractor shall maintain all tracking documents identified by LLNS and provide the documents to the LLNS Technical Representative and to the ChemTrack Office (L-621) when the work activity is completed.
- e) Purchase of hazardous materials in container sizes and amounts that minimize the amount of excess material generated by the work.
- f) Safety Data Sheets (SDS): The Subcontractor shall submit SDS to the LLNS Technical Representative and ChemTrack Office (L-621) for all chemicals, oils, solvents, paints, epoxies, adhesives, petrochemical, or similar materials to be used at the work location. The Subcontractor shall store materials in containers in accordance with the requirements of the SDS within the work area boundary or as directed by the LLNS Technical Representative. The Subcontractor shall notify LLNS of all such materials not incorporated in the work so they can be managed and

disposed of in accordance with the applicable federal, state, and local regulations.

- g) **Hazardous Materials Inventory:** The Subcontractor shall also complete, and submit to the LLNS Technical Representative and the ChemTrack Office (L-621), the LLNL Hazardous Material Inventory form (form to be provided by the LLNS Technical Representative). Copies of the completed forms shall be retained, by the Subcontractor, with the SDS for the work. If any hazardous materials are to remain on-site at the end of the work, the Subcontractor must advise the LLNS Technical Representative and contact the LLNL ChemTrack Hotline (925) 424-4404.
- h) **Transportation of Hazardous Materials:** The Subcontractor shall comply with applicable federal and state regulations when transporting hazardous materials to the LLNL sites. In addition, the Subcontractor shall comply with all posted traffic signs and speed limits and follow applicable California Vehicle Code requirements while driving on the LLNL sites.

(c) **Resource Conservation**

The Subcontractor shall incorporate conservation of resources listed below during the planning and performance of work.

(1) **Conservation of Energy and Water**

To the maximum extent practicable, the Subcontractor shall implement conservation practices that will reduce the consumption of water and electricity. Reduction practices may include:

- a) Turning off electrical powered items (e.g., tools, office equipment, lights) when not in use.
- b) Turning off water source when not in use.
- c) Using water efficient products in work activities, where feasible.

(2) **Protection of Cultural or Paleontological Resources**

- a) The Subcontractor shall immediately report any evidence of unidentified cultural or paleontological resources unearthed during excavation to the LLNS Technical Representative. Subcontractor shall stop all work within 50 feet of the find until it has been assessed by LLNS and a notice to proceed is issued by the LLNS Technical Representative. LLNS will mark known cultural or paleontological resource areas by staking, fencing, and pink/black diagonally-stripped

flagging. The Subcontractor shall avoid these areas while performing the work.

Examples of cultural resources include:

- Prehistoric cultural deposits such as obsidian or chert flakes or tools; ground-stone mortars, slabs, or pestles; cultural deposits of shell or bone; beads, clothing or woven articles; locally darkened midden (trash) soils; and human interments.
- Historic-period cultural materials such as foundations or other structural remains; bottles, nails, barbed wire, ceramic pieces, buttons, weathered boards, and tin cans; refuse deposits; backfilled wells or privies; nails; glass and pottery.

Examples of paleontological resources include fossils and bones not of human origin.

- b) The Archaeological Resources Protection Act (ARPA) and the Antiquities Act regulate the protection and excavation of cultural or paleontological resources. The Subcontractor shall, under no circumstances, remove or disturb any such cultural or paleontological resources. If discovered, the Subcontractor shall leave in place, note their location, and immediately notify the LLNS Technical Representative.

(3) Protection of Biological Resources

Federally endangered and threatened animal and plant species, as well as State of California Species of Special Concern exist at LLNL sites. These resources require special protection and application of mitigation measures, depending on their location and the extent and location of the proposed subcontract work activity. Protection and management requirements and penalties for noncompliance are outlined in a series of federal and state laws. Before commencing work, preapproval must be obtained from an LLNL Biologist. Biological resources and special protection and mitigation measures are detailed below. The Subcontractor shall implement these measures when required under its Subcontract.

- a) Biological resources for consideration or that require conservation measures will be defined by LLNS.
- b) LLNS will instruct the subcontractor on how to protect wildlife from entrapment in steep-walled excavations greater than one foot deep as follows:
- Cover excavations completely at the end of each working day, or

- Provide excavations with animal escape ramps constructed of earth fill (greater than one foot) or wooden planks (greater than two feet). Earth ramps should be used for excavations between one and two feet in depth.
 - Before excavations are filled, thoroughly inspect them for trapped animals. Contact the LLNS Technical Representative to obtain the assistance of a LLNS wildlife biologist in freeing trapped animals.
- c) LLNS will determine if an LLNL Natural Resource Protection training is required prior to initiating work, the Subcontractor shall have all laborers, craftsman, supervisors, and managers directly involved in this project attend the training as required.
 - d) All workers shall ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash from the project area are deposited in covered closed trash containers that are not accessible by wildlife.
 - e) Feeding of any animals at any LLNL site is prohibited.
 - f) The Subcontractor will implement appropriate erosion control measures as identified by LLNS, e.g., native seeding and burlap straw waddles. No materials containing plastic monofilament, nylon net, plastic net, or photodegradable netting will be used at any LLNL site.
 - g) Subcontractors may not bring any animal to any LLNL site.
 - h) Exclusionary fencing will be required to surround the project site prior to start of work to preclude movement of animals into the project site as determined necessary by LLNS. Exclusionary fencing will consist of a silt fence that is at least 18 inches in height and held in place at the base by sand bags or trenched into the ground or equivalent structures. Exclusionary fence will be maintained until the project is complete.
 - i) LLNS will identify exclusion zones or other areas to avoid prior to start of work. Project activities will not violate exclusion zones or other areas demarcated by LLNS.
 - j) If any threatened or endangered species is discovered in the work area at any time, the Subcontractor shall immediately cease all work in that area and contact the LLNS Technical Representative before proceeding.

10. Work Requirements at Site 300

(a) Hazards

The LLNL Site 300 location is an area where explosives are processed, transported, and tested and the area shall be treated as a hazards area. All Subcontractor employees seeking access to Site 300 job sites for the first time under this Subcontract shall attend a 15-minute pre-job safety briefing at Site 300.

Site 300 also has a Valley Fever Hazard. The Valley Fever Hazard and the required training to perform work at Site 300 are described in the Indemnification and Insurance Requirements, "Site 300 Valley Fever Hazard."

(b) Additional Work Requirements

On all projects involving soil-disturbing activities, communicate the risk of Valley Fever and discuss the mitigation measures to protect those potentially affected.

Additional work requirements are detailed in the Security and Site Access Provisions.

11. Codes, Standards and Regulations

(a) The Subcontractor shall comply with the latest edition of the following codes and standards that are applicable to the hazards at its LLNL worksite:

California Code of Regulations

CCR Title 8, Chapter 4, Subchapter 7: General Industry Safety Orders
CCR Title 22, Sections 66261 and 66262

Code of Federal Regulations

10 CFR 835	Occupational Radiation Protection
10 CFR 850	Chronic Beryllium Disease Prevention Program
10 CFR 851	Worker Safety and Health Program
29 CFR 1904.4 - 1904.11, 1904.29 - 1904.33, 1904.44, and 1904.46:	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1910	Occupational Safety and Health Standards, excluding 29 CFR 1910.1096, Ionizing Radiation
29 CFR 1926	Safety and Health Regulations for Construction (Subpart CC – Cranes & Derricks in Construction and Subpart R – Steel Erection)
40 CFR 112	Oil Pollution Prevention

American Conference of Governmental Industrial Hygienists (ACGIH)

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices

American National Standards Institute (ANSI)

ANSI B30 Series	Safety Standards for Cranes and Hoists
ANSI Z87.1	Occupational and Educational Eye and Face Protection
ANSI Z88.2	American National Standard for Respiratory Protection
ANSI Z89.1	Personal Protection – Protective Headwear for Industrial Workers
ANSI Z136.1	Safe Use of Lasers
ANSI Z49.1	Safety in Welding, Cutting and Allied Processes, sections 4.3 and E4.3

American Society for Testing and Materials (ASTM International)

ASTM F 2413	Performance Requirements for Foot Protection
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Department of Energy Executive Orders

DOE O 435.1	Radioactive Waste Management
DOE O 442.1A	DOE Employee Concerns Program
DOE M 442.1-1	Differing Professional Opinions for Technical Issues Involving ES&H

National Fire Protection Association (NFPA)

NFPA 70	National Electrical Code
NFPA 70E	Standard for Electrical Safety in the Workplace

- (b) Nothing in this section shall be construed as relieving a Subcontractor from complying with all applicable federal, state, and local laws and regulations and any additional specific safety and health requirement that it determines to be necessary to protect the safety and health of workers.
- (c) Other codes or specifications may be cited elsewhere in the Subcontract documents and shall apply. The Subcontractor shall notify the LLNS Technical Representative, in writing, of any conflicts between the Subcontract specifications or drawings and the referenced codes, standards, and guides, and await instructions from LLNS before taking any related action. Where differences exist between codes and standards, the one with the most stringent requirement, as determined by the LLNS Technical Representative shall apply. Exceptions shall be limited to those cases where the Subcontractor has formally requested and been granted, in writing either an exemption or a finding of equivalency by LLNS.

12. Employees Concerns Program, Differing Professional Opinions

The Subcontractor shall comply with DOE O 442.1A, *DOE Employee Concerns Program* and DOE O 442.2, *Differing Professional Opinions for Technical Issues Involving ES&H*.

- (a) The Differing Professional Opinions (DPO) process encourages and facilitates dialogue and resolution on DPOs from Subcontractor employees regarding technical issues involving ES&H. It is not intended to circumvent other avenues for resolving technical disagreements but rather to supplement existing processes for assessing and

addressing technical issues related to ES&H. This process may highlight ES&H concerns, which may require LLNS to stop or curtail work operations, as necessary, to place the facility or activity in a safe condition until the DPO issue has been resolved.

- (b) LLNS has established a process for DPOs whereby Subcontractor employees, who believe they have knowledge of a significant technical issue related to ES&H at a DOE facility or activity that is not being properly addressed, should raise the issue in accordance with the following instructions to ensure it is properly considered in a timely manner. Subcontractor employees who submit DPOs are referred to as “submitters.”
- (c) Technical issues related to ES&H may be submitted to the attention of the LLNS Contract Analyst, the LLNS ES&H Team’s DPO manager (DPOM), or directly to the Department of Energy Laboratory Site Office (LSO). All submitters shall comply with the following:
 - (1) First seek resolution through available processes (e.g., discussions with first-line supervisors or through local DPO or review and comment processes.)
 - (2) If not resolved through available processes, submit a DPO to the applicable DPOM when it is believed that the technical issue can have a significant negative impact related to ES&H. All DPOs must be in writing and should include all required information (e.g., summary of position, including proposed or established practice; recommended action, assessment of consequences and technical basis for concern, recommend technical experts, provide relevant documentation for review, explain attempts to resolve issue prior to initiating DPO, identify NNSA facility and/or activity.) Additional information on the DPO process can be found at the following link:

<https://www.directives.doe.gov/directives/0442.2-BOrder/view>
 - (3) Submit written DPOs to:

DPO Manager, NNSA/LSO Chief of Staff,
NNSA – Livermore Site Office, L-293
7000 East Avenue / P.O. Box 808
Livermore, CA 94550 / 94551
 - (4) Meet with ad hoc panels and managers as requested and provide information as known to support a thorough review of the concern.
- (d) The Subcontractor shall inform its employees regarding their right and ability to report concerns on technical issues relating to ES&H through the DPO process.
- (e) The Subcontractor shall flow down the requirements of this clause to lower-tier subcontractors to the extent necessary to ensure the subcontractor’s compliance with the requirements and the safe performance of work.

13. Additional Recordkeeping and Reporting

In compliance with 29 CFR 1904.4 - 1904.11, 1904.29 - 1904.33, 1904.44, and 1904.46, Recording and Reporting Occupational Injuries and Illnesses, and in addition to the requirements identified in the Injury and Illness Reporting article included in the Subcontract, the Subcontractor shall:

- (a) Report all OSHA recordable injuries and any property damage to the LLNS Technical Representative immediately (within one hour of the incident);
- (b) Conduct an incident investigation and submit a complete written report to the LLNS Technical Representative within 24 hours of the incident;
- (c) If an injury is involved, provide a daily verbal and written update to the LLNS Technical Representative until the claimant is released to full duty and/or claim has been resolved; and
- (d) Not conceal or destroy any information concerning noncompliance or potential noncompliance with the requirements of this section.

14. Emergency Response and Medical Requirements

- (a) LLNL Health Services Department Services

The LLNL Health Services Department will provide emergency care (e.g., decontamination and treatment for radiological, biological, physical, or chemical agents) for ill or injured Subcontractor personnel at LLNL (Site 200) Monday through Friday, 8:00 a.m. to 4:45 p.m. LLNL's Site 300 has limited emergency care services available Monday through Thursday, 7:00 a.m. to 5:30 p.m.; however, Site 300 emergency care services do not address the breadth of treatments for injuries or illnesses available at LLNL's Site 200.

- (b) Medical Surveillance and Evaluations

The Subcontractor shall have an identified health care provider for appropriate preplacement, medical surveillance and fitness for duty evaluations for Subcontractor personnel as required by applicable laws, regulations, and orders. The Subcontractor shall comply with preplacement and medical surveillance requirements or any additional preplacement or medical surveillance standards identified by LLNS in this Subcontract for the specific work involved. The Subcontractor shall instruct the identified health care provider to provide immediate notification to the LLNL Health Services Department, at (925) 422-7459, in the event of work related health abnormalities found by a required examination.

(c) Emergency Notification

In case of an on-site medical emergency or an emergency affecting the safety of persons or property, the Subcontractor shall immediately call 911 from an LLNL system phone, or (925) 447-6880 (Emergency Dispatch Center) if calling from an off-site, pay, or cellular phone, and take appropriate action to prevent or minimize damage, injury, or loss. If at Site 300, where cellular phone coverage is limited, Subcontractors are encouraged to use LLNS issued radios to provide emergency notification.

The Subcontractor shall promptly notify the LLNS Technical Representative and the LLNS Contract Analyst, which notice may be oral followed by written confirmation, of the occurrence of such an emergency and the action taken by the Subcontractor.

(d) Occupational Medicine Services

The Subcontractor shall provide comprehensive occupational medicine services for its workers as necessary, in compliance with applicable laws and regulations. LLNS reserves the right to direct, and to review and approve, the specific occupational medicine services provided by the Subcontractor.

15. ES&H Performance Feedback

Upon LLNS' request, the Subcontractor shall provide feedback to the LLNS Technical Representative on the effectiveness of LLNS' ES&H requirements including, without limitation, those pertaining to on-site ES&H controls, notices, and oversight as well as LLNS-provided ES&H training and information. This feedback may include a self-assessment of the Subcontractor's performance relative to the ES&H requirements of this Subcontract.

(END OF ENVIRONMENT, SAFETY, AND HEALTH PROVISIONS)

(APPENDICES ON THE FOLLOWING PAGES)

APPENDIX A

CRANES, HOISTS AND RIGGING

Regulations

- A. Conduct hoisting and rigging activities in accordance with 29 CFR 1926 *Safety and Health Regulations for Construction Subpart CC – Cranes & Derricks in Construction and Subpart R Steel Erection. Plan and execute lifts of personnel, such as using a hoisting device or basket, in accordance with 29 CFR 1926.1431 and ASME B30.23.*

Applicability

- B. Hoisting and rigging activities include use of the following equipment or devices:
- Mobile cranes
 - Facility cranes
 - Forklifts with lifting attachments
 - Chain falls
 - Come-a-longs
 - Gantries
 - Industrial grade and/or rated: Jacks, Rollers, Dollies, Skates/skids, SPMT's (Self Propelled Modular Transporters), Pushers/ pullers)
 - Rigging equipment, such as slings, rigging hardware, below-the-hook lifting devices, etc.

LLNS Specific Requirements

In addition the following LLNS requirements apply to Subcontractors performing hoisting and rigging activities at LLNL.

- C. Personnel Training and Qualification. Provide personnel who rig loads, provide crane signal duties, and/or operate cranes or hoists that have experience and training on selection, inspection, hazards, operation, and use of hoisting and rigging equipment. Personnel must also have the following qualifications:
- Be 18 years of age or older.
 - Operator certification by the National Commission for Certification of Crane Operators (NCCCO) or other organization recognized by the U.S. Department of Labor.
 - Rigger/Signalman certification by the National Commission for Certification of Crane Operators (NCCCO) or other organization recognized by the U.S. Department of Labor.
- D. Equipment Inspection and Maintenance. Tag rigging equipment with capacity. Provide documentation upon request demonstrating that the equipment passed an annual inspection within 1 year from date of intended use, and passed a preoperational inspection prior to use. Store rigging properly (e.g., on racks or in protected areas). Inspect rigging in compliance with 29 CFR 1926.1400. Maintain inspection records at the project site.

- E. LLNS will classify lifts **during the site inspection** into one of the following categories: **simple, complex, or critical**. Provide input during the site inspection to LLNS as appropriate to determine the lift categories.

Simple lift. Lifts that are not categorized as complex or critical are simple lifts

Complex lift. Lifts where any of the following conditions are present:

- The load will be rotated or manipulated on or about its x or z axis.
- The load will be transferred (i.e. in mid-air from one crane to another).
- Any load where the center of gravity might move during the lift, such as a tank filled with liquid.

Critical lift. Lifts where any of the following conditions are met:

- Loss of control of the load being lifted would likely result in the declaration of an emergency.
- The load is unique and vital to a system, facility, or project operation, and would be irreplaceable or not repairable if damaged.
- If the load is damaged, the cost to replace or repair the load, or the delay in operations would have a negative impact on facility, organizational, or DOE budgets that would affect program commitments.
- If mishandling or dropping of the load would cause any of the above consequences to nearby installations and facilities.
- For steel erection, the lift exceeds 75 percent of the rated capacity of the crane or derrick, or requires the use of more than one mobile crane or derrick (refer to 29 CFR 1926.751).

F. Lift Plan Requirements

Submit lift plans for lifts (except simple lifts that are less than 2000-lbs). The Subcontractor may include multiple lifts at a construction location in a single lift plan.

Address the following in the lift plans:

- Designate personnel roles, as shown in the table below.
- Break the lifting activities down to the task level (staging, rigging, pre-lift, lift, and securement), using drawings and/or text.
- Characterize the load: weight, dimensions, center of gravity, rigidity, stability, and rigging attachment points. Verify undocumented attachment points by calculation to demonstrate adequacy.
- Define the work area:
 - Boundaries and access control
 - Travel path of the load
 - Start, staging, and finish points
 - Equipment, facilities, or structures that pose obstructions or impediments to moving/manipulating the load
 - Imposed loads on structures, utilities (above/below grade)
 - Weather considerations

- Identify the lifting and rigging equipment: type (use the categories in section B), capacities (load charts), physical size (length, width, height, physical compatibility), and rigging equipment (slings, rigging hardware, below-the-hook lifting devices).
- Describe securement of the load.
- Provide load path calculations (identify the forces that are effecting the rigging equipment).
- Provide mathematical calculations to demonstrate the load/object moves only due to forces and moments appropriately applied to start and stop desired motion.
- Demonstrate that equipment and components are within design constraints, and peripheral issues (ground bearing issues, crane mat calculations, and prohibited zones for power lines) are properly addressed.

Requirements and documentation for the different categories of lifts are shown in the table below:

	Lift Type:			
Requirement:	Simple <2000 lbs	Simple >2000 lbs	Complex	Critical
Documented Lift Plan	Not required.	Required.	Required.	Required.
Designation of Personnel Roles	Appoint a Designated Leader (DL); LLNS concurrence. Designate in lift plan, present at work site for entire lifting operation, may delegate or transfer. Communicate DL changes verbally.	Appoint a Designated Leader (DL); LLNS concurrence. Designate in lift plan, present at work site for entire lifting operation, may delegate or transfer. Communicate DL changes verbally.	Appoint a Designated Leader (DL); LLNS concurrence. Designate in lift plan, present at work site for entire lifting operation, may delegate or transfer. Communicate DL changes verbally.	Appoint a Person In Charge (PIC); LLNS concurrence. Designate in lift plan, present at work site for entire lifting operation, and cannot be delegated or transferred.
Inspections	Hoisting and rigging equipment shall meet ASME B30 requirements. Provide current certifications and inspection records. LLNS shall inspect and	Hoisting and rigging equipment shall meet ASME B30 requirements. Provide current certifications and inspection records. LLNS shall inspect and	Hoisting and rigging equipment shall meet ASME B30 requirements. Provide current certifications and inspection records. LLNS shall inspect and	Proof load test rigging equipment (slings, below-the-hook lifting devices, and rigging hardware) in accordance with applicable ASME

	Lift Type:			
Requirement:	Simple <2000 lbs	Simple >2000 lbs	Complex	Critical
	approve equipment upon arrival at LLNL. Request that the LLNS Technical Representative inspect set up and equipment prior to each lift.	approve equipment upon arrival at LLNL. Request that the LLNS Technical Representative inspect set up and equipment prior to each lift.	approve equipment upon arrival at LLNL. Request that the LLNS Technical Representative inspect set up and equipment prior to each lift.	standard. LLNS shall inspect and approve equipment upon arrival at LLNL. Request that the LLNS Technical Representative inspect set up and equipment prior to each lift.
Drawings			Scaled drawings required	Scaled drawings required
Pre-Lift Meeting			Required.	Required. Must be documented in lift plan.
Practice Lift				Required as specified by LLNS .
Post-Lift De-Brief		Required	Required.	Required.

Required Submittals

G. Submit the following information/documents to LLNS:

- Completed Lift Plan (may utilize template provided by LLNS)
 - Submit the lift plan(s) to LLNS for review and approval at least 3 business days prior to the commencement of the specific lift.
 - Include scaled drawings for complex and critical lifts

Note: Present deviations from an approved lift plan to the LLNS Technical Representative for approval prior to proceeding.

- Certification/Qualification documents for Crane Operators, Riggers and Signal Persons
 - Provide personnel qualifications five work days prior to the beginning of the work activity or upon arrival of the personnel at LLNL for approval by the LLNS Technical Representative.

- Age verification (i.e. employees are over 18 years of age) for all employees involved with cranes, hoisting and rigging
- Current crane certifications and inspection information
- ASME certifications and inspection records for the equipment used for hoisting and rigging
- ASME proof load test documentation for slings, below-the-hook lifting devices and rigging hardware used for critical lifts

(END OF APPENDIX A)

APPENDIX B

LLNL BEST MANAGEMENT PRACTICES (BMPS) FOR LAND DISTURBANCE LESS THAN 1 ACRE

This following document is to be used to ensure that LLNL non-industrial facilities and activities do not negatively impact storm water quality and receiving waters as required by the San Francisco Bay Region Municipal Regional Stormwater Permit Order No. R2-2009-0074 for the Livermore Site and the Phase II Small MS4 General Permit for Site 300. The portion of the MS4 permit that best describes the activities at Site 300 is Non-Traditional Small MS4 Permittees 40 CFR 122.26(b)(16). The Storm Water Pollution Prevention Plans for the Livermore Site and Site 300 document storm water requirements for the Industrial General Permit regulated portions of LLNL.

Appendix B outlines coverage for the non-industrial portions of LLNL sites, more specifically construction related activities where ground disturbance is less than one acre.

The effort is to prevent or reduce the discharge of pollutants to storm water from building repair, remodeling, construction, demolition and land disturbing activities by using sediment and erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using nonhazardous or less hazardous alternative products, and training employees. It is the responsibility of the Subcontractor to ensure that this approach is followed for all construction areas and phases of construction, including laydown and storage areas. Most of the BMPs discussed in this chapter are temporary in nature and are specific to construction and ground disturbing activities. Subcontractors performing work onsite shall be responsible for implementation of all BMPs. Where applicable, use BMPs identified in the most recent Stormwater Best Management Practice Handbook: Construction (CASQA). These BMPs include, but are not limited to:

- Use sediment control techniques when bare soil is temporarily exposed. See SE factsheet series in Stormwater Best Management Practice Handbook: Construction (CASQA).
- Use soil erosion control techniques when practical where bare ground is temporarily exposed. See EC factsheet series in Stormwater Best Management Practice Handbook: Construction (CASQA). Erosion control rolls, mats, or other similar materials containing monofilament, thin plastic thread or plastic netting may not be used at the project site.
- Use permanent soil erosion control techniques in areas where buildings are removed and not replaced (e.g., landscaping, hydroseeding, mulching, or graveling).
- Enclose painting operations, as appropriate, to be consistent with local air quality regulations and the Occupational Safety and Health Act (OSHA).
- Cover and properly store materials of particular concern (e.g., soil piles, chemical storage, paints) that are exposed to weather, especially during the rainy season. Subcontractor shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastics materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

- Properly store and dispose of waste materials generated from the activity. See Factsheet WM-5 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- Provide spill response training for personnel who handle hazardous materials. Subcontractor must notify LLNS of any spills.
- Maintain good housekeeping practices while work is underway, and remove debris in a timely manner.
- Prevent discharges of non-permitted wastewater to the storm water drainage system.
- Protect nearby storm drains to minimize the chance of inadvertent discharge of construction materials or sediment. See Factsheet SE-10 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- Designate an appropriate concrete wash out area for trucks. See Factsheet WM-8 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- Clean any sediment or debris from the storm water drainage system in the immediate vicinity of the construction activities after those activities are completed.
- Filter or settle sediment-laden runoff prior to discharge (avoid use of straw bales).
- Provide effective stabilization for all disturbed soils and other erodible areas prior to a forecasted storm.
- Maintain effective perimeter controls and stabilize all site entrances/exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. In the event that track out occurs, subcontractor shall be responsible for street sweeping as necessary. See Factsheet TC-2 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- Run-on and stormwater generated off site shall be diverted away from disturbed areas onsite.
- Implement effective wind erosion controls.
- Washing and cleaning of vehicles and equipment shall be in designated area and shall prevent pollutants from discharging into storm water. See Factsheet NS-08 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- If vehicle fueling is necessary onsite, it shall be done in designated location. Procedures and practices shall be designed to prevent fuel spills and leaks, and reduce and eliminate contamination of stormwater. See Factsheet NS-09 in Stormwater Best Management Practice Handbook: Construction (CASQA).

- If vehicle maintenance is necessary onsite, vehicle and equipment maintenance shall be in a designated area and shall prevent pollutants from discharging into storm water. See Factsheet NS-10 in Stormwater Best Management Practice Handbook: Construction (CASQA).
- Contain and clean up waste generated by grinding, drilling, sanding, sandblasting and scraping. Use a vacuum for fine particle clean-up. Dispose of wastes properly.

(END OF APPENDIX B)