

**Section 013529 – SAFETY AND HEALTH REQUIREMENTS****PART 1 – GENERAL****1.1 JEFFERSON LAB'S ES&H POLICY**

*Jefferson Lab considers no activity to be so urgent or important that we will compromise our standards for environmental protection, safety, or health (ES&H).*

**1.2 REFERENCES**

The publications listed below form a part of this specification to the extent referenced.

- A. 29 CFR 1926, "Safety and Health Regulations for Construction" (for construction work).
- B. 29 CFR 1904, "Recording and Reporting Occupational Injuries and Illnesses."
- C. 10 CFR 851, "Worker Safety and Health Program" (Department of Energy).
- D. 10 CFR 835, "Occupational Radiation Protection Program."
- E. NFPA 70E, "Standard for Electrical Safety in the Workplace" (2015).
- F. JSA/Jefferson Lab ES&H Manual. This document is available electronically through Jefferson Lab's homepage at <https://www.jlab.org/esh-manual>.
- G. 10 CFR 708, "DOE Contractor Employee Protection Program."
- H. American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" (2016).
- I. 29 CFR 1910, "Occupational Safety and Health Standards" (for service and maintenance work).

**1.3 DEFINITIONS**

- A. **Competent Person:** One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate the hazard.
- B. **Confined Space:** Any work area large enough to enter and perform work, has limited or restricted means of entry or egress, has limited natural ventilation, and is not designed for continuous occupancy.
- C. **Construction:** 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.
- D. **Construction Worksite:** The area within the limits necessary to perform the work described in this subcontract.
- E. **Critical Lift:** As defined by DOE-STD-1090-2007, "Hoisting and Rigging," Chapter 2 – "A lift shall be designated critical if any of the following conditions are met:
  - 1. The load item, if damaged or upset would result in a release into the environment of radioactive or hazardous material exceeding the established permissible environmental limits.
  - 2. The load item is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility or project operation.
  - 3. The cost to replace or repair the load item, or the delay in operations of having the load item damaged would have a negative impact on facility, organizational, or DOE budgets to the extent that it would affect program commitments.
  - 4. A lift not meeting the above criteria shall also be designated critical if mishandling or dropping of the load would cause any of the above noted consequences to nearby installations or facilities."
- F. **Imminent Danger:** A hazard which, if allowed to persist, is quite likely to cause an accident that will result in death, serious injury, significant property damage, or environmental impairment.
- G. **Permit-Required Confined Space:** A confined space that has one or more of the following characteristics:
  - 1. Contains or has a potential to contain a hazardous atmosphere,
  - 2. Contains a material that has the potential for engulfing an entrant,

3. Has an internal configuration that could cause an entrant to be entrapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section, or
  4. Contains any other recognized serious safety or health hazard.
- H. **Qualified Person:** One who, by possession of a recognized degree, certification, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work, or the project.
- I. **Qualified Person for Electrical Work:** One who has the skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.
- J. **Site-Specific Safety Plan (SSSP):** An official, binding document prepared by a subcontractor, bearing the signature of a responsible manager of the subcontracting company that defines the safety and health practices and responsibilities necessary to conduct operations on Jefferson Lab property in a safe manner. The plan will be project-specific.
- K. **Service & Maintenance:** Work not meeting the definition of construction work.
- L. **Safety Program:** Company policies and procedures to ensure operations comply with applicable safety and occupational health laws and regulations, and to protect the safety and health of employees and members of the public.
- M. **Stop-Work Order:** A definitive statement made openly to another individual that an imminent-danger situation exists and thus all related work must stop immediately.
- N. **Technical Representative (TR):** The individual or firm responsible to JSA, for the supervision and administration of the construction project to ensure the construction contractor's compliance with technical specifications and ES&H requirements; serves as the primary liaison between the subcontractor and Jefferson Lab. Any reference to TR within this subcontract shall be interpreted as the Construction Manager in 10 CFR 851.

#### 1.4 SUBMITTALS

- A. Site-Specific Safety Plan (SSSP)
- B. Activity Hazard Analysis (AHA)
- C. AHA Checklist
- D. Initial and Annual Certification of Subcontractor-Provided Training
- E. Safety Data Sheets (SDS)
- F. Tabulation of On-site Work Hours
- G. Incident Investigation Reports
- H. Lift Plans
- I. Fall Protection Plan
- J. Written Programs (if applicable) for Active Fall Protection and Lockout/Tagout Permits (as applicable)
- K. Laser Operational Safety Procedures (Class 3B, 3R, or 4 Laser)
- L. Permits (as applicable)
  1. PRCs (Permit-Required Confined Space)
  2. HW (Hot Work: Non-Electrical)
  3. Floor, Wall, & Ceiling Penetration
  4. EEWP (Energies Electrical)
  5. RWP (Radiation Work)
  6. DIG (Digging, Excavation, Trenching)

#### 1.5 GENERAL REQUIREMENTS

- A. In addition to the detailed requirements included in the provisions of this subcontract, construction work performed shall comply with OSHA 29 CFR 1926; and service or maintenance work performed shall comply with OSHA 29 CFR 1910. The Subcontractor shall take all reasonable precautions in the performance of the work under this subcontract to protect the safety and health of employees, of lower-tier subcontractors' employees, and of members of the public. During construction, all operations and personnel shall comply with all applicable safety and health regulations and requirements (including reporting requirements) of JSA and the Government.

Where the requirements of this specification, applicable regulations, and referenced documents vary, the most stringent requirements shall apply.

- B. No work shall commence on the construction worksite until Jefferson Lab approves the Subcontractor's Project Safety Plan, Activity Hazard Analysis (AHA), and the AHA Checklist.
- C. Stop-Work Actions and Interventions – In accordance with the Jefferson Lab ES&H Manual, every Jefferson Lab employee, subcontractor, scientific user, and DOE employee has the authority and responsibility to stop work for conditions that pose an imminent hazard or danger.
  - 1. The Subcontractor shall accept and respond immediately to directions from anyone to cease any activity or condition that is deemed unsafe. This applies to work by other subcontractors or by Jefferson Lab staff. Subcontractors shall immediately notify the TR or, if the TR is unavailable, contact 757-269-7400 anytime work is stopped under the above described conditions.
  - 2. In the event the Subcontractor fails to comply with applicable regulations or requirements, JSA may, without prejudice to any other legal or contractual rights, issue an order stopping all or any part of the work. Thereafter, a start order for resumption of the work may be issued at the discretion of JSA. The stopped work shall not recommence without a JSA resumption of work being issued.

## 1.6 SUBCONTRACTOR'S SAFETY PROGRAM

- A. The ultimate responsibility for compliance with all applicable federal, state, and local safety and health laws and regulations, and the requirements referenced herein, rests with the Subcontractor. It is the Subcontractor's responsibility to provide a safe and healthful place for carrying out the work on this subcontract.
  - 1. To ensure compliance with applicable regulations and project safety requirements, the Subcontractor and lower-tier subcontractors are subject to periodic scheduled and unscheduled inspections by the TR and/or Jefferson Lab ES&H professionals during the course of this subcontract.
  - 2. Failure of the Subcontractor or its subcontractors to comply with the referenced safety regulations contained herein will be considered a safety violation and will result in the action(s) listed below. There shall be no recourse by the Subcontractor for compensation due to lost time, claims for time extensions, or for excess costs or damages resulting from the initiation of these actions.
- B. For serious violations, which pose an immediate risk to life or property, an order will be issued to immediately stop part or all of the Subcontractor's work until compliance is achieved. For all other violations, the Procurement Officer or TR may issue a notice to the Subcontractor, stating the violation and the corrective action required. If the Subcontractor does not correct the violation within a stated abatement period, the following actions may be initiated:
  - 1. Subcontract payment retention may be held until the deficiency is corrected.
  - 2. An order may be issued to stop part or all of the Subcontractor's work until the deficiency is corrected.
  - 3. The Jefferson Lab Procurement Officer may make the necessary arrangements to correct the violation, and the cost thereof will be charged to the Subcontractor. Costs of such corrections may be retained and deducted from the final payment amount otherwise due the Subcontractor.
  - 4. Safety performance is considered for awarding future work.

## 1.7 SITE SAFETY AND HEALTH REPRESENTATIVE (SSHR)

- A. The Subcontractor shall have on the construction worksite a designated SSHR knowledgeable of the project's hazards, with full authority to act on behalf of the Subcontractor and lower-tier subcontractor employees regarding safety and health in accordance with 10 CFR 851. The SSHR shall be qualified by the following, at a minimum:

Type	Category	Description	Minimum SSHR & OSHA 10/30 Construction Requirements
Service	Level 0	Single Scope, Low Risk; and short duration	100% escort by JSA employee
Service	Level 1	Single Scope, Low Risk	None

Service	Level 2	Multi-Scope, Low Risk	SSHR; and OSHA 10-hr. Construction (current to 5 years) or OSHA 10-hr. General Industry (current to 5 years)
Service	Level 3	Multi-Scope, High Risk	SSHR; and OSHA 10-hr. Construction (current to 5 years) or OSHA 10-hr. General Industry (current to 5 years)
Construction	Level 4	Single Scope, Low Risk	SSHR; and OSHA 10-hr. Construction (current to 5 years)
Construction	Level 5	Multi-Scope, Low Risk; or Single Scope, High Risk	SSHR; and OSHA 30-hr. Construction (current to 5 years)
Construction	Level 6	Multi-Scope, High Risk	Full-Time SSHR; and OSHA 30-hr. Construction (current to 5 years) or CSP or 4-year degree in Occupational Safety

**B. Other SSHR requirements:**

1. The designated Site Safety and Health Representative shall make frequent and regular inspections of the construction worksite to identify and correct any instances of noncompliance with project safety and health requirements. These inspections shall detect and/or verify correction of hazardous conditions or hazardous work that impacts the Subcontractor and lower-tier subcontractor employees. The inspections and corrective actions shall be documented in writing. Submit these reports to the TR weekly.
2. No work shall be performed when the designated Site Safety and Health Representative or their alternate is not present on the construction worksite. Any approved alternate shall meet the same requirements as the Site Safety and Health Representative.
3. If the Site Safety and Health Representative does not have expertise/experience in a particular hazard, the Subcontractor shall provide such expertise that is readily available.
4. Site Safety and Health Representative duties include serving as contractor's coordinator for contractor personal registration and training verification.
5. SSHR, or the subcontractor's AHA preparer, shall walk down each project with the TR to develop the AHA Checklist prior to submitting the AHA, the AHA Checklist, and Site-Specific Safety Plan.

## **1.8 SITE-SPECIFIC SAFETY PLAN (SSSP)**

- A. In accordance with 10 CFR 851, the Subcontractor shall submit a written project Site-specific Safety Plan encompassing all pertinent aspects of the Subcontractor's Safety Program and addressing how the requirements of this specification section will be implemented. The Safety Program shall encompass the work of any and all lower-tier subcontractors involved in activities under this subcontract, and it shall include the Subcontractor's methods to enforce the elements of the Safety Program for all personnel on the construction worksite.
  1. Time for Submissions: Within twenty-one (21) calendar days after receipt of the subcontract award.
  2. Work at the construction worksite shall not commence until the Subcontractor's Safety Plan has been approved by the TR.
  3. Preliminary Safety Plan Meeting: The TR and Jefferson Lab ES&H professionals will meet with the Subcontractor to discuss the elements of the Subcontractor's Safety Program and the requirements of this section. To maximize the efficiency of the meeting, it is recommended that the Subcontractor have a draft of its Site-Specific Safety Plan.
- B. The Subcontractor's Site-Specific Safety Plan shall require the following, at a minimum:

Type	Category	Description	Minimum AHA & Site-Specific Safety Plan (SSSP) Construction Requirements
Service	Level 0	Single Scope, Low Risk; and short duration	100% escort by JSA employee
Service	Level 1	Single Scope, Low Risk	AHA, AHA Checklist
Service	Level 2	Multi-Scope, Low Risk	AHA, AHA Checklist, SSSP
Service	Level 3	Multi-Scope, High Risk	AHA, AHA Checklist, SSSP
Construction	Level 4	Single Scope, Low Risk	AHA, AHA Checklist, SSSP
Construction	Level 5	Multi-Scope, Low Risk; or Single-Scope, High Risk	AHA, AHA Checklist, SSSP
Construction	Level 6	Multi-Scope, High Risk	AHA, AHA Checklist, SSSP

1. A statement of the Subcontractor's commitment to provide a safe and healthful construction worksite for all employees, including subcontractors' employees and Jefferson Lab personnel.
  - a. Include a policy statement concerning substance abuse on the construction worksite.
  - b. A signature of a responsible manager of the subcontracting company.
  - c. A statement that all work will be in accordance with the Subcontractor's Site-specific Safety Program and that all employees have been briefed and trained on that program before beginning work.
2. Name, title and qualifications of the designated Site Safety and Health Representative and designated alternates.
  - a. Documented evidence of Off-Site Training for the Site Safety and Health Representative.
  - b. Description of the inspections performed by this individual (frequency and format for documentation of inspections).
3. A description of how the Subcontractor will provide pre-job daily discussions of planned work and hazards at the beginning of each work shift for all on-site subcontracted personnel.
4. Procedures for coordinating safety and health with lower-tier subcontractors and Jefferson Lab personnel on the construction worksite.
5. Procedures for communicating and coordinating safety and health requirements to non-English-speaking subcontractor personnel.
6. Preliminary assessment of hazards and a list of the Activity Hazard Analyses that will be performed for the project.
7. Description of Activity Hazard Analysis process, including:
  - a. How workers are informed of hazards and protective actions.
  - b. How workers will acknowledge being provided the information.
  - c. A disciplinary process for noncompliance with protective measures identified in the AHA.
  - d. How objective evidence (e.g., monitoring results) is to be used for establishing control measures, including exposure assessments to verify adequacy of control, if necessary as dictated by the hazards expected to be encountered.
8. Identify safety and health training requirements and procedures including, but not limited to:
  - a. New Worker Orientation shall occur prior to beginning work on the construction worksite.
  - b. Each worker acknowledging work hazards.
  - c. Frequency of toolbox safety meetings.
  - d. Updates or changes on safety practices relevant to the construction worksite, discussions on how corrective actions and lessons learned from incidents at the construction worksite and elsewhere will be incorporated into the project's Safety Program.
9. The Subcontractor's hazard communication program and the specifics for the construction worksite.

- a. Identification of the activities on the construction worksite that will require employees to be under an occupational medical or exposure-monitoring program. Upon Jefferson Lab's request, the Subcontractor shall submit documentation of compliance.
- b. Discussion of how medical personnel will be made available for advice and consultation on matters of occupational health.
- c. An emergency response plan that sets forth the procedures to be followed upon the occurrence of serious injuries, illnesses, fatalities, fires, structural failures, or other emergencies, including procedures for the administration of first aid and/or other necessary medical treatment including:
  - Identified provision for prompt medical treatment.
  - Process for reporting and investigating recordable injuries for possible cause and corrective action in accordance with 29 CFR 1904.
  - Specific designation of management persons responsible for review of injury and illness reports.
- d. Procedures for recording and reporting safety incidents and maintaining safety and health records in accordance with Occupational Safety and Health Administration (OSHA) requirements and in accordance with Jefferson Lab reporting requirements.
- e. Procedures for the investigation of job-related incidents to determine possible cause and corrective action. These procedures shall require Subcontractor participation in Jefferson Lab Accident Investigations.
- f. Specific designation of management persons responsible for review of injury and illness reports.
- g. Procedures for addressing extreme hot and cold weather conditions.

## 1.9 ACTIVITY HAZARD ANALYSIS

For each separately definable activity, the Subcontractor shall prepare an Activity Hazard Analysis (AHA) and an AHA Checklist identifying the foreseeable hazards and planned protective measures. Hazards expected on the project that are common to all activities are classified as conventional hazards. Both conventional and special hazards need to be addressed for each definable activity during the course of the project. Additional AHAs shall be required if the nature of work changes or there is a new work task. The Subcontractor shall retain on the construction worksite a copy of all AHAs and AHA Checklists for the duration of the contract.

- A. **Conventional Hazards:** The Subcontractor's Safety Plan may include the company's standard policies and practices for the following conventional hazards as they pertain to the project. The protective measures for these hazards must be followed by all workers on the construction worksite, including all lower-tier subcontractor personnel.

Storage & use of compressed gases	Concrete work
Confined space entry**	Excavation and trenching
Hand & power tools	Floor, roof, & wall openings
Construction worksite housekeeping	Ladders
Lockout/tagout	Material handling & storage
Construction rolling stock	Rigging & hoisting*
Thermal stress*	Welding, cutting, & grinding*
Scaffolds* & powered manlifts	

\*Procedures are to be aligned with Jefferson Lab's ES&H Manual.

\*\*Refer to Attachment B for program guidelines.

- B. **Special Hazards:** The AHA and AHA Checklists for Special Hazards shall be written specifically for the construction worksite conditions. These hazards include, but are not limited to, the following activities:
1. Work at heights >6 feet from ground level.
  2. Modifications to or installation of pressure vessels.
  3. Work on energized electrical equipment (See NFPA 70E section).
  4. Use of explosive-cartridge-actuated fastening systems.

5. Use of chemicals in a quantity or manner such that Safety Data Sheet (SDS) or other manufacturer information recommends use of special ventilation and/or respiratory protection.
  6. Confined-space entry.
  7. Excavations  $\geq 5$  feet in depth.
  8. Demolition of load-bearing walls.
  9. Steel erection.
  10. Use of flammable or toxic materials inside buildings.
  11. Solvent vapors from adhesives, paints, strippers, cleaning solvents, and spray coatings.
  12. Isocyanate vapors from spray-foam insulation and certain spray paints or coatings.
  13. Other activities in occupied buildings that present a risk to the Laboratory's personnel, equipment, or property.
  14. Silica exposure (cutting masonry products; installing, cutting, or removing concrete; installing or removing drywall compound, or dealing with other silica-containing products). Refer to Attachment A for recommended mitigations for typical silica tasks.
- C. AHAs shall define the tasks being performed, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable, lower level of risk.

The AHA and AHA Checklist format shall be as provided in the attached forms or an approved alternate.

1. The AHA and AHA Checklist shall document any special training, certification requirements, or Jefferson Lab permits, and shall identify by name the competent or qualified person(s) who will be responsible for the safe conduct of the activity. This includes documentation of CPR and first-aid training for all personnel performing work on energized electrical equipment.
2. When the AHA and AHA Checklist is approved by the TR, and prior to start of work, the Subcontractor shall brief employees involved in or affected by the work activity on the identified hazards and the mitigating measures specified. All briefed employees shall acknowledge briefings on hazards by signing or initialing the AHA and AHA Checklist activity.
3. The AHA and AHA Checklist shall be reviewed and modified as necessary to address changing site conditions, operations, or change of Competent/Qualified Person(s).
  - a. If more than one Competent/Qualified Person is used on the AHA and AHA Checklist activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and AHA Checklist and familiar with current site safety issues.
  - b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and AHA Checklist and is familiar with current site safety issues.
  - c. If work conditions for an activity change from the approved AHA, the activity shall stop until the AHA and AHA Checklist are updated to reflect the actual conditions and approved by the TR/SSHR. The revised AHA and AHA Checklist shall be briefed to affected individuals and re-signed showing their acknowledgement.

**D. Special Requirements for Fall Protection and Excavation Activities:**

1. Engineered systems for excavations (shoring and pre-manufactured shield/box systems) shall be designed by a registered professional engineer, and a copy of the design/approval information shall be included with the Activity Hazard Analysis.
2. Fall Protection Plan Requirement: When performing leading-edge work or during precast concrete erection where the employer can demonstrate that it is infeasible or it creates a greater hazard to use conventional fall-protection equipment, a Fall Protection Plan may be submitted for use. The Fall Protection Plan shall be prepared by qualified person (this also includes any changes), shall be developed specifically for the site, shall document why conventional fall protection systems are infeasible or why

they would create a greater hazard, and shall be implemented under the supervision of a Competent Person.

- E. **Jefferson Lab-Generated Hazard(s):** The Subcontractor is responsible for providing personal protection equipment (PPE) and hazard awareness training to all construction workers for identified hazard(s). Jefferson Lab-generated hazard(s) include:
1. Noise exposure.
  2. Oxygen deficiency.
  3. Radiation.

### 1.10 100% EYE, HEAD, AND FOOT PROTECTION

All construction workers and other personnel on the construction worksite shall wear at all times long pants and shirt sleeves to cover the shoulders, and eye, head, and foot protection that complies with applicable American National Standards Institute (ANSI) standards. The type of protective eyewear shall be selected as appropriate for the hazard. Gloves shall also be worn when handling chemicals or sharp objects. Welding and grinding requires a long-sleeve shirt with natural fibers. Qualified Electrical Workers (QEW) shall at a minimum wear Category 2 clothing, all-leather upper safety shoes conforming to ASTM International standards, and all-leather gloves.

### 1.11 OCCUPATIONAL HEALTH

The Subcontractor shall ensure the availability of medical personnel for advice and consultation on matters of occupational health.

- A. All workers shall be physically and medically qualified for performing the duties to which they are assigned.
- B. Exposure of workers to inhalation, ingestion, skin absorption, or contact with any material or substance in excess of acceptable limits specified in the American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices," or by OSHA, whichever is more stringent, is prohibited.
- C. The Subcontractor shall comply with all applicable standards and regulations to reduce contaminant concentration levels as low as is reasonably achievable.
  1. **Thermal Stress Hazards:** In situations where heat/cold stress may impact worker safety and health, the Subcontractor shall minimize the associated hazards with one of the following programs:
    - a. Company-established procedures as documented in the approved Site-Specific Safety Plan, or
    - b. Procedures documented in Jefferson Lab ES&H Manual Chapter 6670 – "Thermal Stress."
  2. **First Aid:** Jefferson Lab will provide first-aid telephone consultations for all workers on the construction worksite from 8 a.m. to 12 p.m. and 1 p.m. to 5 p.m. during normal business days. Minor first-aid injuries must be reported immediately to Jefferson Lab Occupational Medicine at 757-269-7539 or 757-269-5585.

### 1.12 JEFFERSON LAB PERMITS/PLANS AND INSPECTIONS

The Subcontractor must obtain a permit from Jefferson Lab to specifically authorize an activity to proceed under conditions recognized to be hazardous and requiring additional control. Permits will be issued based on approved Activity Hazard Analyses and completed permit application forms. Display the permits at the construction worksite during entire duration of the work activity. Not complying with the requirement for a permit may result in JSA stopping work and assessing a penalty. **No work shall commence on the construction site until Jefferson Lab acceptance of the necessary plans and permits to perform the planned work.**

- A. **Permit-Required Confined Space.**
- B. **Critical Lift:** Reference the definitions section.
- C. **Hot Work Permit (HWP):** All work activities that use welding, hot cutting, brazing, and abrasive grinding require an HWP (Hot Work Permit). Refer to ES&H Manual Chapter 6900, Appendix T1: "Hot Work Permit." Hot Work Permits are valid for no more than one month.
- D. **Laser:** Applies to Class 3B and Class 4 Lasers. Refer to ES&H Manual Chapter 6410.



- E. **Dig and Excavation Permit:** Required for any mechanized excavations or by hand-digging greater than 12 inches.
- F. **Blind Penetration Permit:** Required for any cutting or drilling penetrations into walls, ceilings, or floor.
- G. **Lift Plans:** Use of mobile cranes on-site, use of Jefferson Lab overhead cranes (if allowed under the contract), and suspended loads below a hook require submission of a lift plan for approval prior to work being performed as described in Section 1.15, “MATERIAL HANDLING AND MANLIFT EQUIPMENT,” of this document.
- H. **Construction Heavy Equipment Prior Approval:** Prior to use of construction equipment such as, but not limited to, backhoes, skid/steer loaders, pavers, excavators, powered industrial trucks, cranes, well drilling rigs, etc., Jefferson Lab Material Handling Staff will inspect the equipment for compliances with OSHA regulations.
- I. **Portable Equipment (not including hand tools) Prior Approval:** Prior to use, equipment such as, but not limited to, Class 3B and 4 lasers, XRF material testers, non-destructive weld testers, soil or pavement density compaction gauges (e.g., nuclear densometer), confined space rescue equipment, confined space atmospheric testers (e.g., 4 gas monitors), fall protection portable anchorages, etc., Jefferson Lab staff will inspect the equipment for compliance.
- J. **Daily Documented Inspections Conducted by Subcontractor:** Certain items shall be inspected daily and recorded on inspection checklists provided by the subcontractor. This list includes, but is not limited to: Excavations (for all depths  $\geq 4$  feet), and Construction Heavy Equipment.
- K. **Electrically Energized Work Permit:** This work is normally discouraged. If there are no safer methods, then the Lab’s permit system must be approved well in advance of the work.

### 1.13 SAFETY DATA SHEETS

The Subcontractor shall make available to all workers the Safety Data Sheet (SDS) for material brought or used on construction worksite. [Jefferson Lab may request a copy of the individual SDS for any product at any time.][For any material to be used in occupied spaces, submit a copy of the SDS to the TR before use of the material.]

### 1.14 WORK ON ELECTRICAL CIRCUITS AND SYSTEMS – (NFPA 70E)

- A. Work on electrical equipment, other than that which is infeasible to perform de-energized — such as voltage and current measurements — is not permitted at Jefferson Lab. Energized equipment shall be de-energized and locked and tagged out before work commences in the equipment enclosure.
- B. Work on electrical circuits and systems shall be performed in accordance with NFPA 70E. This includes all startup and commissioning activities.
- C. All work on electrical circuits and systems shall be performed by a Qualified Electrical Worker.
- D. The Qualified Electrical Worker shall verify zero voltage using a meter before any work is performed on de-energized equipment. Personal protective equipment in accordance with NFPA 70E shall be used until zero voltage has been verified. All electrical connections shall be inspected and approved by a qualified electrical worker prior to testing equipment and installing/reinstalling protective covers.
- E. Personal protective equipment (PPE) – non-melting inner and outer garments (per ASTM F1506-00) or untreated natural fibers is required as regular work attire. Additional protective clothing and protective gear shall be worn as specified in NFPA 70E table 130.7(C) (16), Personal Protective Equipment (PPE).

### 1.15 MATERIAL HANDLING AND MANLIFT EQUIPMENT

- A. Prior to use of material-handling equipment on the construction worksite, the Subcontractor shall ensure:
  - 1. The equipment meets the requirements of OSHA, American Society of Mechanical Engineers (ASME), and ANSI.
  - 2. Operators are trained and qualified to recognize the associated hazards.
  - 3. A Competent Person is designated and qualified to perform inspections as required by OSHA.
  - 4. OSHA-required documentation for all material-handling equipment must be available on-site to the TR upon request.
  - 5. Jefferson Lab Material Handling Staff have inspected the equipment and approved it for use. Notice must be made to the TR on the previous business day.

- B. Lift Plans:** Submit lift plans for each use of a mobile crane and when a forklift is used to raise a suspended load in accordance with ES&H Manual Chapter 6141, “Material Handling Equipment: Rigging, Cranes & Hoists.” The plan shall include the following, as applicable:
1. The plan shall specify the size and weight of the load to be lifted and all crane and rigging components that add to the weight.
  2. The plan shall specify the lift geometry and procedures, including the crane position, height of the lift, and the load radius. When using a mobile crane, include outrigger positions.
  3. The plan shall designate the Crane Operator, Lift Supervisor, Rigger, Signal Person, and Assembly/Disassembly Director and provide documentation for their qualifications as per OSHA 29 CFR 1926 Subpart CC, “Cranes and Derricks in Construction.”
  4. The plan shall include a rigging plan that shows the lift points and describes rigging procedures and hardware requirements (sling specifications, length, angles, shackle size, swivel eye hoist rings, etc.) and details for any below the hook lifting device.
  5. The plan shall describe the ground conditions, outrigger, or crawler track requirements, and, if necessary, the design of mats necessary to achieve a level, stable foundation of sufficient bearing capacity for the lift.
  6. The plan shall list environmental conditions under which lift operations are to be stopped.
  7. The plan shall specify coordination and communication requirements for the lift operation.
  8. The plan shall specify the lifting area perimeter where those not directly involved with the lift will be kept out.
  9. For lifts of personnel, the plan shall demonstrate compliance with the requirements of 29 CFR 1926, Subpart CC “Cranes and Derricks in Construction”.
  10. Every lift plan also requires an AHA and AHA Checklist.

#### 1.16 JEFFERSON LAB TRAINING REQUIREMENTS

**Subcontractor-Provided Training:** The Subcontractor is responsible for providing and maintaining records for all training required by OSHA, Federal, or state regulations. Examples are provided below. The contractor is responsible for submitting a letter, prior to commencing work on site and annually thereafter while working under this subcontract, certifying each of the workers has received the required training. Training is valid for no more than three years.

1. OSHA Confined Space
2. OSHA Fire Extinguisher
3. OSHA Equipment Operator Training (for type of equipment being used)
4. OSHA Ladder Safety
5. OSHA Scaffolding
6. OSHA Fall Protection
7. OSHA Respirable Crystalline Silica and OSHA Respirator
8. Excavation & Trenching
9. Lockout/Tagout
10. Rigging & Hoisting
11. Welding, Cutting, Grinding
12. Aerial Lifts
13. Scissor Lifts
14. NFPA 70E
15. CPR, First Aid, and Emergency Victim Release for electrical workers performing work on energized electrical systems 50 volts and over
16. ANSI Z136.1 Lasers

- A. Jefferson Lab-Provided Training:** Subcontractor personnel working at Jefferson Lab on this project are required to attend the following training prior to performance of any work on-site. The training is provided at no cost.

Course	Course Number	Approx. Duration	Required to Attend
ES&H Orientation for Construction Subcontractors; or ES&H Orientation for Service & Maintenance Subcontractors	SAF 100C; SAF100S	1 hour	All Personnel. Valid for 3 years.
Silica Dust Hazards in Construction	SAF138 or approved equivalent	1 hour	Personnel cutting masonry products; installing, cutting, or removing concrete; installing or removing drywall compound, or dealing with other silica-containing products.
General Employee Radiological Training – GERT	SAF 800	2 hours	All personnel working within the Accelerator Site, certain areas in the existing Test Lab and EEL buildings. Any personnel utilizing Radioactive Source Testing Devices. Valid for 2 years.
Radiation Worker I	SAF 801	8 hours	All personnel working in accelerator enclosures (tunnels/halls) and other Radiologically Controlled Areas. Valid for 2 years.
Oxygen Deficiency Hazards – ODH	SAF 103	2 hours	All personnel working in ODH areas. Valid for 2 years.
Spill Prevention Control & Countermeasure Plan	SAF 123	0.3 hour	Personnel working with oil products
Annual Security Awareness	GEN 034	0.5 hour	Personnel with access to master keys or electronic key boxes
Activity Hazard Analysis Preparation	GEN133	1 hour	Individuals preparing an AHA and AHA Checklist, plus the site safety and health representative.
Hall A Worker-Awareness Training	SAF 110	1 hour	Individuals performing work in Hall A.
Hall B Worker-Awareness Training	SAF 111	1 hour	Individuals performing work in Hall B.
Hall C Worker-Awareness Training	SAF 112	1 hour	Individuals performing work in Hall C.
Hall D Worker-Awareness Training	SAF 113	0.5 hour	Individuals performing work in Hall D.
Tunnel Worker Safety Orientation	SAF 132	1.5 hours	Individuals performing work in accelerator tunnel.
Site Safety & Health Representative Responsibilities	SAF 199	0.5 hour	All Subcontractor Site Safety & Health Representatives and their Alternates. Valid for 3 years.

**B. Radiological Training:**

1. General Employee Radiological Training (GERT) is required for all personnel working within the Accelerator Site and in designated areas. GERT informs the employee of basic radiation protection concepts and the Radiological Control Program established at JSA/Jefferson Lab.
  2. Radiation Worker training is required for personnel needing unescorted access to radiologically controlled areas, and personnel handling or working with radioactive materials.
  3. Radiation Worker Training also fulfills the GERT training requirement for an individual.
- C. Oxygen Deficiency Hazards:** Some work areas at Jefferson Lab store and/or use compressed gasses, liquefied gasses, and volatile liquids. The uncontrolled release of these gasses and liquids could lead to a reduction in the amount of available oxygen in the work area. Potential oxygen deficiency hazards (ODH) exist in [specify the facilities/areas that ODH exists]. [When work is performed in these areas, Subcontractor personnel shall work in pairs, with one worker in each pair carrying an oxygen detector. Members of working pairs shall work within 15 feet of each other.]
- D. Lockout/Tagout Training:** If the Subcontractor has their own Lockout/Tagout program, they may submit it to Jefferson Lab for review and approval. If approved by Jefferson Lab's ES&H Division, workers covered by the program shall be exempt from Jefferson Lab Lockout/Tagout Training. In general, Jefferson Lab does not permit "tagout-only" as an approved energy control process.
- E. Electrical Training:** Workers performing work on energized electrical systems 50 volts and over shall have Safety Training to include lockout/tagout and NFPA70E. Electrical workers shall also have CPR and First Aid training and Emergency Victim Release training.
- F. Access Escort in Lieu of Training:** Visitors to Jefferson Lab or escorted personnel are escorted continuously by an individual who is qualified, trained, and authorized to enter the area(s) being visited. A "visitor" is anyone who is not authorized to access an area without an escort. The visitor is an individual who has not completed the requisite ES&H training. An "escort" must have the appropriate training and authorization to enter the area(s) being visited. Subcontract employees are allowed to provide escort services for deliveries of material only. Escorted personnel shall not perform any work not related to deliveries. Non-Lab owned equipment must be inspected and accepted by the Lab Material Handling Department. Escorted personnel shall remain in sight of the escort at all times. Escorts shall ensure that a safety briefing has been provided to the visitor, which includes the basic safety information and any additional information relevant to the hazard issues to be encountered on-site.

**1.17 SAFETY PENALTIES**

- A.** In addition to the other safety provisions of this Subcontract, financial penalties will be utilized to reinforce compliance with those safety provisions and to reduce the frequency of safety violations and accidents. The determinations regarding assessment of the fines may be made unilaterally by Jefferson Lab/JSA and are not subject to the Disputes clause.
- B. Fines for Safety Violation:** Monetary penalties may be assessed to the Subcontractor when violations are found based on magnitude of the associated risk.
1. **Assessment of Fines:** When a violation is noted, a determination will be made as to the risk posed by the deficiency. The amount of the fine increases with risk. The time allowed for abating a deficiency decreases with increasing risk. Imminent dangers are stop-work situations, and immediate mitigation is required. The Procurement Officer, TR, or their authorized representatives can assess fines.
  2. **Payment of Fines:** These fines will be assessed to the Subcontractor by a modification to the subcontract regardless of whether the safety violations were directly caused by the Subcontractor or were caused by a lower-tier subcontractor.
  3. **Amount of Work Activity and Fines:** Fines for safety violations may be assessed during all months when work is performed on construction worksite, regardless of the value of work that is performed during that monthly period.
  4. **Correction of Violations:** Assessment of fines for any safety violation does not relieve the Subcontractor from its responsibility for correcting the safety violation in a time period that is consistent with the seriousness of the violation.

5. **Posting of Violations:** The Subcontractor shall post these safety violations and associated fines at the construction worksite in a prominent location.

## **PART 2 – PRODUCTS: NOT USED**

## **PART 3 – EXECUTION**

### **3.1 REPORTING REQUIREMENTS**

- A. In addition to the reporting and recordkeeping requirements of OSHA 1904, the Subcontractor shall submit to the Subcontracting Officer original forms of the reports as described below.
1. Each report shall be timely, accurate, legible, and complete with respect to all work performed within the scope of this subcontract – including administrative and subcontracted work. Failure to comply for any reason shall be considered just cause either for issuance of an order to stop all or any part of the work covered by this subcontract and/or the retention of funds in payment for such work.
- B. **Incidents:** The following incidents shall be reported by the Site Safety and Health Representative by telephone to the TR, required immediately, then in writing and submitted to the TR no later than 24 hours: If you cannot contact the TR, call 757-269-7400 to report the incident.
1. Fatalities or injuries (other than first aid) regardless of the circumstances,
  2. Unplanned Operational Emergencies, Shutdowns, or Evacuations, for any reason,
  3. All Stop-Work Orders, whether Jefferson Lab, subcontractor or Thomas Jefferson Site Office (TJSO) initiated,
  4. Fires or explosions of any type or severity,
  5. Electrical shocks of any severity, regardless of circumstances,
  6. Any type of Lockout/Tagout violation,
  7. Abnormal release or loss of control of hazardous materials,
  8. Any type of unauthorized entry into a Jefferson Lab restricted area,
  9. Property damage, including unexpected discovery or damage of any type of utility, regardless of energy status,
  10. Unexpected discovery of hazardous energy, including pressurized or electrical systems,
  11. Discovery of suspect or counterfeit material,
  12. Environmental damage or releases of any severity, including those events that occur as a result of offsite transportation,
  13. Any DOE or regulatory body-initiated noncompliance notification,
  14. Any management concern item where the information is deemed valuable for others, either at Jefferson Lab or the DOE complex, or
  15. Any item or activity which Jefferson Lab Management directs to be investigated.
- C. The Subcontractor shall provide to the TR updated information at least weekly concerning the lost or restricted workdays status of any Subcontractor employee injured at Jefferson Lab. These updates shall continue until the attending physician has cleared the employee for resumption of unrestricted work.
- D. Report first-aid cases to the TR – no investigation required.
- E. “Tabulation of On-Site Work Hours
- F. The Subcontractor shall provide to the TR documented evidence of a Daily Pre-Job Safety Brief.

### **3.2 CONCERN REPORTING PROCESS**

- A. **Whistleblower Protection for Subcontractor Employees:**
1. The Subcontractor shall comply with the requirements of the “DOE Contractor Employee Protection Program” at 10 CFR Part 708.
  2. The Subcontractor shall insert or have inserted the substance of this clause, including this paragraph (b), in lower-tier subcontracts, at all tiers, with respect to work performed on any construction worksite at a DOE-owned or leased facility, as provided for at 10 CFR Part 708.
- B. **Concern Reporting Processes:** Subcontractor employees on the construction worksite are entitled to use any of the means available to communicate concerns about ES&H conditions and practices. Information about

concern reporting is available on ES&H bulletin boards throughout Jefferson Lab, and shall be included with Jefferson Lab-provided materials for the construction worksite postings for this project. The options for reporting concerns include:

1. Jefferson Lab Concern Reporting Process
2. DOE Concern Reporting Processes

### **3.3 LOWER-TIER SUBCONTRACTOR COMPLIANCE**

- A. In all lower-tier subcontracts involving performance of work at the construction worksite, the Subcontractor shall include the provisions of lower-tier subcontractor compliance. However, such provisions in the subcontracts shall not relieve the Subcontractor of its obligations to assure compliance with the provisions of this clause for all aspects of the work.

### **3.4 PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS**

- A. Individual occupational radiation exposure records generated in the performance of work under this subcontract shall be subject to inspection by DOE and shall be preserved by JSA until disposal is authorized by DOE or, at the option of JSA, delivered to DOE upon completion or termination of the subcontract. If JSA exercises the foregoing option, title to such records shall rest in DOE upon delivery.

**END OF SECTION 013529**

Activity Hazard Analysis (AHA) CHECKLIST		Project Name:	Task:
Hazards	Controls	PPE	Permits
<input type="checkbox"/> Manual Lifting	<input type="checkbox"/> Warm up <input type="checkbox"/> Lift object: close to body, avoid twisting, use legs, face the load <input type="checkbox"/> < 40 lb./person <input type="checkbox"/> Team Lift	<input type="checkbox"/> Select	
<input type="checkbox"/> Overhead Utility Pole Wire	<input type="checkbox"/> Vehicles > 20 ft. (truck, aerial/scissor lift, crane) from overhead electric lines	<input type="checkbox"/> Select	<input type="checkbox"/> EEWP
<input type="checkbox"/> Electric Power	<input type="checkbox"/> Barricade <input type="checkbox"/> Determine all outputs <input type="checkbox"/> Circuits de-energized <input type="checkbox"/> 2-person rule if > 50V <input type="checkbox"/> Verify de-energized with AC voltage detector <input type="checkbox"/> Re-energization plan in place <input type="checkbox"/> Shock boundaries <input type="checkbox"/> Attendants	<input type="checkbox"/> Select	<input type="checkbox"/> EEWP
<input type="checkbox"/> Hoist or Overhead Crane	<input type="checkbox"/> Signal person <input type="checkbox"/> Tag lines <input type="checkbox"/> Barricaded <input type="checkbox"/> Crane & connections inspected	<input type="checkbox"/> Select	
<input type="checkbox"/> Mobile Crane	<input type="checkbox"/> Signal person <input type="checkbox"/> Tag lines <input type="checkbox"/> Barricaded <input type="checkbox"/> Crane & connections inspected	<input type="checkbox"/> Select	<input type="checkbox"/> LIFT
<input type="checkbox"/> Forklift	<input type="checkbox"/> Pre-use inspected <input type="checkbox"/> Safe speed <input type="checkbox"/> Secure load <input type="checkbox"/> Spotter <input type="checkbox"/> Use horn <input type="checkbox"/> Reverse driving if front view blocked <input type="checkbox"/> Seatbelt <input type="checkbox"/> On grades, tilt load back	<input type="checkbox"/> Select	<input type="checkbox"/> LIFT (When using attachments)
<input type="checkbox"/> Trench/Dig/ Excavate	<input type="checkbox"/> Utilities & Safe dig zone identified <input type="checkbox"/> If > 5 ft. depth: shore, slope, or shield <input type="checkbox"/> If > 4 ft. depth: Egress every 25 ft., Ventilate & 4-Gas Testing	<input type="checkbox"/> Select	<input type="checkbox"/> DIG
<input type="checkbox"/> Floor/Wall/Ceiling	<input type="checkbox"/> Utilities & Safe penetration zone identified in Floor, Wall, or Ceiling <input type="checkbox"/> Drill stops		<input type="checkbox"/> PENETRATION
<input type="checkbox"/> Weld/Cut/Braze/Grind	<input type="checkbox"/> Fire Watch with fire extinguisher <input type="checkbox"/> Flammables & combustibles removed <input type="checkbox"/> Flammable & combustibles covered <input type="checkbox"/> Welding screens <input type="checkbox"/> GFCI <input type="checkbox"/> Ventilation	<input type="checkbox"/> Select	<input type="checkbox"/> HW
<input type="checkbox"/> Vehicle Traffic	<input type="checkbox"/> Cones <input type="checkbox"/> Barricaded & Signs <input type="checkbox"/> Traffic Flagman <input type="checkbox"/> Signalman <input type="checkbox"/> High-Vis Vest	<input type="checkbox"/> Select	
<input type="checkbox"/> Hand & Power Tool, Cord	<input type="checkbox"/> GFCI <input type="checkbox"/> Pre-use inspected <input type="checkbox"/> Guarded <input type="checkbox"/> No electric tools in wet locations	<input type="checkbox"/> Select	
<input type="checkbox"/> Ladder (portable & fixed)	<input type="checkbox"/> Pre-use inspected <input type="checkbox"/> Climb no tools in hands <input type="checkbox"/> Rated Type I <input type="checkbox"/> No over reach <input type="checkbox"/> 4:1 angle <input type="checkbox"/> Ladder tied off/held <input type="checkbox"/> 3 points of contact <input type="checkbox"/> No stand top steps	<input type="checkbox"/> Select	
<input type="checkbox"/> Scaffold	<input type="checkbox"/> Pre-use inspected <input type="checkbox"/> Tags current <input type="checkbox"/> Footings solid <input type="checkbox"/> Secured to structure <input type="checkbox"/> Guardrails & toe-boards used <input type="checkbox"/> Ladder installed & secured <input type="checkbox"/> Gates	<input type="checkbox"/> Select	
<input type="checkbox"/> Overhead Object Dropped	<input type="checkbox"/> Toe-board, screen, debris net <input type="checkbox"/> Tools tethered <input type="checkbox"/> Scrap chutes <input type="checkbox"/> Barricade	<input type="checkbox"/> Select	
<input type="checkbox"/> Scissor Lift & Aerial/MEWP	<input type="checkbox"/> Pre-use inspect <input type="checkbox"/> Firm surface <input type="checkbox"/> Work inside guardrail <input type="checkbox"/> Spotter <input type="checkbox"/> Barricade	<input type="checkbox"/> Select	
<input type="checkbox"/> Slip, Trip or Fall	<input type="checkbox"/> Housekeeping <input type="checkbox"/> Hoses/cords organized <input type="checkbox"/> Spills prevented <input type="checkbox"/> Hole cover	<input type="checkbox"/> Select	
<input type="checkbox"/> Line-Of-Fire	<input type="checkbox"/> Tool guards <input type="checkbox"/> Line-of-Fire clearance area <input type="checkbox"/> Barricades	<input type="checkbox"/> Select	
<input type="checkbox"/> Compressed Gas Cylinders	<input type="checkbox"/> Pre-use inspected <input type="checkbox"/> Secured & upright <input type="checkbox"/> Oil & grease-free cylinders <input type="checkbox"/> Oxygen & fuel cylinders secured on welding cart or separated by 20 ft. or fire-rated wall	<input type="checkbox"/> Select	
<input type="checkbox"/> Very Hot or Cold Weather	<input type="checkbox"/> Water breaks <input type="checkbox"/> Rest breaks <input type="checkbox"/> Shade <input type="checkbox"/> Worker rotation <input type="checkbox"/> Layered clothing	<input type="checkbox"/> Select	
<input type="checkbox"/> Severe Weather	<input type="checkbox"/> Frequent weather forecast checks <input type="checkbox"/> Stop work if high winds, storms, lightning	<input type="checkbox"/> Select	
<input type="checkbox"/> Environmental (air/waste/water)	<input type="checkbox"/> Spill prevention <input type="checkbox"/> Sanitary drains covered <input type="checkbox"/> Stormwater runoff barriers <input type="checkbox"/> Hazardous waste containers coordinated with Jlab Environmental	<input type="checkbox"/> Select	
<input type="checkbox"/> Adjacent Work Hazards	<input type="checkbox"/> Barricades <input type="checkbox"/> Identify workers adjacent, above or below <input type="checkbox"/> Coordinated with adjacent supervisor, foreman, customer, operator	<input type="checkbox"/> Select	
<input type="checkbox"/> Pinch Points	<input type="checkbox"/> Guards <input type="checkbox"/> Hands/face/body/feet kept clear of line-of-fire <input type="checkbox"/> Cover sharp edges	<input type="checkbox"/> Select	
<input type="checkbox"/> Entering Barricaded Area	<input type="checkbox"/> Barricade (SIGN explaining purpose of barricade required for all barricades)	<input type="checkbox"/> Select	
<input type="checkbox"/> Noisy Portable Equipment	<input type="checkbox"/> If >85 decibels, "Hearing PPE Required" signs posted <input type="checkbox"/> Dual PPE if > 100 dBA	<input type="checkbox"/> Select	
<input type="checkbox"/> Chemical Use (IH approval)	<input type="checkbox"/> Reviewed SDS <input type="checkbox"/> Exposure air monitoring <input type="checkbox"/> Containers labeled <input type="checkbox"/> Ventilation <input type="checkbox"/> Containers large enough & compatible to chemical <input type="checkbox"/> Spill containment	<input type="checkbox"/> Select	<input type="checkbox"/> PRCS
<input type="checkbox"/> Silica Dust (IH approval)	<input type="checkbox"/> Cut/drill/grind concrete & brick manually without power tools <input type="checkbox"/> Wet methods <input type="checkbox"/> Power tools use HEPA vacuum or water spray <input type="checkbox"/> Barricades <input type="checkbox"/> IH approval	<input type="checkbox"/> Select	
<input type="checkbox"/> Oxygen Deficiency Hazard (ODH Areas 0/1/2/3/4)	<input type="checkbox"/> Prevent escape of compressed gasses or fire suppression chemicals <input type="checkbox"/> Buddy system for ODH 1,2,3, or 4 areas <input type="checkbox"/> Respirator for ODH 2,3, or 4 areas	<input type="checkbox"/> Select	
<input type="checkbox"/> Cryogenic	<input type="checkbox"/> Identify work with helium, nitrogen, argon, hydrogen, oxygen gasses	<input type="checkbox"/> Select	
<input type="checkbox"/> Asbestos, Lead, Beryllium	<input type="checkbox"/> Industrial Hygiene approval if disturbing (cut, drill, grind, remove) <input type="checkbox"/> VA License	<input type="checkbox"/> Select	
<input type="checkbox"/> Non-ionizing Radiation	<input type="checkbox"/> Industrial Hygiene approval for work with either lasers, magnetic fields, or RF	<input type="checkbox"/> Select	
<input type="checkbox"/> Drill/Cut in (RCA) Ionizing Radiation Controlled Areas	<input type="checkbox"/> RadCon approval <input type="checkbox"/> Dosimeter <input type="checkbox"/> SRPD Dosimeter <input type="checkbox"/> Barricades	<input type="checkbox"/> Select	<input type="checkbox"/> RWP
<input type="checkbox"/> Respirator Use	<input type="checkbox"/> Industrial Hygiene approval of work plan	<input type="checkbox"/> Select	
<input type="checkbox"/> Body Harness / Lanyard Use	<input type="checkbox"/> TR approval of subcontractor work plan <input type="checkbox"/> Supervisor approval of FML work plan	<input type="checkbox"/> Select	<input type="checkbox"/> FALL

## PERMITS

PRCS (Permit-Required Confined Space) / LIFT (Critical Lift) / HW (Hot Work Non-Electrical) / LASER (Laser) / PENETRATION EEWP (Energized Electrical) / FALL (Fall Protection) / RWP (Radiation Work) / DIG (Digging, Excavation, Trenching) / ASBESTOS / LEAD
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## PPE to Select (\* = Always Required)

General PPE	Eyes & Face	Hands	Fall Protection
<input type="checkbox"/> *Hard Hat (Not always for FM&L)	<input type="checkbox"/> *Safety Glasses	<input type="checkbox"/> Cut Resistant Gloves	<input type="checkbox"/> Full Body Harness
<input type="checkbox"/> Hearing Protection	<input type="checkbox"/> Face Shield	<input type="checkbox"/> Welders Leather Gloves	<input type="checkbox"/> Lanyard or Self-Retracting Lanyard
<input type="checkbox"/> Double Hearing Protection	<input type="checkbox"/> Chemical/Dust/Burning Goggles	<input type="checkbox"/> Chemical Compatible Gloves	<input type="checkbox"/> Anchorage Connector
<input type="checkbox"/> Hi-vis Vest, Jacket or Shirt	<input type="checkbox"/> Welding Hood	<input type="checkbox"/> Surgical Gloves	<input type="checkbox"/> Horizontal Life Line System
<input type="checkbox"/> *Long Pants		<input type="checkbox"/> Arm Sleeves	<input type="checkbox"/> Stanchions & Flags
<b>Respiratory</b>	<b>Feet</b>	<b>Special Clothing</b>	<b>Arc Flash</b>
<input type="checkbox"/> Dust Mask	<input type="checkbox"/> *Safety Toe Shoes	<input type="checkbox"/> Tyvek Coveralls	<input type="checkbox"/> Category 1
<input type="checkbox"/> Air Purifying (¼, full, PAPR)	<input type="checkbox"/> Rubber Boots	<input type="checkbox"/> Fire Retardant Clothing	<input type="checkbox"/> Category 2
<input type="checkbox"/> Air Supplied (SCBA or Airline)	<input type="checkbox"/> Metatarsal Protection	<input type="checkbox"/> Chemical Apron	<input type="checkbox"/> Category 3
<input type="checkbox"/> Emergency Escape			<input type="checkbox"/> Category 4

From: Date: 08/16/22

## Activity Hazard Analysis (AHA)

<b>Created By</b>	<b>Date</b>	<b>TR/CM Approval</b>	<b>Date</b>
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**Required Permits and Plans**

☐ Hot Work
 ☐ Confined Space
 ☐ Dig/Blind Penetration
 ☐ Lift Plan
 ☐ Outage

**Required Jlab Training**

All workers: SAF100C or SAF100S

SSHR & Alternate: SAF199

Additional Jefferson Lab Training (list):

**Alternative Competent Person / SSHR**

Step	Description	Hazard	Control Measures
1	Pre-Job Briefing (PJB)	None	Conduct a PJB with the TR/CM before the job begins.
2	Toolbox Talk	None	Before each work shift, conduct a toolbox talk with all involved employees. Discuss the task(s) to be performed for the work shift and any associated hazards.

**Task-Specific Training and/or Certifications Required**

Step(s)	Required Training/Certification	Step(s)	Required Training/Certification







## AHA Checklist & AHA Signature Sheet

**I have been briefed on the hazards and control measures that are in place for this task as listed on the AHA Checklist and AHA. I also acknowledge that if conditions change or new hazards are discovered, I shall stop, place the work in a safe condition, and contact the Competent Person / SSHR.**

[illegible]

## ATTACHMENT A: GUIDANCE FOR SILICA WORK

Typical Jefferson Lab Silica Work*	Duration/ Scope per 8-hour shift	General Location	Required Controls**	Notes
Grout/Mortar/Cement Mixing	≤5 sq. ft. / ≤7 bags	Indoors/Outdoors	B, D	Keep employees upwind of dust when outdoors.  Wet bags with water prior to opening, continue to mist when mixing until thoroughly wetted (no visible dust).
Grout/Mortar Mixing	>5 sq. ft. / >7 bags	Indoors/Outdoors	A, C, D	Where feasible, order and use pre-mixed grout, concrete, or mortar to eliminate silica hazard.  Wet bags with water prior to opening, continue to mist when mixing until thoroughly wetted (no visible dust).
Shoveling Sand	Any	Outside	B	Keep employee upwind of dust when outdoors.
Handheld and Stand-Mounted Drills	< 4 holes	Outdoors	B	Use HEPA vacuum or wet-methods for housekeeping (no dry sweeping).
	< 4 holes	Indoors	A* or B	*use HEPA vacuum at the point of operation when drilling overhead.
	≥ 4 holes	Indoors/Outdoors	A	
Saw Cutting – Chop Saw/Stationary Saw	< 4 hours	Outdoors	B, D	Saw must be equipped with integrated water delivery system that continuously feeds water to the blade.  (misting with hand water sprayer is not adequate)
	> 4 hours	Outdoors	B, C, D	
Saw Cutting – Handheld Power Saw	<1 linear ft.	Outdoors	B, D	
	>1 linear ft.	Outdoors	B, C, D	
Saw Cutting – Walk-Behind Saw	< 4 hours	Outdoors	B, D	 
	> 4 hours	Outdoors	B, C, D	
	< 1 hour	Indoors	B, D	
	> 1 hour	Indoors	B, C, D	Increase respiratory protection to full-face respirator or Powered Air Purifying Respirator.
	> 4 hours	Indoors	B, C, D	
Floor Surface Grinder	< 4 hours	Indoors/Outdoors	A or B, C, D	

Typical Jefferson Lab Silica Work*	Duration/Scope per 8-hour shift	General Location	Required Controls**	Notes
	> 4 hours	Indoors	A, C, D	Increase respiratory protection to full-face respirator or Powered Air Purifying Respirator.
	> 4 hours	Outdoors	A or B, C, D	Increase respiratory protection to full-face respirator or Powered Air Purifying Respirator.
Drywall/Sheetrock Sizing (score & snap, hand saw, rotary cutter)	Any	Indoors/Outdoors		Use HEPA vacuum for housekeeping (no dry sweeping).
Joint Compound Sanding	>1 linear ft.	Indoors/Outdoors	A, C, D	Low-dust joint compounds are available (e.g., USG Sheetrock Brand Dust Control Joint Compound).
Tuck Pointing/Grout Repair - Hand Tools	Any	Indoors/Outdoors	B, D	Water must be combined with a surfactant.
Tuck Pointing/Grout Repair - Power Tools	Any	Indoors/Outdoors	A, B, C, D	Water must be combined with a surfactant. Full-face respirator required. Indoors tuckpointing requires enclosure with negative air machine to limit exposure to other workers.
Jackhammering	< 2 hours	Outdoors	B, D	Misting with hand water sprayer is not adequate.
	> 2 hours	Outdoors	B, C, D	Use water from building supply/hose to provide adequate water flow directly to chipping point.  
	Any	Indoors	A, B, C, D	Enclosure with HEPA-filtered negative air machine to limit exposure to co-located workers. Increase respiratory protection to full-face respirator or Powered Air Purifying Respirator when duration exceeds 2 hours.
Change HEPA Vacuum Collection Bag/Empty Dust Collection Canister	Any	Indoors/Outdoors	A or C, D	
	<4 hours	Outdoors	B, C	Sprayer must wear respirator.

Typical Jefferson Lab Silica Work*	Duration/ Scope per 8-hour shift	General Location	Required Controls**	Notes
Heavy Equipment and Utility Vehicles; Used During Demolition Activities (e.g., Hoe-Ramming)	>4 hours	Outdoors	B, C	Sprayer .

\*Tasks listed are typical for Jefferson Lab maintenance and operations. Jefferson Lab Industrial Hygiene Group must evaluate tasks not included in this table.

\*\*Controls - NOTE: OTHER PPE WILL BE REQUIRED FOR ADDITIONAL HAZARDS

A = Local exhaust ventilation or Point of Operation exhaust with HEPA filter & minimum flow rate of 25 cfm

B = Water

C = Half-face respirator with N100 or equivalent filtration

D = First-aid flush of eye contamination

Guidance by Jefferson Lab Industrial Hygiene, Jefferson Lab ES&H Manual 6683 – Appendix T1

**ATTACHMENT B: CONFINED-SPACE ENTRY****Confined-Space Entry****A. The Program**

1. A Subcontractor's Confined Space Entry Program must be submitted to and approved by the TR prior to working in any confined space at Jefferson Lab.
2. All Confined Space Entry Permits must be returned to the TR when the permit is no longer required.
3. Training: Subcontractors are to provide names and proof of training for employees engaging in confined-space entry, including the task for which they are trained (i.e., entry supervisor, attendant, entrant) and regulation for which employees are trained (i.e., 29 CFR 1926 and/or 29 CFR 1910).

**B. Minimum Elements of an Acceptable Program**

1. Provide name and qualifications of the responsible Competent Person assigned by the entry employer.
2. Include the process for:
  - a. Coordinating the confined-space work with Jefferson Lab and other adjacent work activities.
  - b. Obtaining Jefferson Lab's information about the permit space and previous entry operations.
3. Include descriptions of:
  - a. Evaluating spaces to determine whether a space is a confined space.
  - b. Include a list of atmospheric conditions that are always monitored.
  - c. How employees are notified of the locations of permit-required confined spaces
4. If Subcontractor employees will enter the space, provide a detailed written program and alternate entry procedures (if used).
5. At a minimum, the program must include a description of:
  - a. How the space is managed to prevent unauthorized entry or fall through the opening.
  - b. How hazards are eliminated or isolated prior to entering the confined space (e.g., purging, flushing, ventilating).
  - c. The equipment used to perform continuous forced-air ventilation.
  - d. The equipment used to initially and continuously monitor the atmosphere within the permit space (oxygen content, flammable gases/vapors, potential toxic air contaminants). Include calibration frequency and "bump test" frequency. NOTE: At Jefferson Lab, air contaminant exposure limits are based on 2016 ACGIH TLVs or current OSHA PELs, whichever are lower.
  - e. Actions taken if a hazard arises during an entry (e.g., ventilation stops, monitor alarm is activated, change in conditions).
  - f. How the space will be verified to ensure conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.
  - g. Role assignments (e.g., entry supervisor, attendant, and entrant).
  - h. Procedures for summoning rescue/emergency services (including procedures for summoning emergency assistance in the event of a failed non-entry rescue), for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue.
  - i. The permitting process.
  - j. Provide an example of the confined-space permit that will be used while on-site at Jefferson Lab.

**C. Process for Retaining Terminated (or Canceled) Permits**

1. All permits must be submitted to Jefferson Lab TR for retention

Reference: Jefferson Lab ES&H Manual Chapter 6160