Sandia National Laboratories

Section 01 35 23–Environment, Safety, and Health for Construction Contracts

SPC-015

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U.S. DEPARTMENT of ENERGY

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Change Log

Last Edited Date	Change Type	Change Description	Change Requester
04/01/2026	Sub	• Removed non-requirement statement, Section 2.8 B: High-Risk Work • Removed Welding, Cutting, and Brazing (WCB) permit requirement (Sections 1.4 J Submittals Subsection, 1.6 W3(c) Contract-Specific Safety Plan, Contractor's Industrial Hygiene Program, 2.7 H (1) General Project Work Practices, Hot Work Permit, Appendix G. Hierarchy of Controls (page G-5) • Added verbiage for clarification, Section 2.8 A High-Risk Work, • Clarified verbiage focused on AHA, Section 2.8(2) High-Risk Work • Revised verbiage to expand beyond CSSP, Section 1.5E(3) Quality Assurance, Site Supervision • Added crane entity account, Section 2.7 T(a)6, General Project Work Practices, Hoisting, Rigging, and Load Handling • Added clarity for below the hook training requirements, Section 2.7 T(9)e(iv), General Project Work Practices, Hoisting, Rigging, and Load Handling, Critical Lift Requirements • Removed 'travel restraint' from statement for clarity. Section 1.6 M(3) Contract-Specific Safety Plan, Fall Protection • Clarified submittals of excavation permits. Section 2.7(C) General Project Work Practices, Excavation Permit; and 2.7(D) Penetration Permit • Added clarification on potholes. Section 2.7(C)(1)g General Project Work Practices, Excavation Permit • Added section on Weather Conditions specific to lightning and wind. Section 2.7(DD) • Added verbiage for clarification. Section 1.6 W(3b) Contractor's Industrial Hygiene Program • Changed verbiage and rearranged language to flow better, Appendix C Rescue of Personnel in Confined Spaces at Sandia/NM • Appendix E Respirable Crystalline Silica in Construction Guide: Engineering Controls, Work Practices, and Respiratory Protection • Added ASTM standard to References section	M .Starr
04/09/2025	Admin	• Fixed date on title page and headers; formatting	M. Starr
04/01/2025	Sub	• Updated Definitions, section 1.3 • Updated Hazard Communication for clarification, section 1.6I • Added clarification as to when a written rescue plan is needed, section 1.6N. • Added information on high visibility apparel, section 1.6R • Removed Appendix F • Added guidance under Heavy Equipment Staging, section 1.6Y AA • Referenced construction light illumination requirements, section 2.5C • Updated Excavation and Permit Sections, sections 2.5 C&D • Updated Fugitive Dust Control Permit and Storm Water sections for clarity, sections 2.7 J&K • Added a new section on Electrical Manholes, section 2.7V • Updated Controls for Silica (Installing or removing drywall, cutting drywall and dry sanding), section Appendix E.	M. Starr

Last Edited Date	Change Type	Change Description	Change Requester
03/21/2024	Sub	• Changes include editorial changes, changes to an arc flash electrical table, changes to fall protection text, reference to Construction Hazards Checklist/Safety Acknowledgement Form and formatting changes. • Previous document was not posted to contractor hub	M. Starr
09/21/2023	Dev	• New document using 01065 spec as baseline (standardized terminology, clarified verbiage, added training and safety requirements, reorganized sections, deleted unnecessary sections)	M. Ghattas, M. Starr, and R. Colgrove

Note 1: The SME is responsible for updating the change log.
Note 2: Vertical bars in the right margin denote a change made to the paragraph from the last issue (not including deletions). Refer to the change log for specific updates.
Note 3: All referenced specification sections can be accessed through the Contractor Hub or the respective website for codes and standards.

Acronyms and Definitions

Acronym/Term	Definition
ACC	Accessories
ACGIH	American Conference of Governmental Industrial Hygienists
AFH	arc-flash hazard
AHA	activity-hazard analysis
ANSI	Americans National Standards Institute
APF	assigned protection factor
AR	arc-rated
ASME	American Society of Mechanical Engineers
BBS	behavior-based safety
BEI	biological exposure indices
C&D	construction and demolition
CFR	Code of Federal Regulations
CM	Construction Manager
CMU	concrete masonry unit
CSSP	contract-specific safety plan
DOE	Department of Energy
EAP	emergency action plan
EMCC	Emergency Management Communications Center
ES&H	environment, safety, and health
ESC	electrical switching clothing
ESE	electrical systems engineer
ESWC	electrically safe working condition
EWC	everyday work clothing
FPIP	fire protection impairment permit
GFCI	ground-fault circuit interrupter
HEPA	high-efficiency particulate air
IFC	International Fire Code
ISC	intermediate switching clothing
ISMS	Integrated Safety Management System
JSHE	job site hazard evaluation
LOTO	lockout/tagout
NAC	notification appliance circuit
NFPA	National Fire Protection Association
NMED	New Mexico Environment Department
NORM	naturally occurring radioactive materials

Acronym/Term	Definition
NTESS	National Technology and Engineering Solutions of Sandia, LLC
OMP	occupational medicine provider
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PEL	permissible exposure limits
PPE	personal protective equipment
PRCS	permit-required confined space
PTP	pre-task plan
PVC	polyvinyl chloride
RMA	radioactive material
ROPS	roll-over protective structures
SAE	supervisor authorizing entry
SCI	Sandia Code Inspector
SCM	Sandia Construction Manager
SDR	Sandia-Delegated Representative
SDS	safety data sheet
SME	subject matter expert
SOW	scope of work
SP	Subcontracting Professional
SPM	Sandia Project Manager
SE	Safety Engineering
SSP	Sandia Subcontracting Professional
SWPPP	Storm Water Pollution Prevention Plan
TLD	thermoluminescent dosimeter
TLV	threshold limit value
TPO	thermoplastic polyolefin
UST	underground storage tank
WSHP	Worker Safety and Health Program

PART 1. GENERAL

1.1. Summary

A. The Contractor is responsible for ensuring a safe work site that meets the requirements of this specification section during all periods of the execution of this contract.

B. This specification outlines requirements and guidelines for performing work while ensuring the protection of the environment, property, and the safety and health of Contractors, Sandia National Laboratories (Sandia) and Department of Energy (DOE) employees, visitors to Sandia, and members of the public.

C. A Sandia-approved contract-specific safety plan (CSSP) is required for all construction contracts and prior to any physical work taking place. This specification identifies required elements of all CSSPs, model language and templates, guidance, and additional resources to help Construction Contractors prepare CSSPs. Each contract should tailor their safety plan and formulate safety procedures and rules applicable to their operations and work environments.

D. Related Sections: Refer to the following sections for related work:

1. Section 01 74 19, “Construction Waste Management”
2. Section 01 57 26, “Dust Control”
3. Section 26 04 75, “Primary System Safety Requirements”

1.2. Roles and Responsibilities

Sandia Subcontracting Professional (SP)	Also called the buyer, the Sandia Subcontracting Professional (SP) is the procurement professional who acts to fulfill a Requester's requirement. Often working in consultation with the Requester, the SP obtains quotations, negotiates and awards subcontracts, and administers subcontracts after awards have been made. The SP is authorized to act as official representative of Sandia for the specific purpose of administering the contract, including payment authorization and approval for change orders. The SP is the only person who may legally obligate Sandia for expenditure of funds, change scope, change level of effort, change terms and conditions, negotiate, and sign documents legally binding Sandia commitment. Obligations or promises, implied or expressed, by Sandia personnel other than the SP do not bind Sandia in any manner.
Sandia-Delegated Representative (SDR)	Person in the contract who is authorized to act as delegated Sandia representative for the specific purpose of review, inspection, and acceptance of work, and to interpret plans, specifications, codes, and standards. The SDR shall not exercise supervision over Contractor's employees. The SDR has the sole authority to pause or suspend work for reasons of quality, safety, or contractual concerns and interpret specifications. This does not prevent any individual from pausing unsafe acts.
Sandia Construction Manager (SCM)	The SCM supports the project, performs behavior-based safety (BBS) and Contractor evaluation observations, and reviews and accepts the CSSP, providing written justification/authorization for energized electrical work, as well as helping to coordinate construction permits and outages with the Sandia Construction Inspector. The SCM is a daily point of interface with the Contractor on performance and schedule issues and helps resolve construction, environmental, and safety issues. The SCM also coordinates work with the customer and infrastructure teams.
Sandia Code Inspector (SCI)	The SCI is the SDR’s contract field representative who monitors, documents, and reports on the progress and quality of construction work in accordance with contract specifications and plans and applicable codes. The SCI assists in coordinating outages for construction operations. The SCI shall not exercise supervision over Contractor's employees.

Sandia Environmental, Safety, & Health Support Team	Personnel authorized to act as official representatives of Sandia for the specific purpose of supporting SDRs, SCMs, SCIs, and Safety Engineering with environment, safety, and health (ES&H) observations and resolution of issues/concerns associated with Contractor ES&H performance. The team has representation from Sandia's Safety Engineering, Industrial Hygiene, Environmental, Radiological Protection, and Asbestos programs.
Sandia Project Manager (SPM)	Person responsible for the overall project to include financial and schedule responsibilities. The SPM shall not exercise supervision over Contractor's employees.
Safety Engineering (SE)	Sandia ES&H organization personnel who conduct oversight of Contractor activities to ensure requirements are understood, planned, and implemented. The group is composed of trained and experienced safety engineers, industrial hygienists, environmental/waste specialists, and health physicists who support Facilities by ensuring contractors have adequate mitigations in place to manage hazardous construction activities. SE reviews and concurs on CSSPs, activity hazard analyses (AHA), work permits, and other job hazard plans. SE also conducts site visits to validate control implementation, attends weekly progress meetings to discuss and provide updates on safety, and supports Quarterly Construction Safety Seminars.
Facilities Prime Construction Contractors (Contractor)	The Contractor is the entity that is contracted to National Technology and Engineering Solutions of Sandia, LLC (NTESS) to perform construction activities, per the contract documents.

1.3. Definitions

Activity Hazard Analysis (AHA)	A documented process by which the steps (procedures) required to accomplish a work activity are outlined, the actual or potential hazards of each step are identified, and measures for the elimination or control of those hazards are developed. Activities are general classes of separately definable construction work (for example, excavation, foundations, structural steel, and roofing). There are two conditions when an AHA is required, either as an addendum to an approved CSSP when the scope of the CSSP does not adequately address the hazards that could be encountered and/or when conducting any work that may result in serious injury (illness) or a fatality if performed improperly (i.e., high-risk work). The Contractor's process for describing how and when AHAs are used is a required section of the CSSP. Additional steps (procedures) may be required when a) the work is specific to a certain location and work activity, b) the work is referenced to a specific excavation or penetration permit, or c) the work within the excavation or penetration permit has identified a high-voltage or other high-risk hazard.
Engineered Fall Protection System	A passive fall protection system such as guardrails, or an active fall protection system that is designed and verified to meet ANSI Z359 industry standards.
Pre-Task Plan (PTP)	A pre-task plan (PTP) is developed with coordination between the site superintendent and work crew members at the start of each day, prior to beginning work. The intent of a PTP is to promote worker participation in identifying hazards and how they will be controlled at the task level. The PTP consists of a step-by-step description of the tasks to be performed for the upcoming shift, the hazards of each step, and the ways in which each hazard will be controlled (following the hierarchy of controls). A "task" is a segment of work to be done as part of a construction project The day's tasks, personnel, tools, and equipment that will be used to perform these tasks are listed in the PTP. The PTP may reference other work planning documents including the CSSP, applicable AHA, or job site hazard evaluation (JSHE), which should be reviewed while creating the PTP, and will be available at the job site. This approach helps everyone involved in the job understand the planned activities, the hazards associated with the activities, and required controls, prior to initiating work. The PTP shall be revised if the planned work scope is modified, tools or equipment to be used are changed, new hazards are identified or new personnel join the work team, etc. **NOTE:** PTP examples are included in Appendix F for optional use.

High-Risk Work	High-risk work is defined as work that may result in serious personal injury, illness, or a fatality if performed improperly. The increased risk may be attributed to characteristics inherent in the work task, location, materials, or proximity to other hazards. High-risk work activities include but are not limited to the following activities: • Critical crane lifts • Penetrations into structures with high-voltage hazards (including but not limited to electric duct banks, electric manholes, or concrete electric pull boxes) • Excavation within 5 ft of known hazardous energy utilities (electrical, natural gas, other pressurized systems, etc.) or personnel entry into an excavation > 5 ft in depth • Energized electrical work • Work within 10 ft of aerial high-voltage power lines (> 50kV) • Wall, floor, ceiling, or roof penetrations where a site investigation cannot identify all potential hidden hazards • Permit required confined space entry • Roof work within 6 ft of an edge not protected by standard guardrails, parapets, or similar physical barriers • Elevated work without the use of an approved ladder or engineered fall-protection system greater than 6 ft above a lower level or within 15 ft of an unprotected side or edge for all construction trades, excluding roofers. For roofers, the requirement is within 6 ft of an unprotected side or edge.
Behavior Based Safety (BBS)	Behavior-based safety is a process where management works in partnership with employees to learn to observe and recognize behaviors and conditions that increase the risk of injuries and modify those behaviors and conditions to lower or eliminate those risks. BBS focuses on what people do, analyzes why they do it, and then applies a research-supported intervention strategy to improve what people do.

1.4. Submittals

A. Contract-Specific Safety Plan

Submit in accordance with Paragraph 1.5, "Quality Assurance," requirements for review and approval by the SDR prior to commencement of physical on-site work.

B. Safety Plan Addendum

1. Submit modification to CSSP if required to address activity hazards not previously identified in CSSP.
2. Submit discipline-specific subcontractor safety plans that address discipline-specific hazards (i.e., electrical or mechanical) when the contractor intends to use those plans as controls for specific hazards.

C. Activity Hazard Analysis

1. Submit a task-specific activity-hazard analysis (AHA) to Sandia for any high-risk work as defined in Paragraph 1.3 of this document.
2. An AHA may also be used to address hazards and mitigation steps not addressed in the Contractor's approved CSSP and to address hazards specific to high-risk excavation and/or penetration permit requests.

D. Storm Water Pollution Prevention Plan

1. Complete and submit a notice of intent for a Sandia-furnished Storm Water Pollution Prevention Plan (SWPPP) when indicated in the contract documents.
2. The Contractor shall adopt the Sandia-furnished SWPPP and adhere to all requirements identified in the plan.

E. Fugitive Dust Control Permit

Complete a Sandia-furnished application for a Fugitive Dust Control Permit when indicated in the contract documents, and follow all requirements identified in the permit.

F. Excavation Permit

Submit an excavation permit request (SF 2001-EP) when performing certain work activities. Follow all details and requirements as indicated on the permit. Refer to Paragraph 2.7, "General Project Work Practices," Subpart C, "Excavation Permit" for additional information.

G. Penetration Permit

Submit a penetration permit request (SF 6610-PP) when performing certain work activities. Follow all details and requirements as indicated on the permit. Refer to Paragraph 2.7, "General Project Work Practices," Subpart E, "Penetration Permit" for additional information.

H. Hot Work Permit

Submit a Hot Work Permit request (see PCD-153, *Hot Work Permit Procedure*) prior to executing work that will create sparks, flames, or excessive heat. Follow all details and requirements as indicated on the permit.

I. Fire Impairment Permit

Submit a Fire Impairment Permit request (FRM-058) prior to executing work that may have the potential to impact a fire alarm or fire protection system, including dust-generating activities, equipment shutdowns, or heating, ventilation, and air conditioning (HVAC) equipment or spaces with smoke detection devices within the airstream. Follow all details and requirements as indicated on the permit.

J. Lift Plans

Submit a lift plan for all crane lifting operations (SF 2001-OLP for ordinary lift plans and SF 2001-CLD for critical lifts)

K. Competent Person Credentials

Submit competent person's credentials, which may include a Professional Engineering license, when required by 29 CFR 1926 for activities that require a competent person to oversee them, if requested by the SDR.

L. Superintendent Qualifications

1. A Contractor responsible for high-risk work shall ensure that an evaluation of superintendent qualifications has been performed to ensure knowledge of the CSSP and contract requirements for safe execution of activity-level work.
2. Submit the superintendent qualifications for Sandia review, if requested by the SDR.

M. Training Records

Training records shall be made available upon the SDR's request to verify that the persons performing certain tasks are qualified.

1.5. Quality Assurance

A. Regulatory Requirements

1. Comply with applicable ES&H laws, rules, and regulations, as amended, of the federal, state, and local governments, DOE, and Sandia, as indicated in Paragraph 1.8.
2. Adhere to safety rules and regulations and access restrictions and emergency egress procedures that are unique to the Contractor's work at Sandia-controlled premises, as defined in the following paragraphs of this specification, the contract documents, and as determined through consultation with the SDR.

3. Sandia conducts routine work site observations to identify safety and environmental regulatory non-compliances and opportunities for improvement, and it reports non-compliances to improve safety program performance. These observations and the information gathered for trending and analysis are critical to the success of Sandia's construction program. Observers have a responsibility to inform the SDR in real time of inadequate controls of a serious nature which, if not immediately corrected, warrant consideration of a work pause to be issued by the SDR.

B. Flow Down of Requirements

1. The Contractor shall flow down the requirements identified in this specification to all subcontractors and visitors at all tiers. The Contractor is responsible for ensuring that all subcontractors are familiar with this specification and diligently execute work consistent with the requirements and guidance specified herein. The Contractor shall validate that these requirements are accurately and completely flowed down to all subcontractors through training, orientation, direct observation, and other performance assurance methods.
2. Sandia personnel or Sandia contracted support staff shall have the authority to:
   a. validate that contractors are knowledgeable of the CSSP requirements applicable to their work,
   b. ensure that the work is being performed in accordance with a documented safety plan,
   c. stop unsafe activities or those that do not meet the requirements in the CSSP, and/or
   d. resolve any non-compliance with applicable ES&H requirements for this contract and for subcontracts for all tiers associated with this contract.

C. Contractor Safety Representative

The Contractor Safety Representative shall ensure compliance and implementation of requirements in the CSSP and may or may not be the designated "competent person" as prescribed by 29 CFR 1926. The proposed Safety Representative shall be subject to acceptance by SDR based on the scope of work, anticipated hazards, and training and experience that meet the following minimum requirements:

1. **Education:** Two-year degree with course work in occupational health and safety, industrial hygiene, environmental engineering, or related field. Documented experience in safety inspection and coordination may be substituted on a year-for-year basis in lieu of formal course work. Successfully completed an Occupational Safety and Health Administration (OSHA) 30-hour construction class
2. **Experience:** Two years of documented experience in safety inspection and coordination.
   a. Shall be knowledgeable of the following:
      i.) Principles and practices of industry and construction site safety
      ii.) Safety and occupational health laws and procedures
      iii.) Methods of assessing safety hazards and controls
      iv.) Hazardous material storage and transfer procedures
      v.) Emergency preparedness activities

D. Competent Person

When a competent person is required by OSHA or the CSSP for work to be performed, the following shall be completed prior to starting work:

1. identify the competent person in the PTP;
2. submit competent person's credentials, which may include a Professional Engineering license when required by 29 CFR 1926 upon the request of the SDR; and
3. ensure that the competent person can be on-site and overseeing the work activities being performed.

E. Site Supervision

During all periods of active construction, the Contractor shall have a designated representative (Superintendent or Qualified Delegate) on the construction work site who performs the following:

1. Is knowledgeable of the work activities they oversee and the project's hazards, with full authority to act on behalf of the Contractor
2. Shall perform a daily pre-work evaluation of subcontractors using a tool such as the "Facilities Superintendent – Job Aid" provided in Appendix B to ensure the following:
   a. Has knowledge of CSSP safety requirements that are applicable to their work
   b. Has evaluated how these safety requirements will be implemented
   c. Plan for periodic management surveillances, supervisor pre-job briefs, and assessments

F. Shall perform frequent and regular inspections of the construction work site to identify and correct any instances of non-compliance.

1. The Superintendent or delegate shall document the inspections, including any non-compliance and corrective action taken
2. May delegate their authority to a subcontractor in certain cases; however, the delegated subcontractor must have an active contract purchase agreement with Sandia
   a. Although supervisory responsibilities have been transferred to a Subcontractor, the Construction Contractor that has the contract with Sandia is still responsible for the safety requirements of the project
3. Be available to workers of all tiers, who are instructed to report hazards not previously identified or evaluated to them
   a. If immediate corrective action is not possible, or the hazard falls outside of project scope, the Superintendent or delegate shall perform the following:
      i.) Immediately notify affected workers
      ii.) Post appropriate warning signs
      iii.) Implement necessary interim control measures
      iv.) Notify the SDR or Sandia Construction Manager (SCM) of the action taken

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NOTE: A Contractor responsible for high-risk work shall ensure that an evaluation of superintendent qualifications has been performed to ensure knowledge of the CSSP and contract requirements for safe execution of activity-level work. If the Superintendent is changed during a project, the Contractor shall resubmit the superintendent qualifications for Sandia review, if requested by the SDR.

G. Training

1. Contractor and subcontractors shall certify on the Sandia/New Mexico Facilities Contractor Badge/Clearance Request form that employees have received the following training:
   a. 10-hour OSHA training
   b. Training for Standard Specification Section 01 35 23, "ES&H for Construction Contracts"
   c. Contractor's CSSP
2. Contractor is responsible for ensuring subcontractors have received the above training prior to being authorized to perform work.
3. Contractor shall ensure training records are made available for review upon request by the SDR.

H. Contractor Safety Program Self-Assessment

The Contractor shall perform one written self-assessment of one element of its safety program per quarter. Examples of elements for self-assessment are training compliance, ladder inspection, fall-protection program, BBS observations, and review of documented safety inspections. These self-assessments shall be made available for review upon request by the SCM or SDR.

I. Sandia Safety Oversight and Compliance Monitoring

Sandia personnel or Sandia contracted support staff have the authority to conduct reasonable observations and investigations for oversight purposes, including but not limited to ensuring compliance with applicable Sandia, federal, and state regulations related to worker safety, health, and environmental compliance. This includes but is not limited to review of worker training records (furnished at the request of the SDR), environmental (area) sampling, and attachment of personal sampling equipment/devices, such as dosimeters, pumps, and badges, to construction contract personnel to monitor or measure exposures. Monitoring results can be provided to the Contractor.

1.6. Contract-Specific Safety Plan

A. General

Develop and submit a CSSP that meets the following requirements:

1. A cover sheet that indicates the following items for each purchase order or contract:
   a. Title – All CSSPs shall be titled “Contract-Specific Safety Plan”
   b. Contractor company name
   c. Sandia purchase order (PO) or contract purchase agreement (CPA) number that the CSSP will be applied to
   d. Date of initial submission
   e. Revision date (as applicable)
2. A Table of Contents with title of each section based on the topic discussed and page number
3. Submit the entire document together (do not send each section separately)
4. State the nature of the work, potential hazards anticipated, and how these hazards will be mitigated.
5. Identify the process on how hazards that are not addressed in the CSSP will be mitigated or addressed.
6. Identify how workers, including subcontractors, service providers, area/building occupants, site visitors, and/or pedestrians in the vicinity of the construction activities will be protected from hazards for each separately definable construction activity (e.g., excavation, foundations, structural steel, electrical, and roofing).
7. Address OSHA CFR 1926, American Conference of Governmental Industrial Hygienists (ACGIH), and Sandia-specific requirements identified in Section I and Section II (Standard Terms and Conditions) of the Contract, Uniform Construction Package (UCP), job site hazard evaluation (JSHE), and this specification.
8. All requirements and recommendations identified in the project-specific JSHE shall be considered part of the CSSP as an attachment, unless an alternate hazard control/mitigation for the identified hazards has been submitted by the Contractor and accepted by the SDR.
9. The CSSP shall incorporate elements of the Integrated Safety Management System (ISMS) and Engineered Safety as described below, including but not limited to safe-by-design intent; understanding of the operational and technical basis of the work; identifying, analyzing, and controlling hazards and energy sources; making risk assessments and eliminating unacceptable consequences; and engaging in positive verification.

10. Lower-Tier Subcontractor CSSPs

    The Contractor may incorporate subcontractors' CSSPs as a CSSP Addendum and submit for review and approval by Sandia.

B. Review Frequency

1. The Contractor shall review an approved CSSP annually and update as needed to ensure the CSSP covers all planned work, associated hazards, and required hazard controls.
2. A CSSP shall be approved for a maximum of 3 years. A CSSP review period may be extended for up to 1 additional year by written approval of the SDR.
3. An approved CSSP shall be reviewed and updated within 60 days when there is a significant change to this specification's requirements impacting the adequacy of the CSSP. The SDR is responsible for determining if the specification change is significant.

C. Workplace Inspections

The CSSP shall describe the Contractor's methods for performing and documenting workplace inspections. (An example of an acceptable documentation method would be documenting the inspection in the Superintendent's daily logbook.) The documented inspection shall be maintained for the duration of the contract and made available for review upon request by the SDR.

D. Substance Abuse Prevention and Testing

1. Use of drugs (including misuse of prescribed substances) or alcohol on-site shall be grounds for removal of the individual from the work site and may include other corrective actions, including contract termination.
2. The CSSP shall indicate the contractor's Substance Abuse Prevention and Testing program and indicate requirements for testing and other actions taken by the Contractor in the event of a positive result.

E. Radiological Safety

The CSSP shall identify how the Contractor shall perform work in a radiological area that meets the criteria below:

1. Employees may not enter an area that contains a posted radiological sign, as signified by a radiation symbol on a yellow background with black or magenta markings, without prior authorization and Sandia-provided training appropriate for radiological hazards.
2. Performance of work in all radiological posted areas, including controlled areas and radioactive material areas (RMA) and all work in Technical Area V, requires the Contractor to have a Customer Work Release (FRM-338) signed by the Sandia space owner prior to initiating work.

F. If work is required in a posted area, and specific written instructions have not been issued, do not enter the area. Contact the SDR or Safety Engineering (SE) for instructions.

1. A JSHE is not required for work in controlled areas or RMAs unless:
   a. Additional hazards (chemicals, biohazards, etc.) have been identified.
   b. The area is posted for additional radiation hazards (i.e., radiation area)
2. For performance of work in radiological areas posted as a radiological buffer area (RBA), radiation area (RA), high radiation area (HRA), very high radiation area, airborne radioactivity area (ARA), contamination area (CA), or high contamination area (HCA), ensure the following:
   a. A JSHE for work activity/task performed in radiological areas is obtained.
   b. Employees understand and follow JSHE requirements.

c. A radiological technical work document is obtained, when required by the Sandia Radiation Protection Department, and provisions and requirements are understood and followed.
d. Employees shall be current on radiological training required for site or activity/task (e.g., General Employee Radiation Training, Rad-Worker I, or Rad-Worker II).
e. Employee shall be 18 years of age or older.
f. Comply with contract requirements for work in radiological areas.
g. Comply with the CSSP for work at Sandia.

3. **Dosimetry:** Workers with appropriate training and who have elected to work in radiological areas may be required to participate in Sandia's external and internal dosimetry monitoring program. Contractors participating in the dosimetry monitoring program shall ensure their thermoluminescent dosimeters (TLD) are current. TLDs must be returned to the SDR for exchange by the last day of the quarterly expiration date. Failure to exchange in a timely manner may result in loss of the TLD.
4. Each project involving use of an accountable radioactive source or radiation-generating device requires prior approval by SDR and Sandia's Radiation Protection Department. Examples of such devices include but are not limited to soil testing densitometers and XRF analytical devices for lead detection.

G. Hazard Mitigation or Protection

The CSSP shall conform to requirements of this specification as applicable to the work activity/task being performed. Mitigation or protection shall meet the intent of 29 CFR 1926 and 29 CFR 1910, as applicable. Sandia ES&H requirements that exceed the requirements of 29 CFR 1926 or 29 CFR 1910 are identified in this specification.

1. Address hazards that exist at Sandia project site where work will take place. Include hazards identified in the Sandia JSHE, as well as hazards that are introduced to the project by the construction process. Include protective measures (e.g., scaffolding and shoring, as required) identified by a Professional Engineer or other professional.

H. Hidden Hazards Penetration

1. The CSSP shall identify the contractor's steps and processes to safely mitigate hidden hazard penetrations, as indicated in subsequent paragraphs.
2. The CSSP shall include steps and processes for excavating adjacent to underground utilities, areas where an assessment cannot occur, and concrete penetrations.

I. Hazard Communication

1. The CSSP shall identify how documentation of hazard communication is maintained, including identifying workers' names, dates of communication, activities, and/or tasks, hazards, and controls.
2. The CSSP shall identify how the Contractor shall manage the inventory of all chemicals or chemical products anticipated for use on the project. Documentation of all chemicals (i.e., SDSs) or chemical products, anticipated for use on the project, will be maintained and available.
    a. The Contractor shall describe how chemicals or chemical products will be used and the controls that will be established to ensure they do not present an exposure hazard to construction workers or collocated Sandia workforce members. An exemption to this requirement is consumer products used in the same form, quantity, and concentration as a product packaged for distribution and use by the general public (such as Windex, Simple Green, and WD-40 in packages sold for use by the general public).
    b. The CSSP shall identify methods to inform workers, regardless of tier, of the nature of work, potential hazards anticipated, and how these hazards will be mitigated, or how

workers will be protected from hazards, prior to commencement of work activities and/or tasks.

c. Hazard communication to workers must include a clear link between the work activity/task, the hazards identified for the work activity/task, and the controls that will be implemented to protect personnel in the area, the worker performing the work activity/task, and the environment from the identified hazards.

J. Hoisting, Rigging, and Load Handling

The CSSP shall identify the process, steps, and actions that the Contractor shall perform for hoisting, rigging, and load handling as identified in subsequent paragraphs.

K. Confined-Space Entry

1. Contractor work practices and procedures shall incorporate all applicable regulatory requirements and Sandia specifications. Knowledge of applicable regulatory standards should be considered fundamental for any Contractor who proposes to engage in confined space entries at Sandia.
2. If the Contractor will enter confined spaces, the CSSP shall include the Contractor's confined space entry program that meets the requirements identified in subsequent paragraphs.

L. Hazardous Energy Control

Contractor shall implement lockout/tagout (LOTO) requirements when the unexpected energization or startup of equipment, or release of stored energy, could harm employees. Energy sources include electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other types of energy.

1. The CSSP shall identify the Contractor's LOTO program that meets the above requirements and is identified in subsequent paragraphs.

M. Fall Protection

1. Implement appropriate controls to protect employees from fall hazards, which may include elimination, engineering controls, administrative controls, personal protective equipment (PPE), and other controls necessary for protecting personnel working at heights.
2. The CSSP shall identify the Contractor's fall protection program that meets the requirements identified in subsequent paragraphs.

N. Develop a written rescue plan for activities involving workers who could be in a suspended state while wearing a full body harness at fall arrest, or work positioning.

1. Include rescue personnel contact information, availability, and notification instructions.
2. Include prompt rescue information (guidance: prompt is within 15 minutes).
3. List available rescue equipment (e.g., ladders) and where this equipment is located.

O. Waste Management and Disposal

1. General Requirements
   a. Construction project non-hazardous non-regulated waste shall be managed in accordance with Section 01 74 19, "Construction Waste Management."
   b. Property items and equipment that may be reused for their intended purpose are not considered waste and shall be managed as U.S. government property.
   c. Waste generated during construction operations may be classified as regulated or hazardous waste. Details for waste management of commonly generated waste types are contained in Section 01 74 19.
2. Construction and Demolition Debris

   As defined by 20 New Mexico Administrative Code 9.1, "Construction and demolition debris" means materials generally not water soluble and non-hazardous in nature, including but not limited to steel, glass, brick, concrete, asphalt roofing materials, pipe, gypsum

wallboard, and lumber from the construction or demolition of a structure project, and rocks, soil, tree remains, trees, and other vegetative matter that normally result from land clearing.

a. If construction and demolition debris is mixed with any other types of solid waste, it loses its classification as construction and demolition debris.
b. Construction and demolition debris does not include asbestos, liquids such as waste paints, solvents, sealers, adhesives, or potentially hazardous materials.

3. Residue Material and Equipment
   a. Intact and dismantled equipment and material removed while performing construction operations shall remain the property of the government.
   b. If the equipment and material is not reused in the performance of the project, the Contractor shall manage it as residue material and equipment.
   c. All residue material and equipment shall be staged by the Contractor and evaluated for hazardous and radioactive contamination by Sandia personnel before being delivered to the reapplication yard.
4. Empty Containers
   a. In order to be disposed as construction and demolition (C&D) waste, containers that held non-regulated products shall not contain any free liquid.
   b. Containers that have free liquid, or previously contained hazardous material, shall be submitted to the hazardous waste management facility.
   c. As a best business practice, use as much material as can be removed from containers. To absorb residual liquids, place a small amount of floor dry absorbent material (kitty litter, vermiculite, etc.) into empty or nearby empty product containers.
   d. Used aerosol cans that contain any amount of propellant or product must be managed as hazardous waste. At Sandia/New Mexico, if an aerosol can is empty of propellant and product, is no longer pressurized, and does not contain residue of an acute hazardous waste, it is considered an empty container and may be disposed of as regular trash.
      i.) Do not spray out the remaining contents of an aerosol can for the sole purpose of emptying it.
      ii.) Never puncture an aerosol can.
5. Lamps

   Fluorescent, sodium, and incandescent lamps shall be removed from light fixtures and managed as regulated waste, but not as C&D waste. These items shall be boxed and labeled to identify the contents. Notify the Construction Manager to coordinate waste pick up.
6. Light Ballasts
   a. Remove ballasts from all light fixtures and submit the residue material for characterization by the Sandia ES&H team.
   b. Ballasts clearly labeled “No-PCBs” shall be placed in a container for disposal.
      i.) Ballasts that are NOT clearly labeled “No-PCBs” shall be managed as waste polychlorinated biphenyls (PCB). Place waste PCBs and PCB items in a container that is capable of preventing the spread of contamination unless the PCBs are completely contained by the item, such as totally enclosed electrical equipment. Place waste-contaminated items, such as PPE and rags, in a sealed plastic bag with a minimum 6-mil thickness to prevent the spread of contamination.
      ii.) Light fixtures installed prior to 1980, with evidence of ballast leaks, shall be removed and treated as waste PCBs.
      iii.) All waste PCBs must be double bagged or double wrapped with the words “Removed from Service on _____ (supply the correct date).”

iv.) Notify the Construction Manager to coordinate waste pickup within 30 days.

7. Oil-Containing Equipment

   Equipment containing oil or other petroleum products shall be drained of oil and managed as residue material. Drained oil shall be managed as either used oil for recycle or chemical waste if contaminated. Notify the Construction Manager to coordinate waste pick up.

8. Chemical Waste/Hazardous Waste
   a. At Sandia, chemical wastes are managed as regulated or hazardous wastes.
   b. This designation applies to all chemical wastes, used oil, asbestos-containing wastes, and PCB-containing wastes as examples.
   c. Because of regulatory liability, NTESS assumes responsibility for management and disposal of chemical wastes.
   d. Chemical wastes shall be managed as hazardous waste, unless specific guidance is provided in the contract.
   e. Coordinate hazardous chemical waste disposal through Sandia's ES&H team. The procedure for disposal of chemical/hazardous waste is as follows:
      i.) Coordinate all waste management activities with the SCM and ES&H waste management support.
      ii.) The following actions are required, and the ES&H team will provide support in the following:
         - All items must be inventoried.
         - All containers need labels, and labels shall include contents, project number or name, and contact phone number.
         - Notify the SCM that waste is ready for pickup as soon as possible.
         - Sandia personnel pick up the waste and determine the appropriate disposal method.

9. NORM Materials
   a. Naturally occurring radioactive materials (NORM) used in commercial products that have measurable radioactivity above Sandia-established policy (which includes State of New Mexico established limits) shall be managed as radioactive waste when declared waste and is not deemed for Reapplication. Some examples are as follows:
      i.) Ceramic insulators (with some exceptions)
      ii.) Glass-containing thorium or uranium for coloring purposes
      iii.) Smoke detectors

10. Radioactive Waste
    a. Radioactive waste is not expected to be identified at this stage of the process.
    b. Radioactive hazards should be identified during the JSHE process.
    c. If material is discovered to be radioactive, then all work should be paused and the Sandia ES&H team should be notified.

11. Mixed Waste

    Mixed waste is not expected to be identified at this stage of the process. Mixed waste should be identified during the JSHE process. If material is discovered to be mixed during this activity, then all work should be paused and the Sandia ES&H team should be notified. Mixed waste can only be generated with written Sandia approval.

P. Transportation of Hazardous Waste

Facilities construction contractors are prohibited from transporting hazardous waste.

Q. Hazard Identification Signage and Barricades

1. The CSSP shall identify how signs and barriers will be used on construction sites:
   a. Hazard identification and barricades shall be provided and installed in accordance with 29 CFR 1926 to warn of specific work hazards and to communicate safe detours to personnel in the vicinity of the site.
2. Use flagging and tape barricades for temporary or interior protection only, unless otherwise accepted by SE.
   a. Use orange safety fencing or snow fencing around excavations and trenching. Fencing shall be a minimum of 4 ft high (1.2 m high) and secured vertically every 10 ft (3 m).
   b. Protect unattended sites with applicable signs and barricades at all times.
3. The CSSP shall describe how personnel are trained to understand sign warnings and instructions prior to the start of work.

R. Site Control and Minimum PPE

1. The CSSP shall identify how the Contractor will be responsible for the safety of personnel on the construction job site and shall ensure that persons working or visiting the job site comply with safety requirements identified in the CSSP.
2. The Contractor shall ensure that Contractor and Subcontractor employees and visitors on the project job site wear the necessary PPE. The following are the minimal PPE requirements for all Sandia construction work areas:
   - ANSI Z87 Safety Glasses with Side Shields
   - ANSI Z89.1 Head Protection
   - ANSI//ISEA 107-2010 Performance Class 1 High Visibility Apparel (required to be worn during all activities that perform traffic operations, heavy equipment movement, or for activities identified in the Contractor's CSSP)
   - Protective footwear that complies with 10 CFR 1926.96 shall be worn when the PTP hazard assessment identifies a foot hazard. Hazards could include injuries due to falling or rolling objects, objects piercing the sole, or when the use of protective footwear will protect the affected employee from an electrical hazard, such as a static-discharge or electric-shock hazard, that remains after the Contractor takes other necessary protective measures.
3. Protective clothing for welding, cutting, and allied processes shall be selected to minimize the potential for ignition, burning, trapping hot sparks, or electrical shock.
4. The Contractor has responsibility and authority to deny access to any person entering a construction site if they do not have appropriate PPE. A 100% PPE usage rule is employed at all times during performance of physical work, unless a written waiver is obtained from the SDR. Visibly post the waiver at the job site or have the waiver in possession during performance of work.
5. The CSSP shall include how the Contractor and Subcontractor disciplinary processes apply to workers who fail to comply with the PPE requirements of the CSSP.

S. Occupational Medicine Program

1. Contractors at all tiers who are on-site for more than 30 work days in a calendar year or have employees who are enrolled for any length of time in a medical or exposure-monitoring program required by 10 CFR 851, Worker Safety and Health Program rule and/or any other applicable federal, state, or local regulation shall have an Occupational Medicine Provider (OMP). Reference Appendix A, "Occupational Medicine Services," for more information.
2. The CSSP shall identify the name of a credentialed provider, including the company name, address, telephone number, and the name of a management contact for their OMP. Complete

SF-4040-DOP, "Declaration of Occupational Medicine Provider." This form is located on the Sandia Corporate Forms website.

T. Emergency Action Plan (EAP) and Event Notification

The CSSP shall identify an EAP that identifies the steps and actions that shall be taken in the case of an emergency while performing work. The EAP shall incorporate the minimum following items:

1. For life-threatening injuries or illnesses, immediately call for medical assistance by dialing 911 on a Sandia telephone or (505) 844-0911 on an outside/cellular telephone at the Albuquerque site. Emergency medical transport is available, 24/7.
   a. Contractors are eligible to arrange for emergency medical transport and first-aid at the Sandia Medical Clinic, 7:30 AM–5:00 PM weekdays. These arrangements must be planned in advance and incorporated in the contractor CSSP and/or workplace safety documents such as an AHA. When considering the use of Sandia Medical Clinic for first-aid contingency planning, be sure to account for the work schedule and the response time of the Sandia paramedics and ambulance services.
   b. The CSSP shall identify the location on-site where medical and non-medical emergency numbers shall be posted. Ensure that all employees are aware of medical and non-medical emergency telephone numbers.

U. The CSSP shall identify the actions required for electrical shock. Accompany any employee that receives an electrical shock above 50V and when a worker is exposed to arc-fault/arc-flash when not wearing the required PPE to the Sandia medical facility (Building 832) during standard working hours for immediate medical attention, no matter how minor the shock appears. During non-standard hours, seek medical attention at an off-site facility. Notify SE or SDR immediately after transporting the individual to Sandia Medical.

1. Transport personnel with non-life-threatening injuries or illnesses that require medical attention to the Contractor's identified medical facility.
2. Notification of Accidents, Injuries, and Illnesses: After calling for emergency support, the Contractor shall contact SE, SCM, SDR, or Sandia Project Manager (SPM) as soon as possible, but not later than 2 hours following the event.
3. All calls must include person-to-person contact (a voice message is not sufficient).
4. Submit form SF 2050-P, *Contractor Report of Occupational Injury/Illness*, to the SDR within three days of the event occurrence.
5. The CSSP shall identify the steps and actions that shall be taken in the case of an unplanned event while performing work.@

V. When the Contractor becomes aware of an event that could adversely impact workers, the public, or the environment, or cause unplanned disruptions of normal operations, the Contractor shall barricade, as appropriate, to ensure workers and pedestrians in the area are not exposed to a hazard and notify SE, SCM, SDR, or SPM of the event (when in doubt, report it). Leaving a message on voicemail or sending a page does not meet this requirement of notification; the Contractor must speak to SE, SCM, SDR, or SPM.

1. When the Contractor becomes aware of any monitoring results that indicate personnel exposure to chemical, biological, or physical hazards are above limits established by OSHA or ACGIH, the Contractor shall notify SE, SCM, SDR, or SPM as soon as possible. Leaving a message on voicemail or sending a page does not meet this requirement of notification; the Contractor must speak to SE, SCM, SDR, or SPM.

NOTE: Ensure barricading is installed as appropriate to provide awareness and protection to workers and pedestrian or vehicle traffic in the vicinity of the event.

W. Accident Scene Preservation

1. Accident scene preservation shall be implemented following any accident or incident event that involves one or more personnel injuries, events that involve emergency or non-emergency notification, and events that activate local emergency response equipment (fire alarms, air monitoring equipment alarms, evacuation signals, and near miss accidents that could have resulted in injuries or damage to Sandia equipment and facilities).
2. The CSSP shall identify the steps the Contractor shall take to ensure the work site is secured and in a safe condition, preserve the accident scene, and meet the following criteria:
   a. Ensure injured personnel have received adequate medical attention.
   b. Ensure hazards are minimized and personnel are not subjected to further injury.
   c. Ensure hazards have been mitigated to ensure protection to the environment and adjacent personnel.
   d. Secure the area and limit entry by personnel by installing barricades, tape, signage, etc.
   e. Unless there is an imminent hazard, do not move equipment, vehicles, and/or materials or alter the accident site.
   f. After medical or rescue services have been summoned (if necessary), immediately contact the SDR, SCM, Sandia Code Inspector (SCI), or SE to communicate the incident. Continue calling Sandia personnel or their management until voice confirmation has been obtained.
   g. If possible, take photographs to document the condition of the scene.
   h. Do not leave the area until the Sandia Area Representative, SE, SCM, or SDR arrives on-site to assume control of the area.

X. Contractor's Industrial Hygiene Program

1. The CSSP shall identify an Industrial Hygiene Program that meets the following criteria:
   a. The requirement to assess worker exposures to hazards to determine the risk of work-related injuries or illness.
   b. Assess worker exposure to chemical, physical, biological, or ergonomic hazards through appropriate workplace monitoring (including personal, area, wipe, and bulk sampling), biological monitoring, and observation.
   c. Monitoring shall be recorded in writing. Documentation shall describe the activities, tasks, and/or locations where monitoring occurred, identify workers monitored or represented by the monitoring, and identify the sampling methods used, duration of monitoring, and control measures in place during monitoring (including the use of PPE). Include any other factors that might have affected sampling results.
   d. The Contractor shall be informed of the precautionary measures that need to be taken to protect workers during normal operating conditions and in foreseeable emergencies; that is, the identification of inherent chemical, physical, biological, or ergonomic hazards in the workplace and the established corresponding control measures through the JSHE process.
2. **General:** Comply with the 2016 edition of the ACGIH threshold limit values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEI) when the ACGIH TLVs and BEIs are lower (more protective) than OSHA permissible exposure limits (PEL).
   a. Contractors must submit a Written Exposure Control Plan for silica exposure that meets the requirements of 29 CFR 1926.1153 (g). Contractors may use the guidance document provided in Appendix E to help guide control selection for silica control plans. If deviations will be made from these recommendations, the controls to be used must be documented in writing and available on-site for review.

b. Applicable OSHA-expanded health standards shall be complied with, even when ACGIH TVLs are used.

3. **Gases, Vapors, Fumes, Dusts, and Mists:** Use engineered, administrative, or PPE controls to keep employee exposures within prescribed limits.
   a. Controls must be evaluated to ensure the appropriate level of protection to the worker.
   b. Potential for exposure to hazardous substances shall be determined by the Contractor's industrial hygiene program.
   c. The Contractor or Contractor's qualified health and safety representative shall identify hazards and select and implement effective controls to ensure worker safety and health. Control measures (e.g., full face air-purifying respirators or local exhaust ventilation) may be required.
   d. No work shall proceed without concurrence with the proposed control measures by the SDR.
   e. Engineering controls equipment, such as local exhaust ventilation devices, shall be appropriate for their use and operated according to manufacturer requirements. This may include incorporation of fire-prevention features for hot work or checking gauges to ensure high-efficiency particulate air (HEPA) filters are operating within the effective range.
4. **Physical Hazards:** This includes noise (sound pressure levels), ergonomics, lasers, non-ionizing radiation, and thermal stress.
   a. Noise, non-ionizing radiation, and thermal stress: Comply with 2016 ACGIH TLVs.
   b. When working in hot environments, promote frequent hydration and taking breaks in cool and shaded locations to reduce thermal stress on the body.
   c. Lasers: Comply with ANSI Z136.1, *Safe Use of Lasers.*
      i.) Class 1, 2, and 3a lasers may be used.
      ii.) Do not use Class 3b or Class 4 lasers without the written approval of the SDR.
      iii.) When used for operations such as leveling floors, roads, and sidewalks, the laser beam shall not be directed above the horizon, through navigable airspace, or toward aircraft ground operations.
      iv.) The laser beam shall be backstopped with a non-reflective surface that is opaque (non-transparent) to the laser's beam.
      v.) All outdoor laser operations other than those described above must be reported to the SDR for approval prior to laser operations being performed.

Y. Excavation Near Known Utilities

The CSSP shall clearly identify the Contractor's means of excavation within 5 ft of known utilities and shall clearly indicate the Contractor's use of Sandia excavation and penetration permits, as required below.

Z. Heavy Equipment Staging

When feasible, heavy equipment should be positioned and maintain a distance of 1 ft away from an excavation trench for each 1 ft of depth. A competent person shall perform an evaluation of current conditions to determine a safe alternate distance.

AA. Pre-Task Planning

1. The PTP is a daily analysis tool for contractors and subcontractors to use to identify hazards and controls associated with the planned scope of work to be performed during the day.
2. The CSSP shall identify the Contractor's process for using PTPs for their work and the work of their subcontractors, as indicated below.

a. Critical thinking shall be used during this part of the analysis. A focus on what could go wrong during the day, such as weather and changes to the process and personnel, need to be evaluated regularly.
b. For work involving multiple tiers of subcontractors, the Subcontractor shall review the authorized scope of work of each PTP to ensure it matches the contractually-authorized scope of work.
c. The PTP shall clearly define the planned scope of work and the sequence of activities needed to complete the planned scope of work.
d. The PTP shall identify the hazards and controls that will or may be encountered while performing planned activities. The PTP shall clearly associate hazards and their corresponding controls with the sequence of activities.
e. The PTP shall include an assessment of fire protection heat-sensitive devices that considers the potential for mechanical damage or heat-activated discharge and a mitigation plan when working in the vicinity of heat-sensitive devices.
f. Special attention should be given to potential hazards not specifically covered in the CSSP and other pre-work planning, newly emerging hazards, or hazards resulting from a change in the scope of work.
g. A PTP shall be implemented daily before physical work begins. Changes in site conditions, personnel or crew changes, changing hazards or the discovery of unexpected hazards, or other items that are different from the initial PTP shall trigger a PTP update, review, or new PTP development.
h. Documents such as checklists or permits, or knowledge (such as training) that identifies and plans for the mitigation of hazards associated with a task, can be referenced. A task is a specific segment of a particular scope of construction work that is time-, condition-, worker-, and/or location-dependent.
i. The PTP shall be developed with participation by all workers on the activity and to ensure a common understanding of the authorized scope of work and how the tasks will be accomplished.
j. The PTP development process should establish a shared accountability for safety among the work team (e.g., “see something, say something”).
k. For time and material contract activities, the contractually authorized scope of work (SOW) shall be attached to the corresponding PTP to ensure the SOW on the PTP is authorized work and is approved by the Contractor Superintendent. Additionally, for time and materials contracts, the Contractor shall conduct oversight and assessment activities to include review and approval of all PTPs prior to initiating construction activities; maintain on-site oversight while construction activities are being performed; and conduct documented daily safety assessments.

BB. Safety Plan Addendum

Before work activity is performed that involves hazards that were not addressed in the original CSSP, submit an addendum to the CSSP in the form of a modification for acceptance.

1. New hazards may result from changes to the scope of work or changes in site conditions.
2. The addendum shall identify mitigation or control for a new hazard as described in the “Contract-Specific Safety Plan” paragraph discussed earlier.
3. An AHA may be used for non-routine activities that are not typically encountered during the course of performing work.

1.7. Jobsite Hazard Evaluation

A. General

1. Sandia personnel will perform an evaluation of the site where work will be performed and provide a summary of hazards that exist in the location that Contractor will need to be aware of when planning work. Examples of pre-existing hazards may include but are not limited to laboratory chemicals, radiological material, asbestos, mold, beryllium, confined spaces, lead, and hazardous operations that are performed in the location (explosions, pulse shots, impacts, etc.).
2. The JSHE is not intended to document construction hazards.
3. A documented JSHE is included with contract documents for construction work.
4. Hazards introduced in performance of work shall be evaluated and mitigated in accordance with existing federal, state, and local regulations, including 29 CFR 1926, 29 CFR 1910, and applicable provisions of this Section.

B. Identified Pre-Existing Conditions

Take precautions for pre-existing conditions identified on the job site, per the JSHE. Do not proceed without full knowledge and understanding of these conditions. If a corresponding description or identified paperwork or permit is not attached for the identified hazard, contact the SDR immediately.

C. Unidentified Hazard

If a hazard is encountered during the performance of work that has not been identified, contact SE or the SDR for specific requirements prior to performing work that might affect the condition or concern.

D. All requirements and recommendations identified in the project-specific JSHE shall be considered part of the CSSP as an attachment, unless an alternate hazard control/mitigation for the identified hazards has been submitted by the Contractor and accepted by the SDR.

1.8. References

A. American Conference of Governmental Industrial Hygienists

Threshold TLVs for Chemical Substances, Physical Agents and Biological Exposure Indices (2016)

B. American National Standards Institute (ANSI)

Number	Title
Z87	Safety Glasses
Z49.1	Sections 4.3 and E4.3 Welding, Cutting, and Allied Processes
Z88.2	Practices for Respiratory Protection
Z89.1	Industrial Head Protection
Z136.1	Safe Use of Lasers
Z358.1	Emergency Eyewash and Shower Standard

C. American Society of Mechanical Engineers (ASME)

Number	Title
B30	Safety Standards for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings

D. Code of Federal Regulations (CFR)

Number	Title
29 CFR 1926	Title 29-Labor, Part 1926-Safety and Health Regulations for Construction
29 CFR 1910	Title 29-Labor, Part 1910-Occupational Safety and Health Standards
10 CFR 851	Worker Safety and Health Program

E. New Mexico Environment Department

Number	Title
NMAC 20.9.2	Title 20 Environmental Protection, Chapter 9 Solid Waste, Part 2 Solid Waste Management General Requirements

F. Environmental Protection Agency (EPA)

Number	Title
832-R-92-005	Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices

G. National Fire Protection Association (NFPA)

Number	Title
70	National Electrical Code
70E	Standard for Electrical Safety Requirements in the Workplace

H. American Society for Testing and Materials (ASTM)

Number	Title
F2413-18	Protective Footwear Standard

PART 2. EXECUTION

2.1. Integrated Safety Management System (ISMS)

A. General

Sandia personnel are committed to performing work safely and ensuring the protection of employees, the public, and the environment. To support these commitments, Sandia personnel employ an ISMS, which provides the framework for this specification, and the requirements established for contracted construction work at Sandia.

B. ISMS Guiding Principles

The following guiding principles are the cornerstone of an effective safety management program:

1. **Contractor Management Responsibility for Safety:** Contractor management is accountable for the protection of the public, workers, and environment.
2. **Clear Roles and Responsibilities:** Clear and unambiguous lines of authority and responsibility for ensuring safety is established and maintained at all organizational levels within the company and its subcontractors.
3. **Competence Commensurate with Responsibilities:** Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.
4. **Balanced Priorities:** Resources are effectively allocated to address safety considerations. Protecting the public, workers, and environment is a priority whenever work is planned and performed.

5. **Identification of Safety Standards and Requirements:** Before work is performed, associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established, which, if properly implemented, provide adequate assurance that the public, workers, and environment are protected from adverse consequences.
6. **Hazard Controls Tailored to Work Being Performed:** Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards.
7. **Operations Authorization:** Conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed upon.

C. Apply the ISMS work cycle shown in Figure 2-1 at the task or activity level for construction assignments. Depending on the size and complexity of the work activity/task, some elements of the work planning phase may not be used formally.

D. Refer to Section I of the Contract for specific requirements for pre-bid visits and conferences. The Contractor has the responsibility to visit the project site and submit questions about ES&H-related issues that may affect Contractor cost or performance prior to bid.

E. Table 2-1 provides requirements for demonstrating effective safety management during the execution phase of this contract.

- **Plan Work:** Contract requirements are translated into work, expectations are set, activities and/or tasks are identified and prioritized, and resources are allocated.
- **Analyze Hazards:** Hazards associated with the work are identified, analyzed, and categorized.
- **Control Hazards:** Applicable standards and requirements are identified. Controls to prevent or mitigate hazards are identified; CSSPs are developed and controls are implemented.
- **Perform Work:** Contractor's readiness to perform contract work is confirmed and work is performed safely.
- **Feedback and Improve:** Feedback information on the adequacy of controls is gathered, opportunities for improving the definition of planning of work are identified and implemented, oversight is conducted, and when necessary, controls are modified to ensure a safe work environment.

Figure 2-1. ISMS Work Cycle

Table 2-1. Engineered Safety and ISMS Contractor Requirements

Work Cycle Phase	Contractor Requirements	Expectations
Plan Work		
Review of Sandia Job Site Hazard Evaluation Checklist	Understand existing conditions and controls that might affect worker safety and health.	Contractor will review JSHE and incorporate existing site hazards and controls into its CSSP.
Prebid Site Visit and Review Design Intent	Identify potential job and site hazards and hazard combinations.	Contractor will review its potential hazards and determine the effect on existing Sandia hazards. Contractor will document how the combination of hazards will be controlled in its CSSP.
Prebid Conference	Resolve emergency-preparedness responsibilities and other safety issues not identified in Request for Quote.	Contractor will identify emergency action plan and document it in the CSSP.
Bid Submission	Commit adequate level of resources for job conditions.	Contractor will ensure adequate competency and level of resources are available and provided as submitted in bid.
Analyze Hazards		
Job Safety Analysis and Risk Assessment Approach	Evaluate job-specific activity/task and site-specific work requirements and hazards.	Contractor will review work requirements and hazard controls. Task hazard analysis shall be performed for high-hazard tasks (e.g., confined-space entry, critical lifts, hot work, excavation, penetration, energized electrical work, or respiratory protection). Ensure estimates of low probability of occurrence do not dominate early decision-making since human nature and external pressures tend to minimize the use of what would otherwise be sensible controls based on the severity of accident consequences.
Sandia Hazard Information	Request and incorporate hazard identification and hazard control information supplied by Sandia personnel.	Contractor will ensure that information from the JSHE is incorporated into its CSSP.
Job Task Analysis and Understanding the Technical Basis	Resolve job assignment and personnel fitness issues.	Contractor will ensure that workers have the appropriate training and skills for assigned tasks. The technical basis of an existing hazardous activity must be reconstructed sufficiently to ensure continued safe operations. The effort will be prioritized according to the severity of potential accident consequences.

Work Cycle Phase	Contractor Requirements	Expectations
Pre-work Evaluation of Subcontractor Work Team	Evaluate Subcontractor work group's knowledge of CSSP safety requirements applicable to their work and how the requirements will be implemented.	Contractor will ensure that Subcontractor workers have the appropriate awareness of the CSSP safety requirements and can demonstrate how they will be implemented for assigned task
Control Hazards		
Safety Program and Define Unacceptable Consequences	Identify company safety management policies, processes, and procedures. Ensure there are clear responsibilities for accepting and suspending work.	Contractor's Safety Program will be complete and contain its company-specific safety information. Unacceptable consequences include the following: • Accidents that result in a serious occupational injury • Significant violation of environmental regulations • Unplanned facility outages or interruptions that significantly impact critical mission work
CSSP – Identify and Control Hazards	Address all contract-specific safety requirements and protective measures, including combined requirements and combined controls.	The CSSP will incorporate company-specific information from the company safety program as well as contract-specific requirements. The CSSP will document how the combination of company-specific hazards and contract-specific hazards will be controlled. The Subcontractor's addenda will be incorporated into the Contractor's CSSP. The CSSP will identify methods used by the Contractor to perform oversight and self-assessment of compliance with the CSSP.
Preconstruction Meeting (as appropriate)	Participate in preconstruction meeting with intent of understanding conditions/restrictions identified on the hazard evaluation checklist.	The Contractor, subcontractors, and workers are aware of their responsibility to review the Contractor's safety program and CSSP prior to the start of work and as needed.
Hazard Awareness and Identifying and Controlling Energy Sources	Ensure employees, subcontractors, and suppliers are informed of foreseeable hazards and protective measures associated with work activities, as appropriate, prior to initiating work. Ensure Superintendent is qualified and has knowledge of the CSSP and contract requirements.	Supervisors are responsible for ensuring that work activities, work hazards, and work controls are clearly linked and flow down to all workers regardless of tier through documented training, safety meetings, toolbox talks, and pre-task meetings. For all high-risk work, the Contractor shall submit PTPs to Sandia personnel for daily review and approval as scope changes.

Work Cycle Phase	Contractor Requirements	Expectations
		For projects that involve high-risk work, the Contractor shall submit evidence to Sandia of the review of superintendent qualifications, ensuring they have knowledge of the CSSP and contract requirements for safe execution of activity-level work. If a superintendent is changed during a project, the Contractor shall resubmit evidence of superintendent qualification for Sandia review. For all high-risk projects, the contractor Project Construction Hazards Checklist and Safety Acknowledgement Form shall state that the Contractor will have a Contractor Safety Representative or delegate present the following topics at the pre-construction meeting: 1. A detailed list of activities that constitute the scope of the project. Emphasize that for any change in scope, the change may not be started until approved by SE. 2. When to pause or stop work, including pause/stop for scope changes. 3. The specific sections of the CSSP that apply to the project. 4. The high-risk activities to be performed during the project. 5. The PTP form, PTP requirements, and expectations for PTP use. Subcontractors and their workers will be knowledgeable about the Contractor's CSSP. Workers attend documented safety meetings, toolbox talks, and pre-task meetings as required; positive verification is required. Workers are familiar with the hazards and work controls that result in safe working conditions. Stored energy must be identified and controlled with appropriate engineered and administrative controls designed to prevent or mitigate the consequences of accidental release. Kinetic, potential, electrical, electro-mechanical, thermal, pressure, and chemical are examples of energy sources that can be released directly or in another form as the result of an accident.

Work Cycle Phase	Contractor Requirements	Expectations
Work Authorization	Ensure that safety plans/corrective action plans are reviewed, and work is authorized prior to initiating work or corrective actions.	The Contractor will obtain and follow all permits as required by Sandia personnel. Permit information will be flowed down to subcontractors and affected workers during documented toolbox talks, PTPs, and safety meetings. Corrective actions will be completed as required.
Perform Work		
Job Supervision and Positive Verification	Ensure that Contractor management provides appropriate safety supervision to all workers at all times.	Supervisors assume responsibility for the safety of the work site and workers. When unanticipated hazards or environmental risks are introduced, work will be paused until revised work planning, hazards, and environmental effects are analyzed and any additional controls are documented and approved, as appropriate. Positive verification requires that each team member affirm to the person in charge that their part of the system is in the state intended for safe operation. This can be done during pre-task analysis for less complex operations. If the team does not have concurrence, it should be assumed by the person in charge that it is not safe to proceed.
Safety Inspections	Conduct and document daily workplace inspections, with or without Sandia personnel, to identify and correct hazardous conditions and instances of non-compliance with safety plan/requirements.	Supervisors are responsible for ensuring that daily inspections are documented, and immediate action is taken for all identified non-compliance issues.
Emergency Response	Ensure that all personnel at the work site can recognize abnormal or unsafe conditions and know how to respond (e.g., “what-if scenarios”).	Train workers to recognize abnormal or unsafe conditions and understand how to respond to the conditions by controlling and reporting the condition. Every worker understands they have the responsibility and authority to suspend an activity/task if the worker believes it presents an imminent danger.
Corrective Actions	Implement interim controls for unsafe or abnormal conditions, including notification to workers and SDR.	The Contractor has controls in place to immediately address unsafe or abnormal conditions.

Work Cycle Phase	Contractor Requirements	Expectations
Feedback and Improve		
Self-Assessment	Identify opportunities for safety process and work performance improvements.	The Contractor will review daily inspection reports, lessons learned, and injury/illness reports to identify areas that require improvement.
Performance Reviews	Discuss performance strengths and weaknesses with employees and subcontractors.	Information on strengths and weaknesses will flow down to subcontractors and workers.
Assessment of Pre-Task Plans	Review and discuss the quality and effectiveness of in-process and completed PTPs with employees and subcontractors.	The Contractor will review Subcontractor pre-work assessments, PTPs, etc., to determine if CSSP requirements are communicated to Subcontractor personnel.
Sandia Feedback	Communicate suggestions for Sandia improvements to the SDR.	The Contractor will provide updated information and/or suggestions to the SDR that will add value to ongoing improvement programs. The Contractor will provide a means for workers to report unidentified or uncontrolled workplace hazards.

2.2. Worksite Identification

A. Construction Bulletin Board

Provide and maintain a weather-tight safety bulletin board in a visible location. The bulletin board shall be used only to post official announcements.

1. For projects under $50,000, provide and maintain a legible, durable, and weatherproof 8 ½-in. by 11-in. sign in a visible location with the following information:
   a. Company Name
   b. Superintendent Name
   c. After-Hours Telephone Number
   d. Sandia Contract Number
   e. Sandia Contact Name and Telephone Number
   f. DOE-designated Worker Protection Poster
2. For projects over $50,000, in addition to the information required above the bulletin board, it shall also include all items required on the Sandia.gov website (www.sandia.gov/working-with-sandia/current-suppliers/construction-and-facilites/)

2.3. Hazard Identification Signage and Barricades

A. Provide appropriate hazard identification as identified in the CSSP. These signs and barricades must be used to protect construction employees from potential hazards or risk exposures.

2.4. Safety Site Documentation

A. The Contractor shall keep a copy of the following approved documentation on the project work site: CSSP, AHA, JSHE, safety data sheets (SDS), PTP, plans, specifications, and any additional project-specific work planning documents required to plan and control foreseeable hazards on the project.

B. Documentation shall be available to subcontractors, safety engineers, and Sandia construction safety personnel.

C. Documentation demonstrating personnel have received training on the CSSP to ensure all affected personnel are informed of foreseeable hazards, and the requirement to follow protective measures, shall be maintained at the Contractor's office and furnished upon request of the SDR.

2.5. Coordination of Work Affecting Ongoing Sandia Operations

A. Overhead Work

1. Schedule work required to be performed above occupied areas for non-standard hours, unless specific and approved precautions, including signage, barricades, occupant consent, and any other precaution deemed necessary by Sandia, is provided 2 weeks in advance of operation.
2. Final approval for work in occupied areas during normal work hours must be received from the SDR.

B. Utility or System Outages

Submit an Outage Request Worksheet in advance of activity/task requiring utility or equipment shutdowns that affect ongoing Sandia operations, observing the advance-notice requirements noted on the worksheet.

C. Construction Site Illumination Requirements

Construction areas, ramps, runways, corridors, offices, shops, and storage areas shall be lighted in accordance with 1926.56 requirements.

D. Removal of Administrative Tags

1. Sandia personnel may use locks and/or tags to prevent unauthorized use of or access to equipment or systems. These locks and/or tags are not used for LOTO purposes (protection during the maintenance and servicing of equipment).
2. The Contractor shall obtain permission from the SCI prior to removing any administrative lock and/or tag.

E. Use of Sandia-Owned Equipment or Personnel for Contracted Activities

1. When Sandia-owned or -operated equipment or Sandia personnel are used in the execution of Contractor construction activities, a formal written job plan authorized by the Sandia SDR, Sandia Facilities management, and other involved Sandia management is required.
2. The job plan shall identify oversight requirements when joint activities are conducted.
3. Job plans shall be submitted to the SDR for review and approval.

2.6. Medical/Health Protection

See Appendix A.

2.7. General Project Work Practices

A. Significant Hazards

1. Significant hazards and activities including those defined as high-risk work that require a documented safety briefing, AHA, or both are listed in this section. Examples of documentation include but are not limited to the following:
   - CSSP
   - AHA
   - Permits
   - JSHE
2. Contractors will ensure that work is conducted by qualified and trained workers. When applicable, activities will be conducted by workers who are certified, registered, or otherwise documented as qualified by their trade/profession, or who are licensed to perform that activity by the appropriate government organization.
3. JSHEs or AHAs and permits, such as confined space and radiological work, further address Sandia-specific qualifications and training required for high-risk or high-rigor activities.
4. Work control is built into numerous Facilities processes—for example, CSSP review, pre-job and other scheduled meetings, building permits, additional permits, such as hot work, and code and safety inspection by Facilities staff.
5. Feedback on Facilities construction activities is provided to contractors by several means, such as immediate, on-scene feedback by inspectors, quarterly meetings, and the monthly newsletter.
6. A focus on the potential consequence and severity for work is required. Oftentimes, significant risk is overlooked because personnel are frequently around the hazards and become familiar with the activity, which can give a false sense of safety.
7. Damaged or malfunctioning tools shall be taken out of service and tagged to avoid the usage by another worker.

8. Attention to potential and kinetic energy is required for proper hazard analysis.

B. Hidden Hazards Penetration

1. General: Sandia personnel have adopted a five-step approach to minimize the effects of hidden hazards when performing penetration or excavation operations. This process includes the following: (1) drawing review; (2) site investigation; (3) detection using instrumentation, as appropriate; (4) use of appropriate tools; and (5) PPE.
2. When removing concrete flooring systems located within a building or performing roof evaluations, follow the five-step approach prior to beginning removal work of the concrete floor.
3. Workers engaging in excavation or penetration operations shall use tools that are in good working condition and shall use PPE, electrically-rated gloves (wearing rubber gloves for shock protection and leather protectors worn over the rubber gloves), ground-fault circuit interrupter (GFCI) protection, and double-insulated tools, as appropriate and when required for the hazard.
4. To mitigate risk, the Contractor shall ensure that adequate site investigation, using methods that would not penetrate hidden hazards (e.g., visual inspection or detection using instrumentation), is performed prior to any excavation or penetration operation. If hidden hazards cannot be identified through site investigation, the SDR shall be notified prior to excavation or penetration operations, and appropriate PPE shall be worn when performing excavation or penetration operations. (See below for excavation and penetration permit requirements.)
    a. Ground penetrating radar (GPR) is available for assessing proposed penetrations.
    b. Wall, floor, ceiling, and roof verification: Removal of energy sources or hazardous gases that pass through wall/floor/ceiling systems require a 100% positive verification prior to cutting the energy source or hazardous gas on the opposite side of the wall/floor/ceiling. (A sleeve that is pushed through the system or the dismantling of a conduit are examples of positive means of verification.)

C. Excavation Permit

1. Obtain an excavation permit prior to the start of the operations listed below.
    a. Excavation operations that include digging, saw-cutting, or demolition of asphalt pavement beyond a depth of 12 in. Excavation operations that include drilling, coring, or trenching into soil beyond a depth of 12 in. exterior to a building footprint.
    b. Excavation of soil beneath interior slabs regardless of depth.
    c. Scraping or blading of any area to a depth greater than 12 in. exterior to a building footprint.
    d. Driving any object (fence post, survey marker, ground rod, concrete pin, etc.) to a depth greater than 12 in.
    e. Scraping, blading, or excavation of any area undisturbed or appearing to be undisturbed, such as areas covered with native vegetation, and blading or improvements to previously unimproved roads or paths regardless of depth.

D. Demolition, saw-cutting, or core drilling of concrete structures, concrete steps, ramps, pads, sidewalks, or slabs outside a building footprint ***regardless of depth***. Does not include removal of asphalt paving outside a building footprint to a depth of less than 12 in.

E. Any pothole, regardless of diameter, shall be continuously attended during active work and immediately protected when unattended.

NOTE: Ground penetrating radar scans are generally not done outside a building footprint but may be requested for areas where it is suspected that ice melt systems or other embedded objects may be present.

NOTE: An Air Force Dig Permit (AF-103) is required for all operations that involve a ground disturbance beyond a depth of 4 in. in all areas outside DOE-owned property to include all facilities in Land Use Permit Areas (areas outside Tech Areas I, II, III, IV, and the westerly portion of TA-V). Contact the Sandia Utility Coordinator for assistance with Air Force Dig Permit requests.

NOTE: Before backfilling, call 505-283-4477 for GPS.

F. The area to be excavated shall be shown on the site drawing that is included with the excavation permit request and clearly identified in the field using white paint, flags, whiskers, or stakes (white lines). Submit permit requests at least 21 days prior to start of excavation activities and after the area to be excavated has been identified in the field.

G. Submit a written AHA for all penetration or excavation permit requests that include duct bank penetrations, electric manhole penetrations, and/or any other excavations anticipated to have a high-voltage or other high-risk hazard present. Hand-digging or using methods that would not penetrate hidden hazards to include hydro excavating in most cases do not require an AHA. Evaluate all operations to identify all hazards and the need for an AHA, even when using the methods above.

H. Submit completed excavation permits to the entity account (digpermits@sandia.gov).

1. The excavation permit process involves environmental, cultural, and ecological site review to determine if environmental site impacts will occur due to excavation operations.
2. Confine excavation operations to those areas identified on the site drawing that is included with the permit request and marked on the ground.
3. Physically locate all marked underground utilities falling within 5 ft of the proposed excavation by hand digging or using methods that would not penetrate hidden hazards (using the appropriate tool and force to ensure minimal or no impact to the utilities). Once all known utilities have been physically located, normal excavation methods may be used. The evaluation of what tool/force to use will consider potential materials such as poly, ductile iron, polyvinyl chloride (PVC), or concrete; the soil type; and the depth of potential utility. Consider these factors when matching the selection of tools and force to ensure minimal or no impact to the utilities.
4. The permit evaluation will consider potential materials such as poly, ductile iron, PVC, or concrete; the soil type; and the depth of potential utility. Consider these factors when matching the selection of tools and force to ensure minimal or no impact to the utilities.
5. Ensure that the original excavation permit containing all the required signatures and all attachments is in the possession of the Excavator before and during the performance of all excavation operations that require a permit. The original excavation permit (or a copy thereof) shall also be in the possession of all subcontractors before and during the performance of all excavation operations that require a permit. No excavation operations shall take place after the expiration date on the permit.

6. Excavator shall be responsible for maintaining the Locator's marks after the permit has been issued. The Excavator shall also maintain markings identifying the proposed excavation area (white lines) after the permit has been issued.
7. Excavator must suspend work if excavation conditions change or are not consistent with the excavation permit and attachments. If the original scope of work changes, resulting in additional work being required outside the original white line limits, Excavator must begin the permit process again to acquire a new permit. Exceptions may be granted in cases where the original underground utilities were marked outside the original white-line limits and include the area where the additional work will take place.
8. A long duration permit is applicable to excavation projects greater than 3 months in duration. Long duration permits are excavation permits that require the Contractor and Code Inspector to maintain the log sheet attached to all permits, in order to demonstrate that utility spotting has been maintained and is still suitable for all ongoing construction activities. For all long duration permits, the Supervisor Authorizing Excavation, in coordination with the Excavation Coordinator, is required to maintain the Long Duration Excavation Permit Log Sheet every 30 calendar days or the permit will expire, and the Excavator must begin the permit process again to acquire a new permit. The 30-day requirement starts from the date the permit was originally signed by the Supervisor Authorizing Excavation.
9. The Supervisor Authorizing Excavation and the Excavator shall perform a site investigation before performing excavation activities to ensure that work will be performed safely. If work is to be completed by a Subcontractor, the Supervisor Authorizing Excavation for the Prime Contractor shall perform a site investigation with the Subcontractor Foreman and/or Superintendent prior to performing excavation activities to ensure that work will be performed safely, to review all Locator's marks, and to ensure that the Subcontractor has a copy of the current excavation permit on hand at all times while conducting work. The Foreman and/or Superintendent of the Subcontractor shall be present at all times while excavation activities are being performed. The above "hand off" requirement will also apply whenever there is a change in the site Foreman/Superintendent for the Prime Contractor. Use SF-2001-EP (FRM-047), *Excavation Permit,* to request a site review to excavate.

I. Penetration Permit

1. Obtain penetration permit prior to the start of the following operations:
   a. Penetration of pads, slabs, floors, walls, ceilings, vaults, and roofs beyond a depth greater than 2 in. (includes precast concrete) inside a building footprint.
   b. For concrete masonry unit (CMU) walls and ceramic block walls, an exploratory drill hole is permitted to determine whether the blocks are filled or hollow using methods that would not penetrate hidden hazards.
   c. Core drilling and saw-cutting through filled CMU or ceramic block walls.
   d. Penetrations (e.g., chipping, grinding, jack-hammering, core drilling) into any underground concrete duct bank, manhole, utility vault, or other concrete structure where potential high-voltage or other high-risk hazards may exist.
   e. Removal of grout over electrical floor ducts regardless of depth.
   f. Penetrations where site investigation cannot possibly identify hidden hazards.
2. A penetration permit is not required for the demolition of, saw-cutting of, or core drilling through hollow CMU walls, hollow ceramic block walls, drywall, or other framed type construction where a pilot hole can be drilled using methods that would not penetrate hidden hazards to allow a visual inspection of any hidden hazards.
3. A penetration permit is not required for drilling or cutting through metal roof decking where the removal of roofing material, using methods that would not penetrate hidden hazards, will allow for the visual inspection of both sides of the deck. A penetration permit is required for

roof penetrations where a layer of concrete is present over the metal deck. A penetration permit is not required to remove flexible roofing material (i.e., TPO). Extreme caution should be taken when removing thermoplastic polyolefin (TPO) using mechanical means if electrical conduits are present that may run between the TPO and the roof deck.

4. As a safety factor, no penetrations will be allowed within 1 in. of the center of any marked anomaly where mitigations such as utility outages have not been implemented.
5. If high-voltage or other high-risk hazards are identified on the penetration permit, the Requester shall ensure the following:
   a. Develop a task-specific (each penetration is considered a separate task) written step-by-step procedure to be included in the AHA.
   b. Submit the procedure to the AHA to SE for review and approval by SE.

J. The Requester shall schedule an on-site pre-task meeting to review the AHA before any penetration activities are performed. The pre-task meeting includes, at a minimum, the personnel performing the penetration, the Supervisor Authorizing Penetration, SE, the Sandia High-Voltage Team Leader (for all permit requests involving high-voltage hazards), and the appropriate Facilities Operations Engineer as appropriate, as well as the SCI assigned to the project.

K. The area to be penetrated shall be shown on the site drawing that is included with the penetration permit request and clearly identified in the field using white paint, magic marker, or tape. Submit permit requests at least 30 days prior to start of penetration activities and after the area to be penetrated has been identified in the field. Submit completed permit requests to the entity account (digpermits@sandia.gov).

L. Penetrator will review permit and construction site and will follow all comments provided by the Facilities Operations Engineer and Safety Engineering. Proceed with core drill by maintaining a 1-in. clearance on both sides of all marked anomalies. Do not drill on marks or within 1 in. of the center lines. Follow all comments provided by the Facilities Operations Engineer and Safety Engineer, including any recommended clearances from marked power if an outage is not recommended.

1. If a saw cut or other penetration types are required where it will be impossible to avoid intersecting marked anomalies, an electrical outage request may be submitted concurrently with the permit provided the request is for a full building outage.
2. Permits are task specific. Confine penetration to those areas identified on the permit and marked in the field.
3. Ensure that the original penetration permit containing all the required signatures and all attachments is in the possession of the Penetrator before and during the performance of all penetration operations that require a permit. The original penetration permit (or a copy thereof) shall also be in the possession of all subcontractors before and during the performance of all penetration operations that require a permit. No penetration operations shall take place after the expiration date on the permit.
4. Penetrator must suspend work if penetration conditions change or are not consistent with the penetration permit and attachments. If the original scope of work changes, resulting in additional work being required outside the original white line limits, Penetrator must begin the permit process again to acquire a new permit.
5. The Supervisor Authorizing Penetration and Penetrator shall perform a site investigation before performing penetration activities to ensure that work will be performed safely. If work is to be completed by a Subcontractor, the Supervisor Authorizing Penetration for the Prime Contractor shall perform a site investigation with the Subcontractor Foreman and/or Superintendent prior to performing penetration activities to ensure that work will be performed safely, to review all Locator's marks/anomalies, and to ensure that the Subcontractor has a copy of the current penetration permit on hand at all times while

conducting work. The Foreman and/or Superintendent of the Subcontractor shall be present at all times while penetration activities are being performed. The above "hand off" requirement will also apply whenever there is a change in the Site Foreman/Superintendent for the Prime Contractor.

6. Use Penetration Permit SF 6610-PP (Facilities FRM-103) to request a site review to penetrate.

M. Fire Safety

All construction operations in new and existing facilities shall, at a minimum, follow the requirements set forth in the International Fire Code (IFC) (ANSI Z49.1, Sections 4.3 and E4.3) and include the following:

1. Emergency vehicle access shall be provided as follows:
   a. Minimum 20-ft-wide vehicle pathway
   b. Must support weight of fire apparatus (75,000 lbs.)
   c. Minimum 13-ft, 6-in. vertical clearance
2. A water supply for firefighting must be provided (either fire hydrants or water tanks of sufficient capacity shall be available on-site).
3. Access to fire hydrants:
   a. Fire department inlet connections or fire protection system control valves shall not be hampered.
   b. A minimum 3-ft clearance must be maintained around fire hydrants.
   c. Storage, vehicles, trash, or other materials or objects shall not be placed or kept near fire hydrants, fire department inlet connections, or fire protection system control valves.
   d. Any temporary fencing installed near fire hydrants or fire protection equipment shall be provided with a gate to allow emergency access.
4. Housekeeping: Construction debris and trash shall be removed at least once per day at the end of the shift or more frequently if necessary.
5. Flammable and combustible materials shall be stored in accordance with the IFC. These materials may not be stored near existing facilities, egress routes, emergency vehicle access points, or fire protection equipment.
6. Fire Protection Impairment Permit (FPIP):
   a. Notify the SCI if work will impair or inadvertently activate a fire protection detection or suppression system already in service.
   b. The Contractor shall submit an FPIP for any fire protection system impairments.
   c. Reference standard construction specification Section 28 31 11, "Fire Alarm Systems," for temporary signage requirements.
   d. Reference standard construction specification Section 21 13 13, "Automatic Sprinklers," for fire suppression system impairments.

N. Hot Work Permit

If the hot work will be performed inside a facility to include under awnings, extended roof lines, etc., the Requester will also prepare FRM-058, *Fire Protection Impairment Permit (FPIP)*. If there is doubt as to whether an FPIP is required, the Requester should submit the FPIP for Dept. 4924 to evaluate if the impairment is required to support the planned hot work. Requests for fire protection impairments require 14 days to process and may hold up a hot work permit.

Prior to cutting, welding, open flame roofing, soldering, torch/plasma cutting, grinding, blazing or use of tar kettles, obtain a hot work permit from Sandia. Display the issued permits in a prominent location at the work site.

1. Prior to receiving a site-specific hot work permit, and annually thereafter, operators responsible for performing the hot work and personnel responsible for performing fire-watch duties shall view the training videos and read the accompanying literature provided by Fire Protection Engineering. These videos are approximately 1 hour in combined length.
2. The operators responsible for performing the hot work and the personnel responsible for performing the fire-watch duties shall be trained in the use of portable fire extinguishers annually and shall have demonstrated proficiency through certification.
3. Hot-work operations shall be suspended if in an area where a fire suppression system is impaired.
4. A contractor-furnished Fire Watch shall be provided during hot-work operations and shall continue for a minimum of 1 hour after the conclusion of the work.
    a. Fire Protection Engineering or the SDR is authorized to extend the time required for the Fire Watch based on the hazards or work being performed (such as tar-kettle roofing operations).
    b. The Fire Watch shall include the entire hot-work area.
    c. Hot work conducted in areas with vertical or horizontal fire exposures that are not observable by a single individual shall have additional personnel assigned to Fire Watches to ensure that exposed areas are monitored.
    d. Individuals assigned to Fire-Watch duty shall be responsible for the safety of the welders in addition to that of the property, extinguishing spot fires, and communicating an alarm.
    e. Individuals assigned Fire-Watch duties must remain in the hot work area until hot work is completed and for 1 hour afterwards and shall not have any other duties (e.g., not a runner).
5. The Operator shall ensure that Fire Watch is present prior to beginning hot-work activities. If the Operator is found to be performing hot-work activities without the Fire Watch present, the Operator forfeits the active hot work permit, and their supervisor must apply for a new permit.
6. The Operator (if no Fire Watch is required) shall perform a final area inspection, sign the hot work permit, and return the permit to the SDR.
7. The Fire Watch shall be present while the Operator is performing hot-work activities at all times. The Fire Watch shall not perform any additional tasks while on duty. If the Fire Watch is found delinquent in their duties, they forfeit the active hot work permit, and the Supervisor must apply for a new permit.
8. The Fire Watch shall perform a final area inspection, sign the hot work permit, and return the permit to the SDR.

O. Fire Protection System Impairments

1. Only Sandia Fire Protection personnel are authorized to place active fire protection equipment in an impaired state.
2. Do not assume that an impaired fire protection system with an approved FPIP is in a condition that is safe for performing work.
3. If electrical or mechanical isolation is required to perform work, Sandia Fire Protection personnel will operate breakers or valves to set the isolation.
4. It is the responsibility of the person performing work to verify that proper isolation is in place prior to beginning any work on the system.
5. When performing any work activity or task that affects the operation or functioning of a fire protection system (fire alarm and fire suppression systems), either directly or indirectly, the following actions shall be taken:

a. **Fire Protection Impairment Permit:** Prior to performing any work that generates heat, smoke, fumes, or dust (e.g., welding or cutting drywall) or when modifying or disrupting a fire protection system, complete and submit an FPIP to the SCI to request an impairment.
b. Include an assessment of fire protection heat-sensitive devices that considers the potential for mechanical damage or heat-activated discharge and a mitigation plan when working in the vicinity of heat-sensitive devices. This assessment/mitigation plan must be documented in the PTP.
c. Obtain the FPIP form from the Sandia Contractor Hub.
d. Complete the FPIP and submit it to the Construction Manager (CM) for review and approval.
e. The Work Description portion of the FPIP must include all work that will be performed while the system is impaired. If additional work is added after the FPIP is issued, either an additional FPIP that covers the additional work description must be approved (in which case there will be more than one active FPIP for the system) or a new FPIP that includes the entire work description must be approved and the original FPIP closed. This administrative procedure is necessary to ensure that all work is covered by an active FPIP.
f. Upon submission of the FPIP form by the CM to Sandia Fire Protection, allow a minimum of 14 days for approval.
g. Impairment requests may be canceled if the person performing work is not present at the building fire alarm control panel within 15 minutes of the impairment scheduled start time. The person performing work is required to sign Section 3 of the FPIP in the "Impairment Requestor" block and verify that the "Work Description" block of the FPIP includes all planned work.

6. **Putting a Building Fire Alarm System on "NO ACTION":** A fire alarm system put on "NO ACTION" operates in a standalone mode and does not transmit fire alarm signals to emergency responder workstations. Listed below are the requirements for placing a building on "NO ACTION" status:
   a. Submit the FPIP form to the CM requesting impairment.
   b. The FPIP Requester or Designee shall remain in the impaired building for the duration of the "NO ACTION" to function as a Fire Watch to call 911 in an actual fire.
   c. If the "NO ACTION" extends into non-standard work hours, post signs at each ground-level building exit door informing building occupants that the fire alarm system is not in operation and to call 911 in case of fire. A Fire Watch is required during non-standard work hours.
7. **Disabling Fire Alarm Devices and Zones:** Fire alarm devices and zones are frequently disabled (blocked out) to prevent accidental activation while performing work or to allow modification to occur on a fire alarm system. Listed below are the requirements for disabling fire alarm system devices or zones:
   a. Submit the FPIP form to the CM requesting impairment.
   b. The FPIP Requester or Designee shall remain at the fire alarm control panel whenever notification appliance circuits (NAC) are disabled to restore operation of the NACs if an actual alarm occurs that requires building occupants to be evacuated. In Building 858 and at Technical Area V, Sandia personnel are required to stay at the panel while the NACs are disabled.
   c. For manual pull stations that are non-operational because they are disabled or part of new construction, place a sign over the pull station stating, "OUT OF SERVICE."

d. If the fire alarm control panel will be non-operational during non-standard work hours, post signs at each ground-level building exit door informing building occupants that the fire alarm system is not in operation and to call 911 in case of fire. A Fire Watch is required during non-standard work hours.

P. Fugitive Dust Control Permit

Activities that disturb more than 3/4 acres of soil and/or demolish more than 75,000 ft^3 of building space must comply with 20.11.20 NMAC and obtain a Fugitive Dust Control Permit issued by the City of Albuquerque.

Q. Storm Water Control

1. All earthwork operations shall include mitigation items such as waddles, bales, inlet protection, etc., to minimize stormwater pollution and soil erosion. Mitigation measures shall be inspected and repaired throughout the life of the project.
2. For construction sites greater than 1 acre, follow all requirements identified in the Sandia-furnished SWPPP. This system addresses sediment control and other possible storm-water effects.
3. Contractors shall report spills and accidental releases to the ground surface or the storm drain system immediately to the SDR.

R. Earth Fill and Borrow Areas

1. Project-specific fill and borrow areas shall not be near or on underground or aboveground utilities.
2. If the Contractor has written authorization from the SPM or contract documents to use a designated borrow or fill area in a location other than the project site, the Contractor shall do the following:
   a. If the designated area is located within the boundaries of a project site controlled by another Contractor, the visiting Contractor shall coordinate access with the controlling project site Contractor and comply with all requirements for that site.
3. Obtain the required Fugitive Dust Control Permit through the SDR prior to disturbing the soil.

S. Bird Nesting Sites

Bird nesting sites are not to be disturbed. If nesting sites are discovered during the course of operations, contact the SCI for further direction.

T. Paved and Graded Roads

Contractors shall keep vehicles on paved or graded roads at all times unless prior approval has been obtained to travel into previously undisturbed areas.

U. Sanitary Sewer Discharge

1. Notify the SDR of planned discharges to the sanitary sewer system, other than routine sewage, prior to discharge.
2. The SDR will review the planned discharge and coordinate authorization from the Sandia Water Quality organization.
3. Report spills and accidental releases to the sanitary sewer system immediately to the SDR.

V. Surface Discharge

1. Notify the SDR of planned surface discharges prior to discharge.
2. The SDR reviews the planned discharge and coordinates authorization from the Sandia Water Quality organization.
3. Report spills and accidental releases immediately to the SDR.

W. Underground Storage Tanks

1. Underground storage tank (UST) installation and maintenance operations shall comply with New Mexico Environment Department (NMED), UST Bureau requirements.
2. The NMED UST Bureau-Certified Contractor shall perform work activities/tasks on USTs.
3. If an unanticipated UST is discovered during construction operations, notify SE.

X. Contractor's Staging Area

1. The SDR shall approve staging area locations prior to use.
2. Stored vehicles and equipment, intended for use on Sandia property, shall be in serviceable and safe operating condition.
3. Tag as out of service, then repair or remove defective or unsafe equipment from Sandia property until proper repairs are completed.
4. The staging area shall not be used for storage of hazardous materials not intended for timely use (within 30 days) for work activity.
5. Remove or dispose of excess hazardous material in accordance with Paragraph 1.6O, "Waste Management and Disposal" paragraph.

Y. Temporary Buildings/Storage Areas

Obtain approval from the SDR for location of temporary buildings and storage areas prior to scheduled delivery of building or material.

Z. Hoisting, Rigging, and Load Handling

This section applies to all hoisting and rigging lifting operations involving but not limited to chain falls, bridge cranes, mobile cranes, forklifts, and all-terrain lifts.

1. Adhere to DOE-STD-1090-2020 during hoisting and rigging operations.
2. Perform a proper hazard analysis for all hoisting activities on a graded approach and in concurrence with Sandia.
3. The Contractor shall submit a lift plan for all planned hoisting and rigging lifting operations 10 working days in advance of the operation.
4. The SDR or SDR-appointed person shall determine if the lift is considered Ordinary or Critical per DOE STD-1090-2020.
5. Hoisting and rigging operations for all lifts require a competent person (Lift Director), who shall be present at the lift site during the entire lifting operation. If only one person is making the lift, that person assumes all responsibilities of the Lift Director. The Lift Director shall have the necessary knowledge, training, and experience of the specific type of equipment and assigned lifting operations. All critical lift classification forms, critical lift plans, documented ordinary lift plans requiring special consideration, and associated procedures, technical analyses, and inspection/load test reports shall be retained by the Contractor for a minimum of 2 years.
6. Mobile Cranes: All crane lifts require documented review and approval. Temporary structures (cranes) exceeding > 200 ft above ground level require Federal Aviation Administration notification/approval. **(See Paragraph 2.7.AA.10, "Critical Lift Requirements," for additional guidance.)**

AA. Notify the SCM and SCI 48 hours in advance of the scheduled mobile crane site arrival time and arrange for a Facilities crane inspection. Submit information to the entity account: cranenotice48@sandia.gov.

1. The crane inspection shall include but not be limited to verification of license or training; load charts; inspection reports; and physical verification of ropes, slings, undercarriage, outriggers, and boom.

2. The SCI shall document the review of crane placement and lifting plan or sequence with the Contractor and Contractor's Crane Operator, as appropriate.
3. Review the site for underground utility vaults.
4. Buildings or affected parts of the buildings shall be evacuated prior to lifts; this shall be conducted in conjunction with the Sandia construction team.
5. Provide proof of inspection and load tests for all crane equipment in accordance with 29 CFR 1926 and ASME B30 series.
6. Crane operators shall be properly trained and experienced in operation of the crane or hoisting device.
7. Crane Operator shall have one of the following in possession during crane inspection and operation: valid State of New Mexico Crane Operator's License or certification that indicates completion of a State of New Mexico recognized, in-house training course based on ASME B30 standards for hoisting operators and who is employed by the entity that taught the training course or contracted to have the training course taught.
8. Ordinary/Documented Lift Plan: Lift planning shall comply with ASME P30.1, Planning for Load Handling Activities, and 48 CFR 970.5223-1, "Integration of environment, safety, and health into work planning and execution"—a.k.a. Integrated Safety Management System (ISMS). The following additions and exceptions to the above cited standard should also be implemented:

NOTE: All lifts (ordinary, ordinary that requires special consideration, and critical lifts) need to be planned.

   a. A written lift plan beyond normal site work planning and control documents is not required for ordinary lifts, other than crane operations. However, the Lift Director may determine that a written plan is prudent.
   b. The Lift Director shall ensure that in addition to the ASME P30.1 "Standard Lift Plan" considerations, the following pre-lift planning issues are addressed, as applicable, prior to the lift.
      i.) Identify the item to be moved, its intrinsic characteristics (e.g., load integrity, loose materials, liquids), weight, dimensions, center of gravity, ability to support imposed lifting forces (both the load and any lift points), and whether it contains any hazardous or toxic materials.
      ii.) Validate the loads path and clearances.
      iii.) Identify lifting equipment and rigging to be used by type and rated capacity.
      iv.) Prepare rigging sketches, as necessary.
      v.) Evaluate the work area for conditions impacting crane setup operations (e.g., weather, soil-bearing capacity, underground utilities, clearances to power lines and other structures).
      vi.) Identify any special or site-specific operating procedures and special instructions (e.g. evacuation of occupied areas). See Paragraph 2.5, "Coordination of Work Affecting Ongoing Sandia Operations" for additional requirements.
9. Ordinary Lifts That Require Special Consideration: Some ordinary lifts have additional risks that warrant special consideration. Such lifts shall have documented plans but do not require the technical rigor of a critical lift and do not have to be performed in a step-by-step sequence. If sequential actions are required because of the complexity of the lift or operation, then they must be noted in the lift plan. A written lift plan shall be created for lifts where any of the following conditions are present:

a. Load transfer, such as transferring a load in mid-air from one lifting device to another
b. Any load that its center of gravity might be relocated due to lifting operation, such as a tank filled with liquid
c. Use of multiple lifting devices, such as the use of more than one piece of lifting equipment in sharing the load (Ref. 29 CFR 1926.1432)
d. Use of complicated custom-designed rigging equipment or hardware
e. Working within the reach of the crane (the area 360° around the crane equipment, up to the crane equipment's maximum erected/fully extended boom length) to the following electrical hazards:
   i.) the specified clearance of power lines per 29 CFR 1926.1407–1411 or ASME B30.5 (2018)
   ii.) the limited approach boundary of exposed energized electrical equipment as defined per NFPA 70E
   iii.) Multiple load line operation such as those referred to in 29 CFR 1926.1432

10. Critical Lift Requirements:
    a. The SDR or SDR-appointed person shall classify each lift/load handling activity into one of the DOE categories (ordinary, special critical, personnel, or pre-engineered production) prior to planning the lift. A lift shall be classified critical if any of the following conditions are met:
       i.) If loss of control of the item being lifted would likely result in the declaration of an emergency as defined by the facility's emergency plan or construction site emergency plan (such as release of radioactive or hazardous material into the environment exceeding the established permissible environmental limits).
       ii.) The load item is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility, or project operation.
       iii.) 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.
       iv.) If mishandling or dropping of the load would cause any of the above noted consequences to nearby installations or facilities.
       v.) The lift involves unique characteristics that warrant a critical lift. Examples may include loads requiring exceptional care in handling due to size, weight, close-tolerance installation, suspended load hazards, high susceptibility to damage, and/or lifts using multiple pieces of lifting equipment, as determined by the SDR.
       vi.) For steel erection, a lift shall be designated as a critical lift if:
          - the lift exceeds 75% of the rated capacity of the crane or derrick, or
          - the lift requires the use of more than one crane or derrick (refer to 29 CFR 1926.751).

NOTE: Further site-specific criteria may be developed to supplement those cited above and may include criteria imposed by site or project safety basis requirements as well as lifting loads that require exceptional care in handling because of size, weight, close-tolerance installation, or high susceptibility to damage, as well as lifts using multiple pieces of lifting equipment.

NOTE: The critical lift plan must be followed in sequence as written unless noted otherwise.

NOTE: Though lifting personnel may meet the above criteria, personnel lifts shall not be considered critical lifts and shall be conducted in accordance with 29 CFR 1926.1431 and ASME B30.23.

b. Ensure that the requirements are met for lifts specified in each paragraph of this standard for each particular equipment category.
c. The operating organization shall appoint a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (Lift Director). The Competent/Qualified Person/Lift Director shall be present at the lift site during the entire lifting operation.
d. The Lift Director shall have the necessary knowledge and experience of the specific type of equipment and assigned lifting operations, as well as understand the site rules and procedures addressing the following administrative requirements for lifting operations:
   i.) Personnel assignments and responsibilities commensurate with job requirements
   ii.) Selection of proper slings, rigging hardware, and lifting equipment
   iii.) Recognition and control of hazardous or unsafe conditions
   iv.) Job efficiency and safety
   v.) Critical lift determination and documentation
e. The Competent/Qualified Person shall ensure that a documented pre-job plan or procedure is prepared by qualified person(s) that defines the operation and includes the following:
   i.) Identify the item to be moved, its intrinsic characteristics (e.g., load integrity, loose materials, liquids), weight, dimensions, its center of gravity, its ability to support imposed lifting forces (both the load and any lift points), and whether it contains any hazardous or toxic materials.
   ii.) Identification of operating equipment to be used by type and rated capacity (e.g., mobile crane, overhead crane, forklift).
   iii.) Rigging sketches and/or descriptions that include (as applicable):
      - Identification and rated capacity of slings, lifting bars, rigging accessories, and below-the-hook lifting devices. Calculate and provide the rated capacity of equipment in the configuration in which it will be used.
      - Load indicating devices
      - Load vectors
      - Lifting points
      - Sling angles
      - Required lifting equipment movement (e.g., boom and swing angles, trolley and bridge motions)
      - Methods of attachment
      - Crane orientations
      - Other factors affecting equipment capacity (e.g., load path sketch, key point heights, floor or soil bearing capacity)
   iv.) Operating procedures and special instructions to operators including rigging precautions and safety measures to be followed as applicable.

- All rigging equipment used in critical lifts (i.e., slings, below-the-hook lifting devices, and rigging hardware) shall be proof load tested in accordance with applicable ASME standards.
- Experienced operators who have been trained and qualified to operate the specific equipment to be used shall be assigned to perform the lift. Operations that include below the hook require some type of rigging equipment training.
- Only designated, qualified signalers shall give signals to the Operator. However, the Operator shall obey a STOP signal at all times, no matter who gives the signal.
- The procedure and rigging sketches shall be reviewed and approved by a qualified person (technical authority), the responsible manager (or designee), and the responsible oversight, which could include a competent safety person and qualified rigging engineer before the lift is made. Subsequent revisions shall be approved per site-specific procedures.
- A pre-lift meeting involving participating personnel shall be conducted prior to making a critical lift. The critical lift plan/procedure shall be reviewed, and questions shall be resolved.
- Prior to executing a critical lift, a Qualified Person shall verify that the as-installed rigging matches the configuration in the approved lifting plan.
- If required by the critical lift procedure, a practice lift shall be done before the critical lift. Conditions for a practice lift should closely simulate actual conditions involving weight, rigging selection and configuration, load movement path, and other relevant factors. Practice lifts should be performed by the same crew using the same lifting equipment that will be used in the lift. The crane/equipment should be operated through the full range of motion prior to performing the lift.
- Although individual plans are generally prepared for critical lifts, multi-use plans may be employed to accomplish recurrent critical lifts. For example, a multi-use plan may be used to lift an item or series of similar items that are handled repeatedly in the same manner. However, if the lifting equipment or rigging must change to accomplish the lift, the critical lift plan must be revised and approved accordingly.

11. Millwright/Moving: The Contractor shall use properly-rated equipment for millwright and industrial moving operations. Considerations shall be made for floor loading, building considerations, knowledge of the weight being moved, unstable loads, anchor points, tie-downs, chocks, struck-by objects, caught-between hazards, and training.
    a. Use Cribbing and/or Blocking on a Forklift
        i.) Blocking or cribbing is defined as the use of wood or other material to support equipment or a component and distribute loads to the ground.
        ii.) Use only engineered cribbing (purpose built and approved for safely securing a load on the tines of a forklift) on a forklift.
        iii.) Use cribbing on a forklift only if written approval is provided by the Manufacturer or by a Professional Engineer based on a safety analysis of the design.
        iv.) Cribbing shall not extend above the load backrest.

NOTE: This excludes the use of single pallets, frames, or boxes designed for material handling, transporting, and storing of equipment and materials specifically intended for use with a forklift. Contact the SDR and SE for support regarding the use of cribbing on a forklift.

12. Digger-Derricks:
    a. The digger derrick is a multi-use piece of equipment. Generally, the 1910.269 standard applies to the use of a digger derrick by a Qualified Electrical Worker and Operator.
    b. For nonqualified electrical workers, refer to **1926.1408**. Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 ft to a power line. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this paragraph, as follows:
        i.) **1926.1408(a)(2)(i)** Option (1) – Deenergize and ground. Confirm from the Utility Owner/Operator that the power line has been deenergized and visibly grounded at the work site.
        ii.) **1926.1408(a)(2)(ii)** Option (2) – 20-ft clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories) gets closer than 20 ft to the power line by implementing the measures specified in paragraph (b) of this paragraph.
        iii.) **1926.1408(a)(2)(iii)** Option (3) – Table A clearance.
        iv.) **1926.1408(a)(2)(iii)(A)** Determine the line's voltage and the minimum approach distance permitted under Table A (see § 1926.1408).
        v.) **1926.1408(b)(5)** The requirements of paragraph (b)(4) do not apply to work covered by subpart V of this part [Electric Power Transmission and Distribution].
    c. Qualified High-Voltage Worker working on transmission and distribution systems.
        i.) 1926.960 – Electric Power Transmission & Distribution – Working on or near exposed energized parts

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NOTE: Most of this section deals with qualified workers doing live-line barehand-type work from aerial lifts on energized conductors. The only part that applies to the digger derrick crews is the two-man rule, if lines are potentially energized. Approach distances are calculated for live line work, not mechanical equipment.

BB. Confined-Space Entry

Contractor work practices and procedures shall incorporate all applicable regulatory requirements and Sandia specifications, and knowledge of the content of applicable regulatory standards should be considered fundamental for any Contractor who proposes to engage in confined space operations at Sandia.

1. **Types:** There are three types of construction-confined space entry operations recognized at Sandia/New Mexico and labeled as follows:
    a. Permit-required. Posted with signs stating DANGER – CONFINED SPACE – ENTER BY PERMIT ONLY or other similar language.
    b. Non-permit. Posted with signs stating CAUTION – CONFINED SPACE – CONTACT SPACE OWNER FOR PERMISSION TO ENTER or other similar language.
    c. Telecommunications
2. In areas that appear to meet the criteria of a confined space (limited means of entry and exit, large enough to bodily enter, not designed for continuous human occupancy), absence of appropriate signage shall not be interpreted to mean that the area is not a confined space.
    a. Sandia personnel are responsible for assessing and characterizing all confined spaces on Sandia property. Most Sandia-confined spaces are labeled with space numbers that planners use to provide information to the Contractor who will enter the confined space. The Facilities Industrial Hygienist can also assist and provide this information. The

information will state if the space is non-permit required or permit required and whether a permit-required confined space can be entered under alternative procedures (C5) or reclassified (C7).

i.) Entry under paragraph C5

If the only hazard posed by the permit space is an actual or potential hazardous atmosphere that can be controlled through the use of forced-air ventilation, the space can be entered under alternative procedures as described in 29 CFR 1910.146 (c)(5). Such spaces must be continuously monitored using a four-gas confined space meter and must be continuously ventilated. The space must be verified to be safe for entry, and this must be certified in writing. The written certification is required to contain the date, the location of the space, and the signature of the person providing the certification.

ii.) Entry under paragraph C7

A space classified as a permit-required confined space may be reclassified as a non-permit confined space under the following procedures:

- If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as all hazards remain eliminated.
- Non-atmospheric hazards include unguarded moving parts, potential for electrical shock, piping of liquids into the space, etc. If these hazards can be eliminated from outside the space through LOTO, or by blocking/disconnecting lines, discharging stored energy, blocking movement, etc., the space may be reclassified. If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed as a permit-required confined space entry.
- The steps taken to eliminate hazards must be documented through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification shall be made available to each employee entering the space.
- If hazards arise within a permit space that has been declassified to a non-permit space under paragraph (c)(7), each employee in the space shall exit the space and the space must be reevaluated to determine whether it must be reclassified as a permit space.

3. **Signage:** In areas that appear to qualify as a confined space, absence of appropriate signage shall not be interpreted to mean that the area is not a confined space.
4. **Written Confined Space Program**: The Contractor is responsible for developing confined space entry programs and issuing confined space permits.

   The Contractor's written confined space program shall comply with 29 CFR 1926 Subpart AA and include at a minimum the following requirements:

   a. Define how spaces are classified:
      i.) Permit-required confined space (PRCS)
      ii.) Non-permit confined space (NPCS)
   b. Define alternate procedure/reclassification of PRCS (optional)
      i.) C5 alternate procedure (atmospheric hazard only)
      ii.) C7 reclassification (non-atmospheric hazards)
   c. State training objectives/requirements for:
      i.) Supervisor Authorizing Entry (SAE)

ii.) Authorized Entrant
iii.) Attendant

d. Implement measures that prevent unauthorized entry into PRCS
e. Identify and evaluate the hazards of permit spaces
f. Develop and implement procedures for safe permit space entry operations, including but not limited to the following:
   i.) Define atmospheric monitoring requirements:
      - Instrument used for calibration and bump testing, hazards monitored, and documentation of results
      - Acceptable entry conditions specifying OSHA PEL or ACGIH TLV, whichever is most protective
   ii.) Identify control measures including:
      - Communication: Two-way radio, voice, visual, etc.
      - Isolation
      - Cleaning
      - Purging
      - Inerting
      - Flushing
      - Ventilation
      - Protective equipment
      - Rescue equipment
      - LOTO of equipment
   iii.) State pre-entry briefing requirements:
      - Frequency
      - Items/safety issues covered
      - Attendance requirement and documentation
   iv.) Address requirement for entrant protection from outside hazards as necessary via pedestrian, vehicle, or other barriers.
   v.) Address verification procedures of conditions in the permit space as being acceptable for entry throughout the duration of an authorized entry.
   vi.) Provide provision for authorized entrant or their authorized representative to have the opportunity to observe any monitoring or testing of permit spaces.
   vii.) If C5 alternate procedures are incorporated into written plan, develop and implement requirements set forth in 1910.146(c)(5).
   viii.) If C7 reclassification is incorporated into the written plan, develop and implement requirements set forth in 1910.146(c)(7).
g. Identify non-entry rescue methods
   i.) Non-entry retrieval equipment
   ii.) Extraction procedures
h. Develop and implement an Emergency Response Plan that has appropriate elements of the following:
   i.) Rescue of Personnel in Permit Required Confined Spaces at Sandia/NM. See Appendix C.
   ii.) Contact Sandia Emergency Management Communications Center (EMCC) (505-844-0311):

- Just prior to entry
- After entry is terminated
- If any emergency situation occurs

i. Includes forms for permit-required confined space entry
   i.) SF 2001-CSS, *Confined Space Permit Sign-In/Sign-Out Sheet for Emergency Response*
   ii.) Contractor's permit
   iii.) Contractor's C5 alternate procedure form, if implemented into written Confined Space Program
   iv.) Contractor's C7 reclassification form, if implemented into Contractor's written Confined Space Program
   v.) Address method used to inform SDR of hazard(s) confronted or created in permit spaces through a debriefing or during entry operations.

5. **Permit Required Confined Space:** At Sandia, PRCS entry is categorized as high-risk work. The Contractor must develop a task-specific AHA for entry and meet with representatives from the ES&H Support Team subject matter experts (SME) prior to entry to ensure that all hazards are adequately identified and that all entry requirements comply with applicable standards:
   a. 29 CFR 1910.146 and approved written Confined Space Program
   b. SAE, attendant, and authorized entrant(s) shall be current with training requirements
   c. Conduct a pre-entry briefing
   d. Fill out permit
      - Implement all controls noted on permit
      - Wear all PPE required for entry noted on permit
   e. Personnel making a confined space entry shall follow the procedures in Appendix C, "Rescue of Personnel in Confined Spaces at Sandia/NM," to establish their confined space entry plan.
   f. Notification requirements include the following:
      - Communication must be established with the Sandia EMCC at the job site prior to entry. This can be accomplished via cell phone, if working outside of limited areas, or two-way radio. Safety engineers have two-way radios that can be loaned to the Contractor for a confined space entry.
   g. The Contractor shall identify the specific location of the confined space (building, room, space type; if the space is outside, indicate the direction [NW, SE, etc.] from the closest building).
   h. The Contractor shall identify the individual serving as the SAE (for purposes of overseeing the entry), the company name, and number of entrants and attendants.
   i. The Contractor shall identify the communication equipment used to contact EMCC and the means used to communicate between the attendant and entrants.
   j. SF 2001-CSS, *Confined Space Permit Sign-In/Sign-Out Sheet*: This form is used to maintain accurate, real-time tracking of entrants for emergency response. Use of this form only becomes necessary when different entrants other than those initially identified on the permit are involved in the entry.
   k. Atmospheric Monitoring: Perform atmospheric monitoring on a continuous basis for the duration of the entry. If monitoring indicates the presence of atmospheric contaminants above acceptable concentrations, NO ENTRY IS ALLOWED. If entry has already

occurred when contaminants are detected, exit the space immediately and contact SE, SDR, and EMCC.

i.) If C5 alternate procedures are allowed under the Contractor's written Confined Space Program and are used, notification to EMCC is not required.

ii.) If C7 reclassification is allowed under the Contractor's written Confined Space Program and is used to enter the PRCS, then the following apply:

- Notification to Sandia EMCC is not required.
- Atmospheric monitoring is not done (no actual or potential hazardous atmosphere exists).
- Verification of all non-atmospheric hazards have been eliminated prior to entry.

iii.) Completion/termination of permit entry:

- Entry activity was completed safely and space returned to normal condition.
- Notify EMCC that PRCS entry is terminated.
- Debrief SDR of any problems during entry operations or suggestions for improvement.

6. **Non-Permit Confined Space:** This refers to a space that fits the definition of a confined space but lacks any inherent or introduced hazards. Entry into this type of space includes:
   a. Pre-entry briefing
   b. If operations performed within and/or in close proximity to the confined space create additional hazards that impact safeguards and entry procedures, space shall be treated as a PRCS and follow the requirements of 29 CFR 1910.146 and the Contractor's written Confined Space Program.
7. **Commissioned Telecommunication Manholes and Vaults:** These must comply with the following:
   a. 29 CFR 1910.268
   b. When covers of manholes or in-ground vaults are removed, the opening shall be promptly guarded by a railing, temporary cover, or other suitable temporary barrier that is appropriate to prevent an accidental fall through the opening.
   c. Telecommunication manholes and vaults that have been newly constructed or are part of an ongoing construction project are not considered commissioned and shall comply with 29 CFR 1926 Subpart AA.

CC. Electrical Manholes

Electrical manholes are identified as permit-required confined spaces for initial entry, and a visual assessment of current conditions inside the manhole is required. Based on an arc flash assessment performed by Sandia High-Voltage Engineering (documented in PCD-030, *Entry into Underground Communications and Power Confined Spaces at Sandia National Laboratories*) the minimum PPE for initial entry into an electrical manhole is Hazard Category 2 PPE. Hazard Category 2 PPE is defined in the current version of NFPA 70E. After permit-required confined space initial entry (including air monitoring) has confirmed no atmospheric or exposed electrical hazards exist, then the space can be reclassified under the C7 process as a non-permit entry space.

The process for entry into an electrical manhole shall be:

1. AT NO TIME SHALL INTERACTION OR MANIPULATION OF ENERGIZED CIRCUITS/PARTS BE PERFORMED UNDER THIS PROCESS
2. Perform initial entry into the electrical manhole by following the permit-required confined space entry process. Minimum of Hazard Category 2 PPE is required for initial entry.
3. Evaluate whether hazards exist.

a. If initial entry determines there are no hazards (including but not limited to physical, atmospheric, or exposed electrical parts), then proceed to step 4.
b. If any hazards are identified in the initial entry, then Entrant shall exit the manhole and work shall be paused and re-evaluated.

4. Entrant shall exit the manhole, and the reclassification process under C7 must be followed.
   a. Once the C7 process is complete, the manhole may be re-entered as a non-permit confined space. A minimum of two workers will be required to be on-site during any work activities inside the manhole and a minimum of Hazard Category 2 PPE (excluding gloves and hood) shall be worn while inside the manhole

DD. Electrical Safe Work Practices

Ensure that electrical work, equipment, and installations are in compliance with the National Electric Code (NEC); National Electric Safety Code (NESC); NFPA 70E, Standard for Electrical Safety in the Workplace; and OSHA standards. When conflicts exist between OSHA and NFPA 70E, the Contractor shall review the affected work with the Sandia team prior to operations. Subcontractor and manufacturers' representatives shall be managed to the above standards.

1. **Training:** Employees who face a risk of electrical hazard that is not reduced to a safe level by the applicable electrical-installation requirements shall be trained to understand the specific hazards of electrical energy and identify and understand the relationship between electrical hazards and possible injury. Retraining is required for qualified workers every 3 years.
2. **Documentation:** The Contractor shall document that each employee has received the training on electrical hazards and controls necessary for their safety. Records shall be maintained for the duration of the employee's employment and shall contain each employee's name and dates of training.
3. **Lockout/Tagout:** Lockout/tagout procedures shall be documented in the Contractor's CSSP. The procedures shall be appropriate for the experience and training of the employees and the conditions that exist in the workplace. The procedure shall address employee and management responsibilities associated with LOTO, training, system/hazard communication, and energy control methods (e.g., types of locking devices, authorized testing equipment, and PPE). A lock must always be applied (Article 120) NFPA 70E. See Appendix D, "Electrical Job Aid for Contractors," for additional information.
4. **Simple LOTO:** Involves only qualified person(s) de-energizing one set of conductors (energy source) for the sole purpose of safeguarding employees from exposure to electrical hazards.
5. **Complex LOTO**
   a. When one or more of the following exists:
      i.) Multiple energy sources
      ii.) Multiple crews
      iii.) Multiple crafts
      iv.) Multiple locations
      v.) Multiple employers
      vi.) Unique disconnecting means
      vii.) Complex or particular switching sequences
      viii.) Job or task that continues for more than one work shift
   b. All complex LOTO procedures shall require a written plan of execution per NFPA 70E. In addition to the CSSP complex LOTO section, the on-site plan shall include:
      i.) A person in charge shall be identified and on-site.

ii.) A method to account for all persons who might be exposed to electrical hazards in the course of the LOTO shall be established. One of the following methods is to be used:

- Each individual shall install their own personal LOTO device.
- The person in charge shall lock their key in a lock box.
- The person in charge shall maintain a sign-in/sign-out log for all personnel entering the work area.
- Another equally effective methodology shall be used.

6. **Arc-Flash Protection:** Arc-flash-protection procedures shall be documented in the Contractor's CSSP. At a minimum, documentation shall include requirements for (1) developing arc-flash boundaries; (2) requirements for protective clothing, hard hats, eye protection, face shields, hand and foot protection, and hearing protection based on hazard/risk category classifications; and (3) care and maintenance of arc-rated (AR) clothing, AR flash suits, and other PPE.
   a. If the Sandia electrical equipment/system to be worked on has an arc-flash hazard (AFH) warning label, contract employees wear PPE and establish flash boundaries specified in their employer's CSSP for the hazard level/category identified on the label. If the electrical equipment is not provided with an AFH warning label, contract employees implement controls, wear PPE, and establish flash boundaries as identified in their employer's CSSP for the hazard/risk categories specified in Table 2-2 and Table 2-3.

Table 2-2. AFH Guidance

PPE Category	AFH Guidance (No Label Present)	AFH Guidance (Label Present)		
	Minimum Required PPE	Incident Energy (cal/cm^2)	Minimum Required PPE	Label Header
1	Contact Electrical Systems Engineer (ESE) for AFH Analysis and/or use Arc Flash PPE Category Method per NFPA 70E Article 130	0–4	**EWC + ACC**	Orange
2		4–8		
3	Contact ESE for AFH Analysis	8–25	**ISC**	Orange
4		25–40	**ESC**	Orange
N/A	Contact ESE for guidance to establish electrical switching clothing (ESC)	> 40	N/A	Red

Notes:

- PPE Category 0 (formerly Sandia National Laboratories Green label, 0–1.2 cal/cm^2) has been combined with Category 1 per NFPA 70E Table 130.7 (15)(c) Personal Protective Equipment. Arc flash labels that have less than or equal to 40 cal/cm^2 incident energy level have had label headers changed to orange color (formerly green, blue, and yellow) to conform to ANSI Z535.
- Everyday work clothing (EWC): AR long-sleeved shirt (minimum arc rating = 8) worn over an untreated cotton T-shirt with AR pants (minimum arc rating = 11), Class 0 gloves with leather protectors, leather boots or shoes, safety glasses, and hearing protection
- Accessories (ACC): Hard hat with AR face shield (minimum arc rating = 8) + AR balaclava (minimum arc rating = 12) or two-layer switching hood (minimum arc rating = 12)
- Intermediate Switching Clothing **(ISC):** EWC + AR coveralls (minimum arc rating = 25) + two-layer switching hood (minimum arc rating = 25)
- Electrical Switching Clothing **(ESC):** EWC + 40-calorie switching suit with rated hood and gloves
- Electrically-rated gloves may be replaced with leather if the person is observing/inspecting a work activity and does not come within 1 ft of energized/live parts/systems.

Table 2-3. Flash Boundaries

Nominal System Voltage Range, Phase to Phase[a]	Limited Approach Boundary[b]		Restricted Approach Boundary[b]; Includes Inadvertent Movement Adder
	Exposed Movable Conductor[c]	Exposed Fixed Circuit Part	
Less than 50 V	Not specified	Not specified	Not specified
50 V–150 V[d]	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	Avoid contact
151 V–750 V	3.0 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	0.3 m (1 ft 0 in.)

Notes:
a. For single-phase systems above 250 volts, select the range that is equal to the system's maximum phase-to-ground voltage multiplied by 1.732.
b. See definition in Article 100 and text in 130.4(D)(2) and Informative Annex C for elaboration (NFPA 70E).
c. Exposed movable conductors describe a condition in which the distance between the conductor and a person is not under the control of the person. The term is normally applied to overhead line conductors supported by poles.
d. This includes circuits where the exposure does not exceed 120 volts nominal.

7. **Shock Protection:** Procedures shall be documented in the Contractor's CSSP. At a minimum, documentation shall include requirements for the following: (1) developing limited shock approach boundaries, (2) requirements for voltage-rated gloves and insulated tools, and (3) maintenance and testing of PPE.
8. **Electrical Outage Requests:** Prior to performing work on any live parts that are not placed in an electrically safe work condition (i.e., prior to performing energized work), the Contractor shall contact the Electrical SCI and request an electrical outage. Exemptions to this requirement include tasks such as testing, troubleshooting, and voltage measuring, assuming appropriate safe work practices and PPE are provided and used in accordance with NFPA 70E.
9. **GFCI Protection:** Provide listed GFCI protection for 120-volt, single-phase, 15- and 20-ampere receptacle outlets on work sites that are in use by employees.
10. **Lighting System Protection:** Lighting systems may include independent secondary emergency lighting circuits. Construction projects in existing installations involving lighting system work shall identify all applicable electrical circuits and ensure that an outage plan includes that all applicable lighting systems be de-energized and, for work on 277 VAC lighting systems, require zero energy verifications measuring phase to phase and phase to ground—and as an additional de-energization verification, to measure neutral to ground.

EE. Energized Electrical Work

This includes work performed on live parts > 50 volts that are not placed in an electrically safe work condition.

1. Energized work shall not proceed without written justification/authorization from the Sandia Project Manager and Contractor's written permit. Permit and authorization shall be available on-site during the energized work task. The Contractor's written permit shall include, at a minimum, all items required by NFPA 70E.
2. When working on or near energized parts in hallways, corridors, or other areas used for passage, maintain a working space barrier with caution tape and signage. The working space boundary for barriers shall be defined at the "limited-approach boundary."
3. Do not leave exposed energized parts unattended in areas occupied by those other than construction personnel. Do not leave exposed energized parts without providing working space barrier at the "limited-approach boundary."
4. Comply with the following when working on energized electrical parts:
   a. Notify the SCI before proceeding with work.

b. Electrical work on energized electrical parts shall be performed by a qualified individual with a second qualified person available.

c. Individual shall be knowledgeable and experienced in working with the specific type of electrical circuits on which energized electrical work is to be performed. See Section 26 04 75, "Primary Systems Safety Requirements," for additional requirements.

FF. Steel Erection Work

1. This includes any steel erection operations involved in construction, alteration, and/or repair of single- and multiple-story buildings, bridges, and other structures where steel erection occurs.
2. Each employee engaged in steel erection tasks that are on a walking working surface with an unprotected side or edge more than 6 ft above a lower level shall be protected from fall hazards.

GG. Fall Protection

Control the methods used to protect employees from fall hazards, which may include elimination, engineering controls, administrative controls, and PPE.

1. The CSSP shall identify fall-protection methods, administrative controls, or both to be used for all work that is at or more than 6 ft above a lower level or within 15 ft of an unprotected side or edge for all construction trades excluding roofers. The requirement is within 6 ft for roofers.
2. Anchor points to be connected by drilling, welding, or attaching to Sandia structures/buildings used for fall-protection purposes must be reported to the SDR/SE for Sandia approval prior to installation and use.

HH. Asbestos Safety

Asbestos might be present in existing building materials, finishes, and mechanical systems.

1. Asbestos-containing building materials are identified as part of the JSHE. An Asbestos Work Release Permit is attached to the JSHE report.
   a. Work may proceed only if the Contractor's work activities do not damage or disturb the asbestos-containing materials. If work site conditions or the scope of work changes, or if the Contractor is unsure if work activities will damage or disturb potential asbestos-containing building materials, the Contractor must stop work and contact SE or the SDR for further instructions.
   b. If construction activities uncover hidden finishes or building systems that are suspected to contain asbestos, the Contractor must stop work and contact SE or the SDR for further instructions.
2. **Asbestos Work Release Permit:** This permit documents existing asbestos hazards and provides recommendations to control or eliminate the hazards. The Contractor must conduct a pre-work safety meeting with workers to review the Asbestos Work Release Permit guidance and follow the guidance exactly when performing the work.

II. Lead Paint

Many of the older buildings and assets have coatings that contain lead. If work on a facility building or painted assets requires the use of power tools to cut, sand, or otherwise abrade a painted surface, assume that the paint contains lead. Sandia recommends removing the paint or coating from the surface before conducting work on the surface. Coating can be removed by using strippers or by using hand tools and wet methods. Sandia recommends using "Peel Away" stripper. If surface coatings cannot be removed before the surface is cut or ground, welded, or cut with a torch, then respirators must be worn by the operator and anyone in the vicinity. Comply with the requirements of 29 CFR 1926.62, "Lead."

JJ. Vehicle Safety

All mobile equipment identified in 29 CFR 1926.1001 that are used on Sandia project sites shall have roll-over protective structures (ROPS). There are no mobile equipment ROPS exemptions on Sandia construction projects for those pieces of equipment.

KK. Weather Conditions

Contractors are advised that Sandia uses a wind alert and lightning warning system for outdoor activities, consisting of a 20 mile lightning advisory and a 10 mile lightning warning. Contractors are encouraged to implement appropriate controls to protect their employees in accordance with their own safety programs.

2.8. High-Risk Work

A. High-risk work is defined as work that may result in serious personal injury or a fatality if performed improperly. The increased risk is based upon characteristics inherent in the work task, location, materials, or proximity to other hazards.

1. High-risk work activities include but are not limited to the following:
   - Critical crane lifts
   - Penetrations into structures with high-voltage hazards (including but not limited to electric duct banks, electric manholes, or concrete electric pull boxes)
   - Excavation within 5 ft of known hazardous energy utilities (electrical, natural gas, other pressurized systems, etc.) or personnel entry into an excavation > 5 ft in depth
   - Energized electrical work
   - Work within 10 ft of aerial high-voltage power lines (> 50kV)
   - Wall, floor, or ceiling penetrations where a site investigation cannot identify all potential hidden hazards
   - Permit required confined space entry
   - Roof work within 6 ft of an edge not protected by standard guardrails (OSHA compliant), parapets, or similar physical barriers
   - Elevated work without the use of an approved ladder or engineered fall-protection system greater than 6 ft above a lower level or within 15 ft of an unprotected side or edge for all construction trades, excluding roofers. For roofers, the requirement is within 6 ft of an unprotected side or edge. The use of an approved ladder or engineered fall-protection system shall be documented in the CSSP. If conventional fall protection systems cannot be used or creates a greater hazard, alternative control methods must be documented in an AHA. This includes the use of a safety monitor.
2. Work activities that have been determined to be high-risk activities require the Contractor to prepare and submit an AHA to Sandia for approval.

B. The AHA shall outline the specific procedures and precautions necessary to safely conduct a particular high-risk activity.

1. The AHA shall identify the controls that the Contractor will use to mitigate each hazard. Controls should be based on the hierarchy of controls (e.g., engineering, administrative, PPE), as feasible.
2. Any required supporting documents (e.g., permits, procedures, engineering calculations, training) shall be attached to the AHA for high-risk activities.

C. The Contractor Safety Representative or delegate shall provide oversight for the high-risk work and shall have specific training or experience for the type of high-risk work being performed. The

oversight should be based on rigor, and oversight shall be determined by the Contractor Safety Representative and the SE.

D. A minimum of two persons shall be present for high-risk work activities and shall have the ability to make notifications should an emergency response be needed.

2.9. Suspension of Work

A. General Activity Pause

1. All employees, contractors, and visitors have the responsibility and authority to suspend inappropriate or unsafe work activities/tasks when those activities/tasks present clear and imminent danger to employees, contractors, visitors, the public, or the environment.
2. Personnel may suspend activities/tasks they observe or in which they are a participant, if they believe the activities/tasks present an imminent danger.
3. Each Contractor shall communicate the unacceptable consequences for work at this site. Upon receiving a suspension of work request (oral or written), immediately cease the activity/task and notify the SCI or SDR.
4. Obtain the name and telephone number of the person requesting the suspension and the reason for the suspension of work.
5. Work shall not continue on that activity/task until the issue has been resolved to the satisfaction of the SDR.
6. The SCI or SDR may restart the activity/task only after review and approval of the oral or written response submitted by the Contractor.

B. Stop Work Order

1. A Stop Work Order that affects the crew for a period greater than 1 hour shall be followed by issuance of a formal written Stop Work Order from the Sandia Subcontracting Professional (SSP).
2. Work may be restarted only with written work release from the SSP. A Stop Work Order will include the following information:
   a. Date and time when work was stopped
   b. Reason for work stoppage
   c. Requirements for Contractor to resume work
   d. Date and time when Sandia expects corrective actions to be completed, if required

C. Work Stoppage Release

1. The SSP shall provide a written work release to allow work to resume that includes the following:
   a. Reference to the Stop Work Order
   b. Reason for work stoppage
   c. Conditions for restart of activity/task
   d. Specified date, time, and conditions when work may resume

D. Hold Work Order

1. A Hold Work Order is a document issued through the contract that prevents work on some future task. This is a planning tool to require further evaluation of a condition or plan before a task is performed. For example, a Hold Work Order may be issued prohibiting the pouring of concrete until the rebar mat is inspected.
2. A Contractor shall not perform the work described on the Hold Work Order until the signature of an SDR is obtained.

3. Any Hold Work Orders issued shall be available on-site while applicable to the project being worked.
4. The Hold Work Order does not affect any other restrictions listed elsewhere in this document. The Hold Work Order is not a Stop Work Order.

2.10. Event Notification

A. In the event of an emergency (serious injury, fire, etc.), immediately call 911 on any Sandia telephone or (505) 844-0911 on an outside/cellular telephone.

1. After calling for emergency support, the Contractor shall contact SE, SCM, SDR, or SPM as soon as possible, but not later than 2 hours following the event.
2. All calls must include person-to-person contact (a voice message is not sufficient).

B. Non-Emergency Events

If the event is not an emergency, the Contractor shall contact the Sandia non-emergency number by immediately calling 311 on any Sandia telephone or (505) 844-0311 on an outside/cellular telephone. Contact SE, SCM, SDR, or SPM as soon as possible, but not later than 2 hours following the event.

C. General

When the Contractor becomes aware of an event that could adversely impact workers, the public, or the environment, or cause unplanned disruptions of normal operations, the Contractor shall barricade, as appropriate, to ensure workers and pedestrians in the area are not exposed to a hazard and notify SE, SCM, SDR, or SPM of the event (when in doubt, report it). Leaving a message on voicemail or sending a page does not meet this requirement of notification; the Contractor must speak to SE, SCM, SDR, or SPM.

To report an injury, regardless of OSHA recordability, use form SF 2050-P, *Contractor Report of Occupational Injury/Illness*.

D. Exposure

When the Contractor becomes aware of any monitoring results that indicate personnel exposure to chemical, biological, or physical hazards are above limits established by OSHA or ACGIH, the Contractor shall notify SE, SCM, SDR, or SPM as soon as possible. Leaving a message on voicemail or sending a page does not meet this requirement of notification; the Contractor must speak to SE, SCM, SDR, or SPM.

NOTE: Ensure barricading is installed as appropriate to provide awareness and protection to workers and pedestrian or vehicle traffic in the vicinity of the event.

APPENDIX A. OCCUPATIONAL MEDICINE SERVICES

A.1 Purpose

All contractors must comply with the DOE's Worker Safety and Health Program regulation, 10 CFR 851, Worker Safety and Health Program (WSHP). The WSHP enforces worker safety and health requirements, including but not limited to existing standards of OSHA, ANSI, and Workers Compensation Laws, as incorporated in the Sandia WSHP.

To assist in ensuring contractors meet the worker safety and health provisions of 10 CFR 851 in the occupational medicine functional area, Sandia requires contractors to provide a written declaration identifying their occupational medicine providers (OMP), as applicable, prior to performing work.

A.2 Applicability

Contractors at all tiers who meet the applicability criteria below must establish and provide comprehensive occupational medicine services to workers employed at DOE-controlled premises. Occupational health personnel providing services must maintain current license, registration, or certifications as required.

A.3 Criteria

- Work on a DOE site for more than 30 days in a 12-month period

  or

- Are enrolled for any length of time in a medical- or exposure-monitoring program required by this rule and/or any other applicable federal, state, or local regulation or other obligation.

A.4 General Requirements Summary Information

In accordance with New Mexico Workers Compensation Laws, OSHA, and DOE regulation (10 CFR 851, Worker Safety and Health Program), contractors at all tiers must have an OMP for performing hazard-based medical monitoring and surveillance; qualification-based fitness-for-duty medical evaluations; and injury and illness case management. The Contractor is responsible for maintaining the appropriate documentation to demonstrate compliance with the administration of necessary medical and health care programs and may be subject to assessments and audits.

Hazard-based medical monitoring and surveillance programs include but are not limited to the following:

- OSHA-specifically-regulated substances ("Expanded Health Standards"), including but not limited to the following: asbestos, arsenic, cadmium, chromium, lead, and methylene chloride
- OSHA occupational noise exposure

Qualification-based fitness-for-duty evaluations include but are not limited to the following:

- OSHA/ANSI respiratory protection
- Department of Transportation (FMCSA) commercial driver's license

Injury and illness case management includes but is not limited to the following:

- Determination of work-relatedness
- Work restrictions
- Rehabilitation
- Return to work

A.5 Occupational Medicine Program Requirements

Occupational medicine services must be under the direction of a graduate of a school of medicine or osteopathy. OMPs, such as physicians, nurses, physician assistants, nurse practitioners, psychologists, and employee-assistance counselors, must be licensed, registered, or certified as required.

Contractors shall make available to their OMP current activity-level hazard information, such as that listed in the CSSP and addenda. This information must include the following:

- Actual or potential work-related hazards (chemical, radiological, physical, biological, or ergonomic)
- Actual or potential work-site exposures
- Job functions
- Update information when a change to job functions, hazards, or exposures occurs

The following health evaluations shall be conducted when determined necessary by the OMP. The results of evaluations performed by the OMP must be communicated, as appropriate, to facilitate activity work controls and mitigation of hazards.

- Medical placement evaluation at the time of employment entrance or transfer to a job with new functions and hazards
- Hazard-based medical monitoring or qualification-based fitness-for-duty medical evaluations required by regulations and standards
- Medical diagnostic examinations to evaluate an employee's injuries and/or illnesses for work-relatedness, applicability of medical restrictions, and referral for definitive care, as appropriate
- After a work-related injury or illness or an absence because of any injury or illness lasting 5 or more consecutive workdays, inform the OMP provider to determine if an evaluation is necessary
- General health evaluation at the time of separation from employment
- The purpose, nature, and results of evaluations and tests must be clearly communicated verbally and in writing to each worker provided with testing, and the results must be documented in the medical record of the worker

Afford the OMP an opportunity to participate in worker safety and health meetings and committees, as well as an opportunity to conduct work site visits. Work-site visits are conducted for an evaluation of job conditions and issues relating to the health of their workers. All site visits by the OMP to Sandia-controlled premises must be coordinated with the Sandia Inspector. The Inspector notifies a representative from Employee Health Services of the visit request.

The Contractor shall ensure the OMP establishes a record, including any medical, health history, exposure history, and demographic data collected for occupational medicine purposes, which is maintained for each worker receiving occupational medicine services. Documents shall be stored in a manner that ensures their long-term preservation and retrieval. Records must remain confidential and protected from unauthorized access. Any psychological records shall be maintained separately from medical records and in the custody of the designated psychologist. Access to the records shall be granted in accordance with DOE regulations implementing the Privacy Act and the Energy Employees Occupational Illness Compensation Program Act.

Contractors at all tiers are responsible for workers' compensation administration and case management. The OMP shall monitor ill and injured workers to determine work-relatedness, facilitate their rehabilitation and safe return to work, and issue and/or remove restrictions as necessary. Ensure the OMP notifies the worker and the SDR for any issued and/or removed work restrictions and communicates results of health evaluations to management and safety and health protection specialists to facilitate the mitigation of work-site hazards.

The OMP must include measures to identify and manage the principal preventable causes of premature morbidity and mortality affecting worker health and productivity. The Contractor must include programs to prevent and

manage these causes of morbidity when evaluations demonstrate their cost-effectiveness. If programs are implemented, contractors must make available to the OMP appropriate access to information from health, disability, and other insurance plans (de-identified as necessary).

Submit Employee Assistance Programs to the OMP (EAP: Substance Abuse Rehabilitation Programs and Wellness Programs) for review and approval of the medical and behavioral aspects of these counseling and health promotional programs.

The Contractor shall ensure the OMP reviews the medical aspects of immunization as well as bloodborne pathogen and biohazardous waste programs to evaluate their conformance with applicable guidelines. The Contractor must determine the applicability and need for the specific programs based on work activities and actual or potential work site exposures of each employee.

Sandia shall provide the OMP the opportunity to review medical emergency response procedures in site emergency and disaster preparedness plans. Contact the SDR for assistance.

APPENDIX B. FACILITIES SUPERINTENDENT – JOB AID

Date: _____ Location: _____ Name:_____

The superintendent role is critical to the facilities construction success. It is also a requirement under 10 CFR 851. Listed below are approaches that support effective superintendent interaction and discussion with the work team.

- ☐ **Pre-work Planning**: Read the safety plan/CSSP and understand the specific elements that pertain to the project Scope of Work. Evaluate procedures to assure that adequate precautions exist for anticipated hazards.
- ☐ **Permits**: Ensure all required and applicable permits (SWPPP, FDCP, Fire Impairment, Hot Work Permit, Excavation Permit, Asbestos Work Release, Penetration Permit, Confined Space Entry Permit, Customer Work Release for Radiological Areas, etc.) are on-site and posted at the appropriate location(s).
- ☐ **Train/communicate with the crew** on the CSSP, JSHEs, permits, and possible hold points. Facilitate a "what if" discussion.
- ☐ **Increase awareness** of "high-risk activities"; working near high-voltage lines or gas lines, working at heights and/or on ladders, performing excavations, encountering struck-by equipment, etc.
- ☐ **Pre-Task Plan:** Ensure the pre-task plan is completed, and all workers understand the hazards, steps, and controls for the job at this time. **Ensure the crew(s) knows that they must re-evaluate for changes to the site conditions or work area**. **Maintain the PTP at the project site for access, review, and updating, by the crew(s).**
- ☐ **Anticipate changes**: Take time to closely examine the project-specific hazards throughout the day and allow the project team to implement proper controls in advance to avoid or mitigate them.
- ☐ **Lead by example**: Abide by safety rules and make time to be visible and challenge workers at the site to think about emerging and potential hazards.
- ☐ **Understand interaction with all contractors**: Communicate between crafts, within facilities, and with Sandia personnel.
- ☐ **Empower workers** to stop/pause work to address operational safety issues before an incident occurs. Ensure personnel look out for the safety of each other. Reward such behaviors.
- ☐ **Barricading:** Is proper barricading for pedestrian, vehicle, and overhead work in place?
- ☐ **Awareness of "scope creep"**: Identify when work transitions from one task to the next in the context of a PTP or an area of well-understood hazards to tasks exposing workers to unplanned hazards that have "crept" into the activity. **Do not perform activities that are not included in the approved scope of work.**
- ☐ **Identify span of control issues**: Are work crews properly supervised, and is there always a person with stop-work authority?
- ☐ **Identify the "critical thinkers"**: Empower critical thinkers to challenge the team, stop/pause work, rethink, and seek technical help when necessary.

Superintendent Hand-off Signature	Date	Time

Superintendent responsibilities include:

Superintendent shall be knowledgeable of the project's hazards and have full authority to act on behalf of the construction Contractor.

Superintendent shall perform frequent and regular inspections of the construction work site to identify and correct any instances of non-compliance with the CSSP.

Superintendent or delegate shall document the inspections, including any non-compliance and corrective action taken.

Superintendent shall perform a pre-work evaluation of subcontractors using a tool such as the checklist provided above to ensure the following:

- Knowledge of CSSP safety requirements that are applicable to their work.
- An evaluation of how these safety requirements will be implemented.
- Plan for how the requirements will be assessed, periodic management surveillances, supervisor pre-job briefs, and assessments. Provide immediate direction to workers when hazards not previously evaluated and controlled are identified. If immediate corrective action is not possible, or the hazard falls outside of project scope, the Superintendent or delegate:
  - Immediately notifies affected workers
  - Posts appropriate warning signs
  - Implements necessary interim control measures
- Notifies SE of the action taken

APPENDIX C. RESCUE OF PERSONNEL IN CONFINED SPACES AT SANDIA/NM

General Requirements and Advance Notification

The Contractor Entry Supervisor (also known as the Supervisor Authorizing Entry) shall:

- Provide advance notification of the permit-required confined space entry activity to Sandia Emergency Management Communications Center (EMCC), PHONE: 844-0311 (24-hour duty phone), to verify that rescue services are available. Advance notification must occur by phone on a daily basis for the duration of the entry activity.

NOTE: In Technical Areas or "limited access" areas where the use of cellular phones is prohibited, communication two-way radios suitable for contacting emergency response services are available from the SCI.

- Include means for EMCC to contact the Entry Supervisor (cellular, two-way radio, etc.) in the event emergency services become unavailable during the entry period.
- Provide an Emergency Response Plan that includes methods to notify Sandia EMCC just prior to entry, after entry is terminated, and if any emergency occurs.
- Ensure the Emergency Response Plan includes:
  1. Specific procedures for non-entry rescue and required Kirtland Fire and Emergency Services entry rescue.
  2. Must be reviewed and approved by the SDR in construction with the ES&H Support Team SME.
  3. Any deviations from non-entry rescue must be re-evaluated and approved by the SDR prior to implementation.
- Ensure that the means for summoning emergency response/rescue personnel is operable, on-site, and readily available.
- Select appropriate retrieval equipment to initiate non-entry rescue.
- Ensure all equipment and instrumentation is inspected prior to use to ensure proper working condition. Equipment shall be maintained in accordance with manufacturer's requirements.
- Post the entry permit at the entry site.
- If chemical materials are used in the confined space, the manufacturer's SDS must be attached to the permit.

Non-Entry Extraction of Confined Space Entrant(s)

Should it become necessary to extract personnel from a confined space, it is essential that all personnel involved know exactly what to do and what not to do. There have been several instances where persons who were trying to rescue an individual in a confined space also became victims because of failure to follow the proper procedures. The Attendant may retrieve a victim wearing a retrieval line from a confined space if this is possible without additional help and does not require entry by the Attendant. Typical retrieval/extraction equipment includes tripod, wincher (mechanical lifting device), retrieval line, and body harness. Retrieval equipment is not required for non-permit confined spaces; however, strong consideration should be given to spaces which present unique rescue difficulty due to location (such as remote areas), space configuration, or other elements.

The hazards that may be introduced by work performed in a confined space include the following:

1. Oxygen deficient atmospheres (Less than 19.5%)
2. Oxygen enriched atmospheres (Greater than 23.5%)
3. Atmospheres containing flammable gas or dust
4. Atmospheres containing toxic substances or biological hazards
5. Mechanical or physical hazards

II. **CONFINED SPACE EMERGENCY: ENTRY RESCUE:** Kirtland Fire and Emergency Services provides entry rescue/responder service for confined spaces at Sandia/NM.

- **PRIMARY: Contact: EMCC (24-hours, 7 days a week) PHONE: 844-0911 from a cellular phone; or 911 from a Sandia phone**

APPENDIX D. ELECTRICAL JOB AID FOR CONTRACTORS

Date: _____ Location: _____Name:_____

The purpose of the Electrical Job Aid is to assist contractor superintendents and foremen in ensuring readiness for application of electrical safety LOTO requirements by electrical contractors and manufacturer's representatives. Use of the tool will promote hazard awareness, increased understanding of specific LOTO application requirements, and a questioning attitude at the work site, which will reduce the number and severity of electrical incidents.

☐ Qualified Person(s) is trained to NFPA 70E and the specific hazards and controls presented by the planned work.

☐ Work scope is clear and aligned with outage documentation, as applicable.

☐ Sandia construction electrical inspection has been notified of the planned work.

☐ Required documentation is available and on-site (e.g., outage notice).

- All sources that require LOTO have been verified.

☐ The Electrical Subcontractor is knowledgeable and can determine simple/complex LOTO.

☐ If complex LOTO, is the required documentation on-site and filled out?

☐ The Electrical Subcontractor is knowledgeable and can determine the PPE requirements per Arc-Flash Labeling, Quick Reference Card, or approved method NFPA 70E. NOTE: If Arc flash label is missing, contact Electrical Safety group or Facilities Engineering for assistance.

☐ The pre-task plan is completed, and all workers understand the hazards, steps, and controls for the job at this time.

☐ Required PPE and insulated tools are on-site.

☐ The Limited Approach Boundary has been established and marked where required.

- Boundary established (e.g., barricades, signage, and attendees) where unqualified persons could be present
- Two-person rule/emergency plans understood

☐ The Qualified Person has established an Electrically Safe Working Condition (ESWC) with an approved tester reading zero volts (Live-Dead-Live is always required).

1. Required PPE is being donned.
2. Test a known energized source (test equipment verification).
3. Test exposed electrical circuiting within work boundary to verify zero voltage for ESWC.
4. Retest for zero voltage when conditions change that could impact LOTO integrity or if the job location has been left unattended.

☐ Pre-task plan enables work within the controls.

- Stay within the LOTO Safe Zone.
- Watch for look-alike equipment.
- Redo Integrated Safety Management for any scope change.

☐ Instructions for re-energizing circuit: (Qualified Person)

1. Verify that the task is complete.
2. Verify that all tools are accounted for.
3. Make sure all protective covers are installed and secure.

4. Perform any housekeeping.
5. Ensure that the work boundary remains clear from personnel during re-energization.
6. Remove LOTO.
7. Wear required PPE.
8. Re-energize the electrical circuit.
9. Test for verification of correct voltage and operation.

Name of the Electrical Subcontractor/Qualified Person	Date	Time

APPENDIX E. RESPIRABLE CRYSTALLINE SILICA IN CONSTRUCTION GUIDE: ENGINEERING CONTROLS, WORK PRACTICES, AND RESPIRATORY PROTECTION

This guide was developed by Sandia industrial hygienists to comply with the 2016 ACGIH TLV of 25 ug/m^3 for respirable crystalline silica—the DOE-adopted exposure limit. Sandia workforce members are required to comply with this guidance.

Sandia construction contractors are encouraged to follow this guidance or to explain how they will control silica dust, as well as how they selected respiratory protection for the task at hand. Use of this guide shall be noted on the PTP—include the numerical reference to the equipment and controls that will be used. Use of this guide will not require an AHA for silica controls unless the activity is *not* identified in the guide. This guide is based on Table 1 of the OSHA Construction Standard for Respirable Crystalline Silica, 29 CFR 1926.1153, but is more protective to meet the lower ACGIH TLV of 25 ug/m^3.

All respiratory protection must be National Institute for Occupational Safety and Health (NIOSH) approved and maintained in accordance with manufacturer's instructions. Filtering-facepiece respirators may be N/R/P and 95/99/100—all combinations meet APF 10 criteria (for example, an N95 or a P100 are both suitable selections). Comply with all requirements of the OSHA Respiratory Protection standard (29 CFR 1910.134) for the mandatory use of respirators.

Both are APF 10

Using a respirator with a higher assigned protection factor (APF) than that prescribed is always allowed. For example, it is acceptable to wear a full facepiece respirator (APF 50) where a powered air purifying respirator (APF 25) is prescribed.

It is critical that all dust engineering controls are properly maintained and working. Respiratory protection is in addition to these engineering controls and must not be used as the sole means of reducing exposures to respirable crystalline silica.

HEPA vacuums should be fitted with liner bags that can be closed and lifted out of the vacuum to avoid creating airborne dust. Vacuums should be emptied frequently. HEPA filters should be washed in water or replaced with new ones; never tap a filter to remove dust from it.

OSHA requires a **Competent Person** to be identified for all work involving potential exposures to silica (indicate who this is on the PTP). The **Competent Person** has the training and experience to identify silica hazards in the workplace and the authorization to take prompt corrective measures to eliminate or minimize them. The **Competent Person** regularly inspects the job site, materials, and equipment to ensure that all engineering, work practice, and respiratory protection controls are effective in controlling exposures to crystalline silica.

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
(i) Stationary masonry saws 	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	 **APF 10**	 **APF 10**
(ii) Handheld power saws (any blade diameter) 	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	–When used outdoors	 **APF 10**	 **APF 10**
	–When used indoors or in an enclosed area[1]	 **APF 10**	 **APF 25**
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8 in. or less) 	• For tasks performed outdoors only: ○ Use saw equipped with commercially available dust collection system. ○ Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. ○ Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	**None**	 **APF 10**
(iv) Walk-behind saws	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade.		

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
	• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	–When used outdoors	 **APF 10**	 **APF 10**
	–When used indoors or in an enclosed area[2]	 **APF 25**	 **APF 25**
(v) Drivable saws 	• For tasks performed outdoors only: ○ Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	 **APF 10**	 **APF 10**
(vi) Rig-mounted core saws or drills 	• Use tool equipped with integrated water delivery system that supplies water to cutting surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	 **APF 10**	 **APF 10**
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills) 	• Engineering controls not required for installing screws or anchors in masonry, or concrete if hole size is 5/8 in. or less and number of holes is less than 30 (activity added by Sandia).	**None**	 **APF 10**
	• Use drill equipped with commercially available shroud or cowling with dust collection system. • Operate and maintain tool in accordance with	 **APF 10**	

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
	manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. • Use a HEPA-filtered vacuum when cleaning holes.		**APF 25**
(viii) Dowel drilling rigs for concrete 	• For tasks performed outdoors only: ○ Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	 **APF 10**	 **APF 50**
(ix) Vehicle-mounted drilling rigs for rock and concrete 	• Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.	 **APF 10**	 **APF 25**
	OR		
	• Operate from within an enclosed cab and use water for dust suppression on drill bit.	**None**	 **APF 10**
(x) Jackhammers and handheld powered chipping tools 	• Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact:		
	–When used outdoors	 **APF 25**	 **APF 50**
	–When used indoors or in an enclosed area	 **APF 50**	 **APF 50**

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
	OR		
	• Use tool equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism:		
	–When used outdoors	 **APF 25**	 **APF 50**
	–When used indoors or in an enclosed area	 **APF 50**	 **APF 50**
(xi) Handheld grinders for mortar removal (i.e., tuckpointing) 	• Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 ft^3 per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	 **APF 50**	 **APF 50[3]**
(xii) Handheld grinders for uses other than mortar removal	• For tasks performed outdoors only: ○ Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface.	 **APF 10**	 **APF 10**

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
	○ Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		
	OR		
	• Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 cfm or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism:		
	–When used outdoors	 **APF 10**	 **APF 10**
	–When used indoors or in an enclosed area	 **APF 25**	 **APF 25**
(xiii) Walk-behind milling machines and floor grinders 	• Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	 **APF 10**	 **APF 25**
	OR		
	• Use machine equipped with dust collection system recommended by the manufacturer. • Operate and maintain tool in accordance with	 **APF 10**	 **APF 10**

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
	manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. • When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.		
(xiv) Small drivable milling machines (less than half-lane) 	• Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions.	 **APF 10**	 **APF 10**
(xv) Large drivable milling machines (half-lane and larger) 	• For cuts of any depth on asphalt only: ○ Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. ○ Operate and maintain machine to minimize dust emissions.		
	• Operator	 **APF 10**	 **APF 10**
	• Tender (ground crew)	 **APF 10**	 **APF 25**
	• For cuts of 4 in. in depth or less on any substrate: ○ Use machine equipped with exhaust ventilation on	 **APF 10**	 **APF 10**

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
	drum enclosure and supplemental water sprays designed to suppress dust. ○ Operate and maintain machine to minimize dust emissions.		
	OR		
	• Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions.	 **APF 10**	 **APF 10**
(xvi) Crushing machines 	• Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). • Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. • Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station	 **APF 10**	 **APF 25**
(xvii) Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials 	• Operate equipment from within an enclosed cab.	**None**	 **APF 10**
	• Some equipment used does not have enclosed cabs (activity added by Sandia).	 **APF 10**	 **APF 10**
	• When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	 **APF 10**	 **APF 10**

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
(xviii) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials 	• Apply water and/or dust suppressants as necessary to minimize dust emissions.	 **APF 10**	 **APF 10**
	OR		
	• When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	**None**	 **APF 10**
(xix) Installing or removing drywall (gypsum board) (activities added by Sandia; originally published by OSHA) 	<u>Applying Joint Compound</u> • Use low-silica joint compounds when available. • Use a wet sponge sander or other wet method to smooth joint compound	**None**	**None**
	<u>Cutting drywall (gypsum board)</u> • Install low-silica drywall. • Use a sharp blade to score the drywall to break it along the score and then cut the backing with a sharp blade. • Use a drywall hand saw to create cutouts. Mist water on the area to be sawed. • If sawing overhead, position the body so that it is not below the area being sawed. • Use a HEPA vacuum or wet methods to clean up the dust If using a power tool, refer to the appropriate row in this table (iii).	**None**	**None**

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
	Dry Sanding • Position the body so that it is not below the area being sanded. • Use tool equipped with commercially available shroud and dust collection system. ○ Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. • If the pole sander is not equipped with a commercially available dust collection system, all workers in close proximity to the sanding operation are required to wear a respirator. • Use a HEPA vacuum or wet methods to clean up the dust.	 **APF 10**	 **APF 10**
(xx) Mixing mortar, plaster, or concrete (activities added by Sandia; originally published by OSHA)  	• When loading bulk bags into silos, use shrouds/aprons to contain dust as mix moves from the bag into the silo. Use shroud between the silo and the mixer. • If adding bags of dusty material to a mixer that does not have a silo: ○ Place bag on grate, tip bag up and slit bag, back away and stand upwind, leave on grate to gravity feed, carefully lift bag to remove, fold bag to cover slit, put in trash bag. • Locate mixer so that it is downwind of job site to prevent dust from impacting other employees or people in the vicinity.	 **APF 10**	 **APF 10**

Equipment/Task	Engineering and Work Practice Control Methods	Sandia	
		≤ 4 hr/shift	> 4 hr/shift
(xxi) Demolition of plaster coatings and masonry walls using sledgehammers and other manual methods (activity added by Sandia; originally published by OSHA) 	• If using power tools or heavy equipment, follow the guidance for each tool or heavy equipment as provided in this table. • For sledgehammers, wet down surfaces using hoses and sprayers.		
	–When demolishing outer walls from the outside	 **APF 10**	 **APF 10**
	–When demolishing walls inside or from the inside	 **APF 10**	 **APF 25**

[1] Increased protection for > 4 hr to match cart-mounted saw of same type.
[2] DOE-prescribed APF 25 to both < 4 hr and > 4 hr
[3] Max sample result required use of APF1000 but Sandia results supported APF 50

APPENDIX F. PRE-TASK PLANNING CHECKLISTS

A pre-task plan (PTP) is to be developed and used in identifying hazards and controls of planned work activities. To assist in the development of these PTPs, checklists were created that contain the pertinent information that shall be documented in the developed PTP. These templates are *examples* of what the PTP checklists should look like.

Sandia National Laboratories	**General/Prime Contractor Daily Pre-Task Planning Checklist**	**Company CSSP On-site** (required) ☐ **Sandia 013523 On-site** (required) ☐

Company Name:	Project Name:	Location (BLDG/Rm):	Date:
EMERGENCY INFORMATION		Emergency #: 844-0911, non-Emergency #: 844-0311	
Emergency Phone Location(s):	Nearest Fire Extinguisher: / Nearest Eye Wash/Shower:	Muster Point:	
Step 1: Project Information	PTP Completed By (Print):	Superintendent/Foreman (Print):	
Project/PO Number:	Do you have your work site identification (job board) in a prominent location? ☐ Yes ☐ No Has a pre-job briefing with crew been held? ☐ Yes ☐ No	Start Time: End Time:	
Crew Size:	Have inspectors been contacted? ☐ Yes ☐ No A/C/S Electrical Mechanical/plumbing	Competent person required? ☐ Yes ☐ No Inspection performed? ☐ Yes ☐ No ☐ Excavation ☐ Scaffolding ☐ Hoisting/Rigging ☐ Silica ☐ Fall Protection	
Are subcontractors on-site? ☐ Yes ☐ No If so, has pre-job briefing been held with subcontractors? ☐ Yes ☐ No	List Subcontractors: _____ _____ _____ _____		

Step 2: Scope of the Work

What is the task?

Work Activities	Hazards Associated with the Task	Controls/Mitigations (Hierarchy of Controls)

Step 3: Permits

Has the scope of work of any permits changed? ☐ Yes ☐ No Are permits on-site and current? ☐ Yes ☐ No	☐ JSHE ☐ Hot Work ☐ Confined Space ☐ Excavation ☐ Penetration ☐ Fugitive Dust ☐ Surface Discharge ☐ Biological Survey	☐ Approved Lift Plan ☐ AHA: Activity Hazard Analysis ☐ Spotting of Utilities ☐ Hand Dig/Pot-Hole to Expose Utility Lines (5 ft) ☐ Utility Outage Request ☐ Fire Protection Impairment

Step 4: Required Inspections	Inspected By	**Step 5: Pre-Task Details**	
☐ Scaffolding Pre-use		Is energized electrical work required? ☐ Yes ☐ No ☐ N/A	
☐ Ladder(s)		Are required Facilities' LOTO in place? ☐ Yes ☐ No ☐ N/A	
☐ Heavy Equipment (forklift, aerial lift, etc.)		Are required LOTOs in place? ☐ Yes ☐ No ☐ N/A	Simple (one energy source) ☐ Complex (multiple sources, crews, crafts, locations, employers, disconnects, work periods, particular sequence) ☐
☐ Cords/GFCIs/ Housekeeping			
☐ Tools and Equipment		Person In Charge:	
☐ Hoisting and Rigging		Electrical ☐	Pneumatic ☐
☐ Fall Protection Pre-use		Mechanical ☐	Chemical ☐
☐ Other:		Hydraulic ☐	Thermal ☐

Step 6: Identify Hazards Associated with Task

Worker Exposure to:		Work Environment:
☐ Asbestos/Lead	☐ Falls/Working on Ladders, Roofs	☐ Excavation/Trench
☐ Chemicals	☐ Confined Space	☐ Weather/Temperature Extremes
☐ Energized Electrical Systems	☐ Heavy Lifting/Strenuous, < 35 lbs.	☐ Low Lighting
☐ Hot Work	☐ Falls From/Into	☐ Others working in Same Space
☐ Noise >85 dB	☐ Congested Area	☐ Traffic Control
☐ Pinch Points	☐ Overhead Work/Falling Objects	☐ Barricading
☐ Silica	☐ Blind Hazard Penetration	☐ Slip/Trip
☐ Hazardous Energy Sources	☐ Flame/Spark Hazard	☐ Overhead Power Lines/Pipes/etc.
☐ Sharp or Protruding Objects	☐ Hand/Eye Injuries	☐ Work at Heights > 6 ft
☐ Line of Fire		☐ Crane/Hoisting/Rigging

Step 7: Identify PPE or Safety Equipment

☐ Hard Hat	☐ Di-Electric Boots/Gloves	☐ Respiratory Protection
☐ Hand Protection (chemical, cut resistant)	☐ Safety Glasses (Z87/side shields)	☐ Face Shield/Eye Wash (silica exposure, if necessary)
☐ Hearing Protection	☐ Fall Protection Equipment	☐ Shoring/Benching/Sloping
☐ Foot Protection (metatarsal, hard toe)	☐ GFCI	☐ Review SDS
☐ Hi-visibility Clothing	☐ Tyvek Coveralls	☐ Fire Extinguisher

Is there something different or unique today about site conditions that would increase the hazards? ☐ Yes ☐ No
Is there something different or unique today about the process or personnel that would increase the hazards? ☐ Yes ☐ No

Step 8: Crew members are required to understand the above, then print and sign in a space below

Print	Signature	Print	Signature

Step 9: Post Task: All answers must be YES before leaving the area.

Is the area clean and clutter free? (Ladders, material, tools, trash stored properly.) ☐ Yes ☐ No
Is the area in a safe state? (All energies isolated via LOTO.) ☐ Yes ☐ No
Are all barricades and hazard signs current and in proper place or removed as needed? ☐ Yes ☐ No
VERIFIED BY: DATE:

PTP is required for all activity-level work including mobilization and de-mobilization.

IF WORK CONDITIONS/ACTIVITIES CHANGE, WORK MUST PAUSE AND PRE-TASK PLAN BE REASSESSED.
DUPLICATED COPIES ARE NOT ALLOWED. PLEASE USE ORIGINAL FORMS.

Foreman Print/Signature: _____

Foreman Contact Number(s): _____

Sandia National Laboratories	**Mechanical/Plumbing Contractor Daily Pre-Task Planning Checklist**	**Company CSSP On-site** (required) ☐ **Sandia 013523 On-site** (required) ☐

Company Name:	Project Name:	Location (BLDG/Rm):	Date:
EMERGENCY INFORMATION		Emergency #: 844-0911, non-Emergency #: 844-0311	
Emergency Phone Location(s):	Nearest Fire Extinguisher:	Nearest Eye Wash/Shower:	Muster Point:

Step 1: Project Information	PTP Completed By (Print):	Superintendent/Foreman (Print):

Project/PO Number:	Do you have your work site identification (job board) in a prominent location? ☐ Yes ☐ No Has a pre-job briefing with crew been held? ☐ Yes ☐ No	Start Time: End Time:
Crew Size:	Have inspectors been contacted? ☐ Yes ☐ No • A/C/S • Electrical • Mechanical/Plumbing	Competent person required? ☐ Yes ☐ No Inspection performed? ☐ Yes ☐ No ☐ Excavation ☐ Scaffolding ☐ Hoisting/Rigging ☐ Silica ☐ Fall Protection
Are subcontractors on-site? ☐ Yes ☐ No If so, has pre-job briefing been held with subcontractors? ☐ Yes ☐ No	List Subcontractors: _____ _____ _____ _____	

Step 2: Scope of the Work

What is the task?

Work Activities	Hazards Associated with the Task	Controls/Mitigations (Hierarchy of Controls)

Step 3: Permits

Has the scope of work of any permits changed? ☐ Yes ☐ No Are permits on-site and current? ☐ Yes ☐ No	☐ JSHE ☐ Hot Work ☐ Confined Space ☐ Excavation ☐ Penetration ☐ Fugitive Dust ☐ Surface Discharge ☐ Biological Survey	☐ Approved Lift Plan ☐ AHA: Activity Hazard Analysis ☐ Spotting of Utilities ☐ Hand Dig/Pot-Hole to Expose Utility Lines (5 ft.) ☐ Utility Outage Request ☐ Fire Protection Impairment

Step 4: Required Inspections	Inspected By:	**Step 5: Mechanical/Plumbing**	
☐ Scaffolding Pre-use		Are required Facilities' LOTO in place? ☐ Yes ☐ No ☐ N/A	
☐ Ladder(s)		Are required LOTOs in place? ☐Yes ☐No ☐N/A (electrical, mechanical, hydraulic, pneumatic, chemical, thermal) Person in Charge:	Simple (one energy source) ☐ Complex (multiple sources, crews, crafts, locations, employers, disconnects, work periods, particular sequence) ☐
☐ Heavy Equipment (forklift, aerial lift, etc.)			
☐ Fall Protection Pre-use		Fire Protection Impairment (hot work near alarms/sprinkler heads) ☐ Yes ☐ No ☐ N/A	
☐ Tools and Equipment		☐ Inspection of work area (hidden hazards)	Thermal
☐ Hoisting and Rigging		☐ Moving parts (crushing, puncture, caught in)	gas/liquid (> 120°) ☐
☐ Housekeeping, Cords, GFCIs		☐ Pneumatic/Hydraulic (> 600 psi)	heat (> 140°) ☐
☐ Other:		☐ Domestic water (> 150 psig)	cold (< 27°) ☐

Step 6: Identify Hazards Associated with Task

Worker Exposure to:		**Work Environment:**
☐ Asbestos/Lead	☐ Falls/Working on Ladders, Roofs	☐ Excavation/Trench
☐ Chemicals	☐ Confined Space	☐ Weather/Temperature Extremes
☐ Energized Electrical Systems	☐ Heavy Lifting/Strenuous, < 35 lbs.	☐ Low Lighting
☐ Hot Work	☐ Falls From/Into	☐ Others working in Same Space
☐ Noise > 85 dB	☐ Congested Area	☐ Traffic Control
☐ Pinch Points	☐ Overhead Work/Falling Objects	☐ Barricading
☐ Silica	☐ Blind Hazard Penetration	☐ Slip/Trip
☐ Hazardous Energy Sources	☐ Flame/Spark Hazard	☐ Overhead Power Lines/Pipes/etc.
☐ Sharp or Protruding Objects	☐ Hand/Eye Injuries	☐ Work at Heights > 6 ft
☐ Line of Fire		☐ Crane/Hoisting/Rigging

Step 7: Identify PPE or Safety Equipment

☐ Hard Hat	☐ Foot Protection (metatarsal, hard toe)	☐ Fall Protection Equipment
☐ High-visibility Clothing	☐ Safety Glasses (Z87/side shields)	☐ Review SDS
☐ Hearing Protection	☐ GFCI	☐ Fire Extinguisher
☐ Di-Electric Boots/Gloves	☐ Hand Protection (chemical, cut resistant)	☐ Face Shield/Eye Wash (silica exposure, if necessary)

Is there something different or unique today about site conditions that would increase the hazards? ☐ Yes ☐ No
Is there something different or unique today about the process or personnel that would increase the hazards? ☐ Yes ☐ No

Step 8: Crew members are required to understand the above, then print and sign in space below

Print	Signature	Print	Signature

Step 9: Post Task: All answers must be YES before leaving the area.

Is the area clean and clutter free? (Ladders, material, tools, trash stored properly.) ☐ Yes ☐ No

Is the area in a safe state? (All energies isolated via LOTO.) ☐ Yes ☐ No

Are all barricades and hazard signs current and in proper place or removed as needed? ☐ Yes ☐ No

VERIFIED BY: **DATE:**

PTP is required for all activity-level work including mobilization and de-mobilization.

IF WORK CONDITIONS/ACTIVITIES CHANGE, WORK MUST PAUSE AND PRE-TASK PLAN BE REASSESSED.
DUPLICATED COPIES ARE NOT ALLOWED. PLEASE USE ORIGINAL FORMS.

Foreman Print/Signature: _____

Foreman Contact Number(s): _____

Sandia National Laboratories	**Electrical Contractor Daily Pre-Task Planning Checklist**	**Company CSSP On-site** (required) ☐ **Sandia 013523 On-site** (required) ☐

Company Name:	Project Name:	Location (BLDG/Rm):	Date:
EMERGENCY INFORMATION		Emergency #: 844-0911, non-Emergency #: 844-0311	
Emergency Phone Location(s):	Nearest Fire Extinguisher:	Nearest Eye Wash/Shower:	Muster Point:

Step 1: Project Information	PTP Completed By (Print):	Superintendent/Foreman (Print):
Project/PO Number:	Do you have your work site identification (job board) in a prominent location? ☐ Yes ☐ No Has a pre-job briefing with crew been held? ☐ Yes ☐ No	Start Time: End Time:
Crew Size:	Have inspectors been contacted? ☐ Yes ☐ No • A/C/S • Electrical • Mechanical/Plumbing	Competent person required? ☐ Yes ☐ No Inspection performed? ☐ Yes ☐ No ☐ Excavation ☐ Scaffolding ☐ Hoisting/Rigging ☐ Silica ☐ Fall Protection
Are subcontractors on-site? ☐ Yes ☐ No If so, has pre-job briefing been held with subcontractors? ☐ Yes ☐ No	List Subcontractors: _____ _____ _____ _____	

Step 2: Scope of the Work

What is the task?

Work Activities	Hazards Associated with the Task	Controls/Mitigations (Hierarchy of Controls)

Step 3: Permits

Has the scope of work of any permits changed? ☐ Yes ☐ No
Are permits on-site and current? ☐ Yes ☐ No

- ☐ JSHE
- ☐ Hot Work
- ☐ Confined Space
- ☐ Excavation
- ☐ Penetration
- ☐ Fugitive Dust
- ☐ Surface Discharge
- ☐ Biological Survey
- ☐ Approved Lift Plan
- ☐ AHA: Activity Hazard Analysis
- ☐ Spotting of Utilities
- ☐ Hand Dig/Pot-Hole to Expose Utility Lines (5 ft)
- ☐ Utility Outage Request
- ☐ Fire Protection Impairment

Step 4: Required Inspections	Inspected By:	**Step 6: LOTO Requirements**	
☐ Scaffolding Pre-use		Is energized electrical work required?	☐ Yes ☐ No
☐ Heavy Equipment (forklift, aerial lift, etc.)		Are required Facilities' LOTO in place?	☐ Yes ☐ No ☐ N/A
☐ Ladder(s)		Are required LOTOs in place?	☐ Yes ☐ No ☐ N/A
☐ Cords/GFCIs/ Housekeeping		Local outage?	☐ Yes ☐ No
☐ Tools and Equipment		Simple (one energy source)	☐
☐ Hoisting and Rigging		Complex (see below)	☐

☐ Fall Protection Pre-use		
☐ Other:		

Step 5: Arc Flash Assessment

Panel #	Arc Flash Boundary	PPE Category

Person in Charge:

- ☐ Multiple Energy Sources
- ☐ Multiple Crews
- ☐ Multiple Crafts
- ☐ Multiple Locations
- ☐ Multiple Employers
- ☐ Multiple Disconnecting Means
- ☐ Particular Sequences
- ☐ Continues more than one work period

Step 7: Identify Hazards Associated with Task

Worker Exposure to:

- ☐ Asbestos/Lead
- ☐ Chemicals
- ☐ Energized Electrical Systems
- ☐ Hot Work
- ☐ Noise > 85 dB
- ☐ Pinch Points
- ☐ Silica
- ☐ Hazardous Energy Sources
- ☐ Sharp or Protruding Objects
- ☐ Line of Fire
- ☐ Falls/Working on Ladders, Roofs
- ☐ Confined Space
- ☐ Heavy Lifting/Strenuous, < 35 lbs.
- ☐ Falls From/Into
- ☐ Congested Area
- ☐ Overhead Work/Falling Objects
- ☐ Blind Hazard Penetration
- ☐ Flame/Spark Hazard
- ☐ Hand/Eye Injuries

Work Environment:

- ☐ Excavation/Trench
- ☐ Weather/Temperature Extremes
- ☐ Low Lighting
- ☐ Others Working in Same Space
- ☐ Traffic Control
- ☐ Barricading
- ☐ Slip/Trip
- ☐ Overhead Power Lines/Pipes/etc.
- ☐ Work at Heights > 6 ft
- ☐ Crane/Hoisting/Rigging

Step 8: Identify PPE or Safety Equipment

- ☐ Hard Hat
- ☐ Hand Protection (chemical, cut resistant)
- ☐ Hearing Protection
- ☐ Foot Protection (metatarsal, hard toe)
- ☐ High-visibility Clothing
- ☐ Di-Electric Boots/Gloves
- ☐ Safety Glasses (Z87/side shields)
- ☐ GFCI
- ☐ Voltage Rated Tools
- ☐ Arc Flash Clothing
- ☐ Fall Protection Equipment
- ☐ Review SDS
- ☐ Fire Extinguisher
- ☐ Face Shield/Eye Wash (silica exposure, if necessary)

Is there something different or unique today about site conditions that would increase the hazards? ☐ Yes ☐ No

Is there something different or unique today about the process or personnel that would increase the hazards? ☐ Yes ☐ No

Step 9: Crew members are required to understand the above, then print and sign in space below

Print	Signature	Print	Signature

Step 10: Post Task: All answers must be YES before leaving the area.

Is the area clean and clutter free? (Ladders, material, tools, trash stored properly.)	☐ Yes ☐ No
Is the area in a safe state? (All energies isolated via LOTO).	☐ Yes ☐ No
Are all barricades and hazard signs current and in proper place or removed as needed?	☐ Yes ☐ No
VERIFIED BY:	**DATE:**

PTP is required for all activity-level work including mobilization and de-mobilization.

IF WORK CONDITIONS/ACTIVITIES CHANGE, WORK MUST PAUSE AND PRE-TASK PLAN BE REASSESSED.
DUPLICATED COPIES ARE NOT ALLOWED. PLEASE USE ORIGINAL FORMS.

Foreman Print/Signature: _____

Foreman Contact Number(s): _____

Sandia National Laboratories	**Civil Contractor Daily Pre-Task Planning Checklist**	**Company CSSP On-site** (required) ☐ **Sandia 013523 On-site** (required) ☐	
Company Name:	Project Name:	Location (BLDG/Rm):	Date:
EMERGENCY INFORMATION		Emergency #: 844-0911, non-Emergency #: 844-0311	
Emergency Phone Location(s):	Nearest Fire Extinguisher:	Nearest Eye Wash/Shower:	Muster Point:

Step 1: Project Information	PTP Completed By (Print):	Superintendent/Foreman (Print):
Project/PO Number:	Do you have your work site identification (job board) in a prominent location? ☐ Yes ☐ No Has a Pre-Job Briefing with crew been held? ☐ Yes ☐ No	Start Time: End Time:

Crew Size:	Have inspectors been contacted? ☐ Yes ☐ No • A/C/S • Electrical • Mechanical/Plumbing	Competent person required? ☐ Yes ☐ No Inspection performed? ☐ Yes ☐ No ☐ Excavation ☐ Scaffolding ☐ Hoisting/Rigging ☐ Silica ☐ Fall Protection
Are subcontractors on-site? ☐ Yes ☐ No If so, has pre-job briefing been held with subcontractors? ☐ Yes ☐ No	List Subcontractors: _____ _____ _____ _____	

Step 2: Scope of the Work

What is the task?

Work Activities	Hazards Associated with the Task	Controls/Mitigations (Hierarchy of Controls)

Step 3: Permits

Has the scope of work of any permits changed? ☐ Yes ☐ No Are permits on-site and current? ☐ Yes ☐ No	☐ JSHE ☐ Hot Work ☐ Confined Space ☐ Excavation ☐ Penetration ☐ Fugitive Dust ☐ Surface Discharge ☐ Biological Survey	☐ Approved Lift Plan ☐ AHA: Activity Hazard Analysis ☐ Spotting of Utilities ☐ Hand Dig/Pot-Hole to Expose Utility Lines (5 ft.) ☐ Utility Outage Request ☐ Fire Protection Impairment

Step 4: Required Inspections	Inspected By:	**Step 6: Excavation Requirements (all soils Type C at Sandia)**	
☐ Scaffolding Pre-use		Are required Facilities' LOTO in place? ☐ Yes ☐ No ☐ N/A	
☐ Heavy Equipment (forklift, aerial lift, etc.)		Are required LOTOs in place? ☐ Yes ☐ No ☐ N/A (electrical, chemical, mechanical, hydraulic, pneumatic, thermal) Person in Charge:	Simple (one energy source) ☐ Complex (multiple: sources, crews, crafts, locations, employers, disconnects, work periods, particular sequence) ☐
☐ Ladder(s)			

☐ Housekeeping, Cords, GFCIs		Excavation > 4 ft ☐ Yes ☐ No Competent Person:	
☐ Tools and Equipment		☐ Exit ladder within 25 ft of personnel	☐ Potential hazardous atmosphere
☐ Hoisting and Rigging		☐ Protection from vehicles	☐ Water accumulation
☐ Fall Protection Pre-use		☐ Overhead loads/equipment	☐ Stability of adjacent structure(s)
☐ Other:		☐ Spoil piles > 2 ft from edge	☐ Equipment at edge of excavation
Step 5: Spotter		☐ Excavation > 5 ft	☐ Shielding w/ trench box
		☐ Sloping (no benching)	☐ Shoring with supports

Step 7: Identify Hazards Associated with Task		
Worker Exposure to:		**Work Environment:**
☐ Asbestos/Lead	☐ Falls/Working on Ladders, Roofs	☐ Excavation/Trench
☐ Chemicals	☐ Confined Space	☐ Weather/Temperature Extremes
☐ Energized Electrical Systems	☐ Heavy Lifting/Strenuous, < 35 lbs.	☐ Low Lighting
☐ Hot Work	☐ Falls From/Into	☐ Others Working in Same Space
☐ Noise > 85 dB	☐ Congested Area	☐ Traffic Control
☐ Pinch Points	☐ Overhead Work/Falling Objects	☐ Barricading
☐ Silica	☐ Blind Hazard Penetration	☐ Slip/Trip
☐ Hazardous Energy Sources	☐ Flame/Spark Hazard	☐ Overhead Power Lines/Pipes/etc.
☐ Sharp or Protruding Objects	☐ Hand/Eye Injuries	☐ Work at Heights > 6 ft
☐ Line of Fire		☐ Crane/Hoisting/Rigging

Step 8: Identify PPE or Safety Equipment		
☐ Hard Hat	☐ Di-Electric Boots/Gloves	☐ Fall Protection Equipment
☐ Hand Protection (chemical, cut resistant)	☐ Safety Glasses (Z87/side shields)	☐ GFCI Face Shield/Eye Wash (silica exposure, if necessary)
☐ Hearing Protection	☐ GFCI	☐ Fire Extinguisher
☐ Foot Protection (metatarsal, hard toe)	☐ High-visibility Clothing	☐ Review SDS

Is there something different or unique today about site conditions that would increase the hazards? ☐ Yes ☐ No
Is there something different or unique today about the process or personnel that would increase the hazards? ☐ Yes ☐ No

Step 9: Crew members are required to understand the above, then print and sign in space below			
Print	Signature	Print	Signature

Step 10: Post Task: All Answers must be YES before leaving the area.	
Is the area clean and clutter free? (Ladders, material, tools, trash stored properly.)	☐ Yes ☐ No
Is the area in a safe state? (All energies isolated via LOTO.)	☐ Yes ☐ No
Are all barricades and hazard signs current and in proper place or removed as needed?	☐ Yes ☐ No
VERIFIED BY:	**DATE:**

PTP is required for all activity-level work including mobilization and de-mobilization.

IF WORK CONDITIONS/ACTIVITIES CHANGE, WORK MUST PAUSE AND PRE-TASK PLAN BE REASSESSED.
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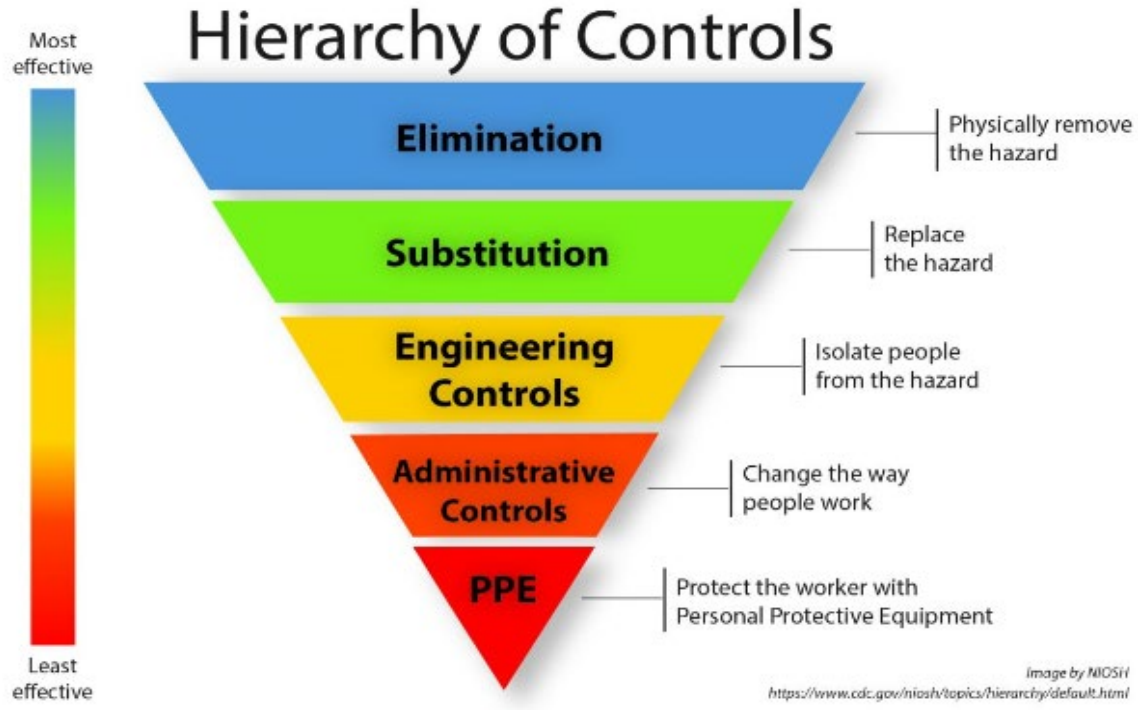
Foreman Print/Signature: _____

Foreman Contact Number(s): _____

APPENDIX G. HIERARCHY OF CONTROLS

In the hazard analysis, one aspect that is addressed is the hierarchy of controls. Below is a hierarchy of controls reference that can be used in the development of hazard analyses. The purpose of this guideline is to promote critical thinking when identifying hazards and controls and of identified work activities. The following table provides some examples to aid in the critical thinking process.



Work Activity	Hazards	Controls				
		Elimination	Substitution	Engineering Controls	Administrative Controls	Personal Protective Equipment (PPE)
Hazardous chemical use	Potential harm (e.g., inhalation, skin irritation, burns) from worker exposure, contact, inhalation, or ingestion of the hazardous chemical	Prohibit or restrict use at the work site.	Replace with less hazardous chemical.	Modify process to reduce exposure (e.g., forced ventilation, containment, fume hood, use of barrel pump vs. pouring, etc.)	Follow SDS, manufacturer's recommendations, limit quantities, establish boundaries, limit exposure time; hazard communication signage, proper storage, decontamination procedures	Chemical resistant gloves, safety glasses, face shield, chemical protective clothing
Abrasive blasting with sand; sawing brick or concrete; sanding or drilling into concrete walls; grinding mortar; cutting or crushing stone	Silica/asbestos inhalation, flying debris	Use alternate tooling to minimize dust and debris hazard.	Use alternate tooling to minimize dust and debris hazard.	Enclosed cab when using heavy equipment, wet methods/HEPA vacuums, shields	Training, procedures, Spec 01 35 23 Appendix E, monitoring, employee rotations/breaks	Respirator (per 01 35 23 Spec Appendix E)
Crane operations, hoisting and rigging	Suspended loads, pinch points, dropped/tipped objects, lifting over occupied areas	Avoid the need for lifting material. Remove personnel from lifting envelope.	Substitute chains for high-quality nylon straps. Reduce the load risk by using lighter weights or more stable containers.	Specially developed, engineered, and tested below-the-hook lifting device. Use spreader beams for long loads.	AHA, lift plan, lift director, signalers, competent person periodic/pre-use inspection of equipment/rigging, training	Hard hats, gloves, high-visibility clothing, safety shoes, eye protection
Demolition operations of concrete, asphalts, other assemblies (penetration > 2 in., not including pre-cast)	Hidden hazards (utilities), silica exposure, noise, falling material, crushing	Remove personnel from demolition envelope.	Substitute manual/locally operated machinery with remotely operated machinery. Use machinery vs.	Wetting concrete, HEPA-filtered dust control, ventilation, closed cab machinery, roll-over protection	Penetration permit, five-step process (drawing review, site investigation, detection using instrumentation, appropriate tools, PPE), AHA , LOTO, prescribe proper manual lifting posture	Respirator (per 01 35 23 Spec Appendix E), hearing protection, hard hats, gloves, high-visibility

Work Activity	Hazards	Controls				
		Elimination	Substitution	Engineering Controls	Administrative Controls	Personal Protective Equipment (PPE)
			manual handling of debris.			clothing, safety shoes
Duct bank penetrations (> 50 volts)	Hidden hazards (utilities), silica exposure	Disconnect and pull (if possible) utilities from duct bank.	Create new run.	Use of penetration depth stops. Wetting concrete, HEPA-filtered dust control, ventilation.	Sandia review for high voltage, penetration permit, five-step process (drawing review, site investigation, detection using instrumentation, appropriate tools, PPE)	Respirator (per 01 35 23 Spec Appendix E), hearing protection, hard hats, gloves, hi-visibility clothing, safety shoes
Environmental operations (surface disturbance > 3/4 acre, surface preparation, demo of > 75,000 ft^3)	Stormwater impacts/soil erosion, dust, earth collapse, radon, struck by machinery		Use closed vs. open cab excavators.	Waddles, bales, inlet protection, wetting of dry soil, engineering assessment of soil stability, drain excessive moisture from soil, Industrial Hygiene air quality evaluation	Fugitive Dust Permit, storm water control, bird nesting sites, sanitary sewer discharge, surface discharge	Respirators, gloves, hearing and eye protection, safety shoes
Excavations (> 12 in. in depth, within 5 ft of known utilities, personnel entry into excavation > 5 ft, 2 in. under sidewalks/slabs/asphalt, beneath building slab, previously undisturbed soil)	Potential for collapse of sides, material falling onto people, falls into, nearby vehicles/buildings, hazardous atmosphere		Use underground cable laying machine to avoid creating an open trench.	Shielding (trench box), sloping (no benching), shoring with supports, barriers (fences or barricades), fall protection	Excavation permit, AHA, five-step process (drawing review, site investigation, detection using instrumentation, appropriate tools, PPE), competent person inspection, spotter(s), equipment away from sides, spoil piles away	Hard hat, safety glasses, high-visibility clothing, gloves, safety shoes

Work Activity	Hazards	Controls				
		Elimination	Substitution	Engineering Controls	Administrative Controls	Personal Protective Equipment (PPE)
					from sides, hand dig within 5 ft of utilities, utility outage	
Heavy equipment (forklifts, excavator, backhoe)	Electrical, crushing, being struck by equipment/material, run over by vehicle, dust		Enclosed cab vs. open cab equipment	Wet methods, barriers, roll-over protection	Training, daily pre-use inspections	High-visibility clothing, hard hats, gloves, safety shoes
Hot work	Sparks, flames, excessive heat, molten metal, fumes and vapors, toxic gases, electrical shock, noise, inadvertent activation of fire protection systems	Use alternate means for joining (such as prepress) and/or cutting (non-spark producing pipe cutter).	Use alternate means for joining (such as prepress) and/or cutting (non-spark producing pipe cutter).	Thermal barriers, wetting area, forced air ventilation	Hot work permit, training (hot work/fire watch/fire extinguisher), removing combustibles from the area	Respiratory protection, eye and face protection, protective clothing, foot protection, hand protection, hearing protection
Installing conduit/ductwork	Falls, struck by, sharp edges, blind reaching, dead end cables, hidden hazards, electrical shock	Physically disconnect power source from work area.		Safety anchor point; if authorized in the area/building, use wireless technology for control and communications systems	Penetration permit, pre-inspection of work area, AHA (if site investigation cannot identify all potential hidden hazards), training	Cut-resistant gloves
Manual handling and lifting of material	Musculoskeletal injuries, strains	Eliminate by re-arranging materials to minimize reaching.	Use mechanized lifting, conveyers.	Lift device, re-design equipment (e.g., handles for easy gripping)	Training, work scheduling to reduce repetition to minimize overtime which causes fatigue	Hard hats, gloves, safety shoes, eye protection, lifting belts

Work Activity	Hazards	Controls				
		Elimination	**Substitution**	**Engineering Controls**	**Administrative Controls**	**Personal Protective Equipment (PPE)**
Scaffolding	Slipping, tripping, falling, collapse from overweight/wind	Use plant equipment at ground level, lowering object to the ground.	Use aerial lifts.	Fall restraint systems	Competent person daily inspection, procedures, training, rescue plan, communication methods	Safety belts, body harness, hard hats
Welding/Cutting/Brazing	Heat, fire, exposure to fumes and gases, electric shock, noise hazards, exposure to UV and IR radiation, burns	Use alternate means for joining (such as prepress) and/or cutting (non-spark producing pipe cutter).		Local exhaust ventilation	Hot work permit, training, housekeeping	Fire/electricity resistant clothing, welding gloves, aprons, boots
Work in confined spaces	Oxygen deficiency, oxygen enrichment, flammable/explosive atmospheres, excessive heat, physical hazards	Eliminate/remove rotating/electrical hazards if possible through LOTO/bracing.	Perform confined space work remotely (i.e., robotically). Perform as much of the work as possible externally to the confined space. Replace toxic substances with less toxic or non-toxic ones to avoid creating hazardous atmospheres.	Forced air ventilation. Design or redesign a confined work space so that a hazardous atmosphere can't develop.	AHA (permit required confined spaces), confined space entry procedures, confined space program, SAE, confined space permit, contact EMCC, communication methods, escape plan	SCBA [self-contained breathing apparatus], respirators, gloves, hearing and eye protection

Work Activity	Hazards	Controls				
		Elimination	**Substitution**	**Engineering Controls**	**Administrative Controls**	**Personal Protective Equipment (PPE)**
Work involving electrical hazards (> 50 volts)	Electrocution/shock/arc flash/fires/stored energy	Physically disconnect power source from work area.	Move work area away from overhead electrical lines if possible.	Guarding of conductors/circuit parts to reduce contact or arcing faults, grounding circuits, insulation, circuit protection devices	AHA (energized electrical work/within 10 ft of overhead electrical lines > 50kV), LOTO procedures (simple/complex), training, signage	Shock and arc flash PPE (suits, gloves, hoods) based on NFPA 70E tables
Work on pneumatic (compressed gas bottles) or hydraulic (hydrolancing, pressure washing, work on pressurized systems) pressure systems	Explosion, fire, damage to regulator, water jet injury, projectiles	Isolate/ depressurize equipment prior to work (e.g., double block and bleed), disconnect work area from pressure source prior to work.		Pressure relief valves, spray shields	Proper storage/handling, inspection, capped when not in use, training, LOTO	Gloves, face shield, safety glasses
Working at heights (> 6 ft)	Fall to lower level, slipping, tripping	Use plant equipment at ground level, lowering object to the ground.		Use of scaffolding vs. ladder, harness, guard rails, aerial lifts, fall protection system (positioning or arrest)	Fall protection/rescue plan, AHA (elevated work without fall protection system > 6 ft above lower level or within 15 ft of unprotected edge not including roofers), competent person, rescue plan, communication methods	Safety belts, body harness, hard hats
Working in high temperature environments	Heat exhaustion/stroke/ cramps	Re-schedule work during cooler months.	Move work indoors.	Air conditioning, evaporative coolers (swamp cooler), sun shades, cooling vests	Training, Sandia notifications for heat stress, breaks, monitoring work load on elevated temperature days, modify work schedules, provide	Cooling PPE

Work Activity	Hazards	Controls				
		Elimination	Substitution	Engineering Controls	Administrative Controls	Personal Protective Equipment (PPE)
					adequate water/drinks to employees, LOTO	
Working in traffic area (vehicle/pedestrian)	Struck by vehicle, vehicle crash, pedestrian injury	Detour traffic/ pedestrians.	Move all or some work area to low traffic area.	Barricades (fences or concrete/plastic barricades)	Traffic plan, signage, modify work schedules to lower traffic times, adequate lighting of work area, traffic guides/signalers, communication methods	High-visibility clothing
Working on cold or cryogenic components or systems (liquids and surfaces < 27°F)	Burns, frostbite	Isolate cold/cryogenic source and allow equipment to warm to ambient.		Thermal insulation, spray shields	LOTO, training, signage	Insulating gloves, face shield, safety glasses, long sleeve shirts
Working on or near hot components, liquids, systems, or machinery. Exposure to hot gas/liquid > 120°F/ surfaces > 140°F (surfaces are defined as having no leakage of liquid or gas)	Hot spray, burns	Isolate heat source and allow to cool prior to work.		Thermal insulation, spray shields	LOTO, training, signage	Insulating gloves, face shield, safety glasses, long sleeve shirts
Working on/with ladders	Falls leading to injury, overreaching when working on a ladder, placing ladder on uneven ground	Use plant equipment at ground level, lowering object to the ground.	Use scaffolding, lifts, or other equipment in place of ladder to provide a more stable platform for workers.	Roof access swing gates, fixed ladder guards (to prevent unauthorized access), ladder safety cages	Training, pre-use inspections (checklists), training, four to one rule (ladder placed 1 ft away for every 4 ft of rise), three points of contact	Non-slip shoes, gloves

Work Activity	Hazards	Controls				
		Elimination	Substitution	Engineering Controls	Administrative Controls	Personal Protective Equipment (PPE)
Working over occupied areas	Falling debris	Move work to ground level.	Move work to ground level.	Schedule for non-standard hours, evacuate area underneath and install barricades	Signage, modify work schedule to times where work location is unoccupied, adequate lighting, building notifications, communication methods	Hard hat, safety glasses, high-visibility clothing, gloves, safety shoes, fall protection
Working with asbestos	Inhalation, asbestosis, mesothelioma	Verify work area is asbestos free.		Wetting methods, containments	JSHE, asbestos work release permit, pre-work safety meeting	Respirators, eye protection, safety shoes
Working with power/hand tools	Abrasions, cuts, pinch, debris, struck by	Remote or manual tooling.	Use alternate tooling to minimize hazards.	Guards, safety switches	Pre-use inspection, training, tool operating instructions	Gloves, eye protection, safety shoes

END OF SECTION 01 35 23