Ames Procedural Requirements

APR 8715.1
Effective Date: September 15, 2020
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COMPLIANCE IS MANDATORY

Subject: Chapter 27 – Construction Safety Management

Responsible Office: Code QH / Occupational Safety, Health, and Medical Service Division

CHANGE LOG

Status [Baseline /Revision /Cancelled]	Document Revision	Date of Change	Description
Baseline	0	9/15/2020	Baseline revision of this chapter

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PREFACE

P.1 PURPOSE

a. This chapter provides safety requirements and procedures for all construction (New or Remodeling), alterations, and/or repairs a contractor or subcontractor would perform as per 29 CFR 1926.13(a) through (c) definition of Construction. The chapter also provides the requirements for construction work which, as defined by OSHA 29 CFR 1910.12(b), is any construction, alteration, and/or repair, including painting and decorating of a structure. In order for work to be construction work, the employer need not itself be a construction company. Further, construction work is not limited to new construction; it may include the repair of existing facilities. The replacement of structures and their components is also considered construction work (See OSHA Standard Interpretation 2003-11-18 - Construction vs. Maintenance).

P.2 APPLICABILITY

a. This directive is applicable to ARC and associated facilities, e.g., NASA Research Park.

b. This directive applies contractors, Ames maintenance contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, grants, or agreements.

c. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The terms "may" or "can" denote discretionary privilege or permission, "should" denotes a good practice and is recommended, but not required, "will" denotes an expected outcome, and "are/is" denotes descriptive material.

d. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. Safety and Health Regulations for Construction, 29 CFR 1926

b. Occupational Safety and Health Standards, 29 CFR 1910

c. NPR 8715.1, NASA Safety and Health Programs

P.4 APPLICABLE DOCUMENTS AND FORMS

a. 10 CFR Part 20 Standards for Protection Against Radiation

b. APR 8500.1 Environmental Procedural Requirements

c. APR 8553.1 Environmental Management System

d. APR 8715.1 Chapter 4, Mishap Reporting and Investigating

e. APR 8715.1 Chapter 17, Lifting Devices and Equipment

f. APR 8715.1 Chapter 26, Confined Space Entry

g. APR 8715.1 Chapter 30, Asbestos Management Plan

h. APR 8715.1 Chapter 35, Lead Management Plan

i. ARC 230, Entry Permit for Permit Required Confined Spaces

j. ARC 874, Excavation Permit

k. ARC 887, Lift Determination Form

l. ARC 888, Critical Lift Plan

m. ARC 889, Non-Critical Lift Plan

n. Ames Local Master Specification, Environmental Compliance and Pollution Prevention[1]

o. Ames Site Specific Safety Plan Template[2]

p. ANSI/ASSE A10.3, Safety Requirements for Powder Actuated Tools[3]

q. ANSI/ASSE Z87.1, Occupational and Educational Personal Eye and Face Protection Devices[4]

r. ANSI/ASSE Z89.1, Industrial Head Protection[5]

s. ANSI/ASSE Z89.2, Safety Requirements for Industrial Protective Helmets for Electrical Workers, Class B[6]

t. ANSI/ISEA 107, High Visibility Safety Apparel and Accessories[7]

u. ANSI/ASSE Z359, Fall Protection Code[8]

v. ASHRAE 12-2000, Minimizing the Risk of Legionellosis Associated with Building Water Systems[9]

w. FAA Form 7140.1, Notice of Proposed Outdoor Laser Operations[10]

x. Nuclear Regulatory Commission (NRC) NUREG/BR-0024[11]

y. NRC Form 241, Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters[12]

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[1] Ames Local Master Specification: https://jc.arc.nasa.gov/jceindex.html
[2] Ames SSSP: https://procure.arc.nasa.gov
[3] ANSI/ASSE A10.3: https://www.assp.org/standards
[4] ANSI/ASSE Z87.1: https://www.assp.org/standards
[5] ANSI/ASSE Z89.1: https://www.assp.org/standards
[6] ANSI/ASSE Z89.2: https://www.assp.org/standards
[7] ANSI/ISEA 107: https://www.assp.org/standards
[8] ANSI/ASSP Z359: https://www.assp.org/standards
[9] ASHRAE 12-2000: https://www.ashrae.org/technical-resources/standards-and-guidelines/guidance-on-reducing-the-risk-of-legionella
[10] FAA Form 7140.1: https://www.faa.gov/forms
[11] NRC NUREG/BR-0024: https://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0024/
[12] NRC Form 241: https://www.nrc.gov/reading-rm/doc-collections/forms/nrc241info.html

z. NFPA 10, Standard for Portable Fire Extinguishers[13]

aa. NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work[14]

bb. NFPA 70E, Standard for Electrical Safety in the Workplace[15]

cc. T8 CCR Chapter 4, Division of Industrial Safety[16]

dd. California Manual on Uniform Traffic Control Devices (CAMUTCD)[17]

P.5 MEASUREMENT/VERIFICATION

a. Verification of conformance to requirements in this directive are measured through Center and Responsible Organizational management reviews, self-assessments, and subsequent analysis and reports of conformance to requirements, as well as periodic internal audits.

P.6 CANCELLATION

a. APR 8715.1 Chapter 27, Construction Safety Management, dated June 2, 2015.

EUGENE TU

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Date: 2020.09.15 18:54:32 -07'00'

Eugene Tu
Director

DISTRIBUTION STATEMENT:

Internal and external distribution.

[13] NFPA 10: https://www.nfpa.org/
[14] NFPA 51B: https://www.nfpa.org/
[15] NFPA 70E: https://www.nfpa.org/
[16] T8 CCR Chapter 4: https://www.dir.ca.gov/title8/sub4.html
[17] CAMUTCD: https://dot.ca.gov/programs/traffic-operations/camutcd

CHAPTER 27 CONSTRUCTION SAFETY MANAGEMENT

27.1 Responsibilities

27.1.1 Safety, Health, and Medical Services Division (Code QH) shall:

a. Provide construction safety oversight for construction and/or maintenance projects.

b. Provide Certified Asbestos Consultants (CAC) for assessment and oversight of projects including maintenance activities that pose a potential or actual disturbance of materials that contain asbestos. The CAC determines the presence/absence of asbestos containing materials by:

(1) Reviewing and evaluating asbestos-abatement plans, specifications, and abatement contractor submittals prior to abatement

(2) Verifying that personnel who perform asbestos abatement work on NASA property have appropriate training and credentials to perform their assignments.

(3) Periodically inspecting the abatement area and contractor/subcontractor for compliance with the Ames Asbestos Management Plan.

c. Provide a California Department of Public Health (CDPH) Certified Lead Inspector/Assessor and/or a Project Monitor for assessment and oversight of projects including maintenance activities that pose a potential or actual disturbance of materials containing lead.

d. Provide updates and information on construction safety regulatory changes to ARC, evaluate, and minimize their impact to the Center.

e. Review and evaluation of all building permits prior to the start of construction projects.

f. Review and evaluation of contractor safety plans and all associated documentation prior to the start of construction projects.

g. Support construction related mishap investigations.

h. Accompany all regulatory agency personnel on all visits to construction sites.

i. Maintain a central location for all construction safety management documentation.

j. Provide Construction Safety and Health 30-Hour OSHA training.

27.1.2 NASA Ames Construction Safety Specialist shall:

a. Be the primary health and safety contact for inspection and compliance pertaining to construction and maintenance related work activities.

b. Conduct regular job site inspections for compliance to NASA Ames policies and procedures and regulatory agency laws and guidelines for construction and alterations and/or repairs in relation to maintenance activities.

c. Notify responsible parties of any Health and Safety hazards concerns to initiate remediation on a job site for construction and maintenance alteration and/or repair activities.

d. Provide professional safety technical advice related to construction activity, including:

(1) Review of contractor's safety submittals in accordance with the deliverables section of this document and associated safety documentation submitted to the Contracting Officer

Representative (COR) to ensure compliance with OSHA and Ames Health and Safety Procedural Requirements.

(2) Review construction permits to integrate complete and applicable safety requirements into safety plans, drawings and specifications.

(3) Review project documents during the design phase.

(4) Review Contractor documentation of required health and safety "Weekly Tailgate Meetings".

(5) Attend construction project bid walks and preconstruction meetings to communicate safety expectations and provide guidance to the COR, project managers, and contractor personnel.

(6) Respond to and investigate all reported non-emergency mishaps or close calls.

(7) Verbally notify the Code QH Mishap program manager, COR, and CO when responding to a mishap or close call.

e. Submit an Unsafe Condition Noncompliance Notice to the COR and Contracting Officer when a documented deficiency has not been resolved in a reasonable amount of time.

f. Submit a Stop Work Notice to the COR and Contracting Officer when a deficiency poses an immediately dangerous to life and health.

g. Maintain an electronic copy of all daily construction site inspection and safety submittals for the duration of the project.

h. Review Hot Work Permit issued by the Fire Prevention Officer.

i. Examine the log book maintained by the General Contractor for accuracies such as the date, times that work will be conducted, location, and the signature of the person conducting the hot work.

27.1.3 NASA Ames Health Unit shall:

Upon request, provide emergency medical treatment to construction workers who have experienced on acute injury or illness while working on Ames Research Center.

27.1.4 Acquisition Division (Code JA) shall:

a. Ensure that the Ames Safety, Health, and Medical Service Division (Code QH) has reviewed all construction of facility project designs prior to the bid proposal process.

b. Ensure contractor has submitted a site-specific health and safety plan, provide a copy to the Ames Safety, Health and Medical Service Division for concurrence, and ensure that the plan is reviewed and concurred with prior to issuance of Notice to Proceed.

c. Ensure that all construction contracts contain safety requirements recommended by Code QH.

d. Consult with NASA Ames Construction Safety Program Manager to determine the level of safety professional oversight that would be required for a construction project for the role of the Site Safety Health Officer (SSHO).

e. Ensure suspension of work (FAR 52.242-14) will not be lifted until the deficiencies are corrected with concurrence from the NASA Ames Construction Safety Program Manager.

f. Review past safety performance prior to Contractor selection including incident rates, lost time accidents and Experience Modification Rate (EMR).

g. Notify the Ames Safety, Health and Medical Services Division when the selected contractor has an EMR above 1.25.

27.1.5 NASA Ames COR / Project Manager shall:

a. Ensure that all construction-related work activities are conducted in accordance with NASA policies and all applicable regulations that pertain to construction safety.

b. Receive Construction Safety and Health 30-Hour OSHA training through Code QH.

c. Submit contractor scope of work, safety plans all associated documentation to the Construction Safety Specialist for review 15 calendar days prior to staging the jobsite.

d. Ensure the contractor implements an injury prevention policy and complies with the provisions of the approved construction safety plan and associated documentation in accordance with APR 8715.1.

e. Notify the CO immediately upon notification of an accident or mishap. Create a NMIS report for the mishap.

f. Invite Construction Safety Specialist to participate in bid walks, pre-construction and weekly progress meetings when necessary to discuss construction safety concerns, issues and planning activities.

g. Provide notification to affected building occupants before any construction work begins in occupied buildings.

h. Ensure that only NASA Environmental Division-designated personnel sign hazardous waste manifest(s).

i. Coordinate confined space activities as required in APR 8715.1 Chapter 26, Section 26.1.2.2.

j. Ensure that existing utilities (e.g., electrical, gas, steam) requiring shutoff are identified and a lockout/tagout plan has been established.

k. Ensure the Construction Safety Specialist is provided with the project design plan prior to the approval.

l. Ensure that the "Construction Permit" is not issued until a safety specialist in the appropriate field (e.g., Fire, Safety, and Asbestos) approves the design plan.

m. Ensure legionella control features in water and ventilation systems, as stated in APR 8715.1 Chapter 56. Examples of legionella control features include avoidance of dead legs in water systems, effective water temperature controls and proper placement of building air intakes.

n. Provide ARC 887 to the mobile lift contractor 10 business days prior to the lift so the contractor may determine if the lift is classified as critical or non-critical.

o. Provide ARC 888 or ARC 889 to the mobile lift contractor if the Lifting Devices Equipment Manager determines that the Mobile Lift Contractor will use one of these forms.

27.1.6 Contractors shall:

a. Comply and require all subs to follow the requirements of 29 CFR 1926, this chapter and approved site specific safety plan and all its associated documentation. When projects reside on property that is indicated by Safety, Health, and Medical Services Division (Code QH) as Cal-OSHA jurisdiction, Title 8 and this chapter is to be followed.

b. Exercise supervisory authority for the construction activities on the job-site.

c. Conduct daily job-site safety inspections and document the inspections utilizing the Construction Safety Inspection form (see Appendix E) or equivalent.

d. Ensure that all employees are trained and appropriately certified for the activities they are conducting per their scope of work on the job-site.

e. Ensure that all employees are fully aware and understand the contractor's Hazard Assessment by developing Job Hazard Analysis (JHA) of all hazards associated with the project.

f. Ensure whomever create or notice an unforeseen hazard during its daily inspection immediately addresses the issue.

g. Designate a Site Safety and Health Officer (SSHO) and/or Safety Manager who is in position of authority for safety oversight and capable of identifying existing and predictable hazards in the surrounding jobsite. If the SSHO needs to leave the job-site for a period of time, either the work stops, or another employee needs to be assigned as the alternate SSHO. For qualifications, see Section 27.4.1.

h. Ensure subcontractors comply with the Competent or Qualified person requirements if they were to co-share SSHO duties with their subs. See Section 27.4.1

i. Ensure the SSHO can be identified at all times when work is being conducted. This includes when subcontractors are performing work at the job-site.

j. Notify the COR and Construction Manager immediately upon discovery of any health and safety deficiency that the contractor cannot resolve.

k. Notify the COR and Construction Manager immediately when regulatory agency personnel (e.g., OSHA) commence an inspection.

l. Notify the COR immediately after an accident or mishap.

m. Ensure all safety plans and associated documentation are signed off by the COR before work begins. See the Submittals section of this Chapter for additional information.

n. Ensure that no deviation from the approved safety plan and associated documentation occurs without the written approval from the COR and concurrence from Construction Safety Specialist.

27.1.7 Site Safety and Health Officer (SSHO) shall:

a. Be present and identifiable on the job-site at all times when work is being performed. Work must stop if the SSHO leaves the job-site.

b. Conduct a detailed inspection of the job-site, document the inspection using a checklist, and ensure the inspection document is available at the job-site for review.

c. Ensure that items such as broken equipment, defective tool and any other safety hazard are immediately mitigated.

d. Conduct mishap investigations in accordance with Section 27.2.4.

27.2 Worksite Procedures

27.2.1 Utility Pre-Outage Coordination

27.2.1.1 Contractors shall:

a. Apply for utility outages in writing through the COR and/or Project Manager at least ten (10) working days in advance of the work activity. Include the location of the outage, duration of outage, any necessary sketches, and information that clearly identifies the circuits or system requested to be turned off.

b. Attend a pre-outage coordination meeting with the COR and/or Project Manager that includes the NASA Ames utility representative. The meeting is held after the outage request has been approved in writing and prior to beginning work on the utility system. The purpose of the meeting is to review the scope of work and the lock-out/tag-out procedures for worker protection.

c. Only perform work on de-energized electrical circuits.

27.2.2 Hazard Control

27.2.2.1 The contractor shall ensure:

a. Job-site hazards are adequately controlled to prevent injury and illness. Provide pre-task planning, job-site training, inspections, hazard identification, hazard controls, and management commitment to eliminate hazards, job-site authority to remedy recognized hazards, and adequate records documentation. The Prime Contractor is responsible for ensuring each subcontractor complies with this Chapter.

b. That if any severe hazard exposure or imminent danger is identified, personnel stop work, secure the area, then develop a plan to safely remove the exposure, control the hazard, and perform actions to restore and maintain safe working conditions.

27.2.3 Protection of the Public and Federal Employees from Asbestos and Lead

27.2.3.1 Work will not be performed in any area occupied by the public or federal employees unless specifically permitted by the COR or the CO. Adequate steps must be taken for the protection of the public or federal employees at all times.

27.2.3.2 Notification of Asbestos / Lead:

a. The Safety, Health and Medical Services Division in coordination with the COR will periodically notify the following groups:

(1) Employees of NASA who will work in or adjacent to areas that contain such material.

(2) On multi-employer worksites, all employers/employees who will be performing work within or adjacent areas that contain such materials.

b. Sign Placement:

(1) Signs need to be placed to alert and inform the viewer in sufficient time to take appropriate evasive actions to avoid the potential harm from the hazard.

(2) Safety signs need to be placed that they are legible, non-distracting, and not hazardous in themselves.

27.2.4 Accident Scene and Notification

27.2.4.1 In the event of fires, explosions, chemical spills, illness, injuries, and other emergencies, call 650-604-5555 or 911 from a cell or other external phone and ensure to follow the list below.

a. Be prepared to relay the following information to the dispatcher:

(1) Location of emergency

(2) Nature of the emergency (Fire, medical, chemical, etc.)

(3) Number of persons injured

(4) If known, a brief description of the accident (to include the type equipment involved, if any, PPE used, etc.)

(5) Remain on the line with the dispatcher until he or she releases you.

b. Then notify the Ames Safety, Health and Medical Services Division at 650-604-5602.

c. Preserve the conditions and evidence on the accident site until the Government has conducted its investigation.

d. Do not allow personnel to leave the scene or discuss details before formal interviews have been completed by the Government investigation team.

e. Notify the COR as soon as practical of a Type A and Type B mishap, but no later than one (1) hour after a hospitalization, fatality, $2 million loss or high visibility incident.

f. Notify the COR as soon as practical of a Type D and Type C mishap, but no later than four (4) hours after other accidents meeting the definition of Recordable Injuries or Illnesses: property damage of at least 50,000 or less than $20,000, Close Calls, or any weight handling equipment accident in accordance with NPR 8621.1.

g. Report all incidents via the NASA Mishap Information System (NMIS) at http://q.arc.nasa.gov/IncidentReporting.html within twenty-four (24) hours.

27.3 Forms, Notices, and Permits

27.3.1 Display of Safety Information

a. Within one (1) calendar day after commencement of work, erect a safety bulletin board at the job site.

b. Posted items are required to be durable in order to withstand the outdoor elements such as rain and sun or replaced frequently so they remain legible.

c. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method acceptable to the Contracting Officer that includes all mandatory information for employee and visitor review shall be deemed as meeting the requirement for a bulletin board.

d. Items posted on the bulletin board shall include but not limited to:

(1) Confined space entry permit.

(2) Hot work permit.

(3) Excavation permit.

(4) Federal and California OSHA posters.

(5) Emergency information such as numbers to call for emergency assistance, name and location of designated medical facility.

(6) Contact information of key NASA and Contractor personnel working on the project.

(7) Site specific safety plan, Best Safe Practices, JHA's and associated documentation.

27.3.2 Safety Inspection Form

27.3.2.1 The contractor shall conduct and document a daily safety inspection of the job-site and have it available at the job-site. See Appendix E for an example.

27.3.3 Hot Work Permit

27.3.3.1 The contractor shall obtain and post a written permit at job-site prior to performing "Hot Work" or operating other flame/spark producing devices (e.g., welding, cutting, powder actuated tools, tar pots, etc.) from the NASA Ames Fire Prevention Officer at 650-604-3112 or 650-604-2024. See Section 27.10 for additional Hot Work requirements and Appendix D for an example of a hot work permit form.

27.3.4 Excavation Permit

27.3.4.1 The contractor shall obtain an excavation permit from NASA Ames Engineering Branch (Code JCM) at 650-604-0079 and post the permit at jobsite prior to performing excavation of six (6) inches or deeper. See Section 27.11, Trenching and Excavation, for additional information.

27.4 Personnel and Qualifications

27.4.1 Site Safety and Health Officer (SSHO) shall:

a. Be a Competent or Qualified person (See Appendix A for definitions).

b. Have completed the OSHA 30-hour training course covering 29 CFR 1926, Standards for Construction Industry and be certified by an OSHA Authorized Online-Outreach Training Provider or an OSHA Authorized Construction Trainer.

c. Have a minimum of one year or more of construction safety related experience and be an employee other than the superintendent. The COR or Ames Safety, Health, and Medical Services Division may require additional years of experience due to the project size and scope of work

d. Have knowledge and/or certification (such as Fall Protection Competent Person, Scaffold Competent Person, Confined Space, Forklift, Aerial lift, etc.) that NASA or OSHA requires for specific specialized training if the scope of work demands it. The COR, in consultation with Ames Safety, Health and Medical Service Division, will review and approve credentials for those areas of expertise.

27.4.2 For limited service contracts and/or minor maintenance, alteration, and repair including painting and decorating support service project, the COR and Ames Safety, Health and Medical Services Division may adjust the above qualifications of the SSHO in writing. The minimum adjusted qualifications for the SSHO shall include:

a. Having completed the OSHA 10-hour training course covering 29 CFR 1926, Standards for Construction Industry, and being certified by an OSHA Authorized Outline-Outreach Training Provider or an OSHA Authorized Construction Provider.

b. Having a minimum of one year or more of construction safety related experience and knowledge within their area of expertise.

c. For small and short duration contracts, the CO, COR and the Ames Safety, Health and Medical Services Division may modify SSHO requirements in writing, which includes the delegation of SSHO position.

27.5 Submittals

27.5.1 All safety submittals shall be submitted to the COR for review and concurrence by Ames Safety, Health and Medical Division prior to starting work.

27.5.2 Company Safety and Health Program (Injury and Illness Prevention Program)

27.5.2.1 Provide the prime contractor's company Safety and Health Program or Injury and Illness Prevention Program (IIPP) for review and is on record to ensure compliance is being met. Work cannot proceed without an accepted SSSP and review of contractor's program or IIPP.

27.5.3 Site Specific Safety Plan

27.5.3.1 Submit a written Site-Specific Safety Plan (SSSP) to the COR 15 days prior to the date of the preconstruction meeting for acceptance or by the date specified by the contract. If the prime contractor is writing the SSSP for a subcontractor, the subcontractor shall submit, on company letterhead, their written concurrence to the SSSP with the understanding that they must comply with all controls and personal protective equipment requirements specified by the prime contractor. This documentation shall be kept at the job-site and be made available for review upon request. The Notice to Proceed shall not be granted unless the SSSP has been accepted. Prime contractor shall state in writing all sub-contractor safety submittals have been reviewed and approved by their SSHO prior to submitting to the COR.

27.5.3.2 Required for every contractor and subcontractor working at NASA Ames. Work cannot proceed without an accepted SSSP.

27.5.3.3 The SSSP shall be job specific and include the following requirements, depending on the scope of work and the contractor's approach:

> *Note: See the Ames Site Specific Safety Plan Example – Construction Only at https://procure.arc.nasa.gov for guidance on how to develop a SSSP.*

a. Project Details – Names of prime contractor, project name, contract or task number, accurate project description, location, plan preparer and a signature sheet.

b. Responsibilities and lines of authority – Statement of the employer's implementation of their safety plan, accountability of personnel responsibility for safety at all levels from prime contractor to the subcontractors and include the designation of the SSHO.

c. Scope of work – the type of work you will be performing on the job-site.

d. Any additional site safety requirements that may be provided at the preconstruction meeting by the occupant of the location, the COR, or the Ames Occupational Safety, Health, and Medical Service Division.

e. Training records – List of mandatory training certifications that are applicable to this project (e.g., confined space, fall protection, crane operator, rigger, respiratory protection, etc.) and any requirement for periodic retraining/recertification. (Must be available upon request after initial submittal.)

f. Safety and Health inspections – Provide details on the following (Records available upon request):

(1) Who will conduct safety inspections (ex. Project Manager, SSHO, and/or supervisors).

(2) Frequency of inspections should be daily.

(3) Process to record inspections daily, deficiency tracking system, follow-up procedures daily, etc.

g. List, identify, and describe hazard activities specific to the project and provide JHA as an appendix of the SSSP.

h. A schedule of at least one Safety Toolbox meeting a week that includes topics related to hazards that employees will encounter at the job-site.

i. Emergency response procedures.

j. A spill procedure such as when storing fuels, chemicals, or coatings, etc. which requires mitigation.

27.5.3.4 Continuously review and amend the SSSP or JHA's as necessary throughout the life of the contract and provide copies to the COR and Ames Construction Safety Specialist for review and concurrence.

27.5.3.5 Once work begins, changes to the approved SSSP shall only be made with the knowledge and concurrence of the COR, Project Superintendent, SSHO, and Ames Construction Safety Specialist.

27.5.4 Job Hazard Analysis (JHA)

27.5.4.1 Job Hazard Analysis is a technique to identify the dangers of specific tasks to reduce the risk of injury to workers. The JHA focuses on the relationship between the worker, the task, the tools, and the work environment. After you identify uncontrolled hazards, you will take steps to eliminate or reduce them to an acceptable risk level.

Note: OSHA Guidelines on JHA's: https://www.osha.gov/Publications/osha3071.pdf

27.5.4.2 The Contractor and subcontractors shall submit JHA's to the COR for review 15 days prior to work.

27.5.4.3 JHA's will contain each of the section identified below (see Appendix C for an example of a JHA):

a. Task (Activity) Description: Specific the work to be performed as an example; operating machinery, equipment and powered hand tools.

b. Hazard Description: Using the tasks listed, identify the hazards related to the work being performed as an example; flying debris, dust, wood chips, metal shavings getting into the eyes.

c. Hazard Controls: The preventive measures taken to eliminate or mitigate the hazard to an acceptable operational level for example know and utilize the manufacturer's operating, maintenance, and safety procedures and use personal protective equipment (PPE) as required, as an example; ear protection, goggles, face shield, safety shoes, and work gloves.

27.5.4.4 JHAs shall always be posted on job site bulletin board available to employees for reference during work.

27.5.5 Confined Space Entry Plan

27.5.5.1 The Contractor shall provide their confined space program for review to the COR along with their training documentation 15 business days prior to the start of work in accordance with OSHA standards 29 CFR 1910.146, and 29 CFR 1926 Subpart AA and any other regulatory requirements identified in the contract. The most stringent requirements govern when inconsistencies arise.

27.5.5.2 Required for every contractor and sub-contractor working in confined spaces, a Site-Specific Confined Space Entry Plan shall be submitted to the COR 5 business days prior to start work shall include:

a. Identify permit space(s) and site plan showing the location.

b. Pre-entry hazard assessment.

c. Eliminate or control the hazards and maintain safe entry conditions for the duration of entry.

d. Establish entry procedures and prepare an entry permit

e. Training records for employees performing the entry supervisor, attendant, and entrants on the entry operations and their responsibilities.

f. Emergency Procedures.

g. Other information depending type of work or approach.

27.5.5.3 All confined space permits must be submitted to Building N237, Office 103, the Safety Office, Mail Code 237-14.

27.5.6 Trench and Excavation Plan

27.5.6.1 Contractors are to provide a written Excavation plan that is site specific.

27.5.6.2 A Site-Specific Excavation Plan shall be submitted to the COR 5 business days prior to start work and:

a. Indicate the name of the competent person

b. Indicate if the excavation is made entirely in stable rock or is less than 5 feet (1.52m) in depth and a competent person has examined the ground and found no indication of a potential cave-in.

c. Include the design of the sloping and/or benching in accordance with the tabulated data, such as tables and charts, approved by a registered professional engineer. The tabulated data should include the following:

(1) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data.

(2) Identification of the limits of use of the data, to include the magnitude and configuration of the slopes determined to be safe.

(3) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

d. A plan indicating the sizes, types, and configuration of the materials to be used in the protective system and which identifies the registered professional engineer who approved it.

e. Include scope of work, start and end date, exact location of the excavation, name and contact information of the competent person, excavation details (depth, soil type, adjacent structures such as roadways, etc.), cave-in protection to be provided, access, egress, air sampling, platforms, ramps, information on underground construction other than trenching, means to control water accumulation in the excavation, means to protect pedestrians and vehicular traffic from excavations.

f. Address, if an excavation greater than 20 feet (6.09m) in depth, a support system, shield system, and any other protective systems approved by a registered professional engineer.

27.5.6.3 Also see the Trenching and Excavation section 27.11 of this chapter.

27.5.7 Fall Protection Plan

27.5.7.1 The Fall Protection Plan shall be written, prepared, and modified by a qualified person or competent person (Fall Protection) as per ANSI/ASSE Z359.2 that is site specific and meets the minimum requirements for a comprehensive managed Fall Protection plan. See Appendix F for a Fall Protection Plan template.

27.5.7.2 The Site-Specific Fall Protection Plan shall be submitted to the COR 5 business days prior to start work and :

a. Describe the scope of work.

b. Assess the fall hazards on site.

c. Outline the fall protection methods and equipment being used.

d. Outline the assembly, maintenance, inspection and disassembly procedures for equipment being used.

e. Address the handling, storing, and securing of tools and materials.

f. Address what kind of overhead protection is being used.

g. Outline a rescue plan to retrieve a fallen or suspended worker.

h. Certify employee training and instruction in the fall protection plan.

i. Fall protection training records.

27.5.8 Radioactive Materials Use

27.5.8.1 Submit radioactive material license to the COR and the Radiation Safety Officer (RSO) 650-604-4548 or 650-604-4825 (Ames Safety, Health and Medical Services Division, N237 room 106) for all use of radioactive materials and equipment at ARC. Submit at least five (5) business days prior to bringing radioactive material on site.

27.5.8.2 If the radioactive material license is issued by the state of California or any other state, the license submittal shall be accompanied by an approved NRC Form 241 (it can be download at https://www.nrc.gov/reading-rm/doc-collections/forms/nrc241info.html). Note that the NRC requires a minimum of 3 days to process and approve the NRC Form 241.

27.5.8.3 Provide the RSO with a copy of the firm's radiation safety manual at least five (5) business days prior to bringing radioactive material on site.

27.5.8.4 Submit copies of all required certifications to perform work with radioactive material and ionizing radiation sources (e.g. IRRSP certification for radiographers) at least five (5) business days prior to bringing radioactive material on site.

27.5.8.5 For performing Industrial Radiography, submit a completed "Notification of Radiography" form and "Notice of Radiation Testing" form to the Radiation Safety Officer or the Assistant Radiation Safety Officer at least two (2) working days prior to intended dates of radiography. Contact the Radiation Safety Officer to receive copies of these forms.

27.5.8.6 See section 27.14 in this chapter for specific radiation safety requirements.

27.5.9 Laser Safety Plan

27.5.9.1 Submit safe operating procedures for use of any Class 3B and Class 4 lasers to the COR and Laser Safety Officer 650-604-4548 or 650-604-4825 (Ames Safety, Health and Medical Services Division, N237 room 106). Submit this application at least ten (10) working days prior to intended laser operations for indoor laser use and forty-five (45) days prior to laser operations for outdoor use.

27.5.9.2 For outdoor use of all classes of lasers (Class: 1, 1M, 2, 2M, 3R, 3B, and 4): submit a FAA form 7140-1 "Notice of Proposed Outdoor Laser Operations" (it can be download at https://www.faa.gov/forms/index.cfm/go/document.information/documentID/186172) to the COR, Laser Safety Officer and Airfield Manager. FAA approval can take up to forty-five (45) days

27.5.9.3 See section 27.14 in this chapter for specific laser safety requirements.

27.5.10 Radiofrequency (RF) / Microwave Safety Plan

27.5.10.1 Submit safe operating procedures for use of high-power RF/Microwave transmitting devices (does not include universal low intensity devices such as cell phones, Wi-Fi devices, and walkie-talkies) to the Nonionizing Radiation Safety Officer 650-604-4548 or 650-604-4825 (Ames Safety, Health and Medical Services Division, N237 room 106). Submit these forms at least five (5) working days prior to use.

27.5.10.2 See section 27.14 in this chapter for specific RF/Microwave safety requirements.

27.5.11 Crane Operation

27.5.11.1 Submit crane inspection reports to the COR.

27.5.11.2 Mobile lift contractors shall submit to COR the following documentation at least five (5) business days prior to lift for approval by the Ames Lifting Device Equipment Manager (LDEM):

a. Lift Plan

b. Crane certification

c. Operator and rigger certification

d. Certification of insurance

e. Certification of rigging hardware

f. Hazard Analysis if it's a critical lift

27.5.11.3 Crane operator, riggers, and signal person must meet the criteria of the National Commission for the Certification of Crane Operators (NCCCO) for certification and qualification status as per 29 CFR 1926, Subpart CC. A qualified person shall prepare and sign a written Crane Lift Plan that is site specific.

Use ARC 888, or ARC 889, or equivalent. The COR can provide a copy of the ARC 888 or ARC 889 if requested.

27.6 Construction Site Reference Materials

Maintain project related reference materials and make them available to personnel working at the job-site. Include equipment manufacturer's manuals and safety related information to protect employees.

27.7 Obstructions

27.7.1 Construction activity, and maintenance alteration, repair replacement and at a minimum but not limited to including painting and decorating operations shall not:

a. Obstruct a corridor, aisle, stairway, door, or exit in such a manner as to encroach on routes of ingress or egress utilized by the public or building occupant.

b. Obstruct access to fire protection panels and equipment.

c. Obstruct or close streets, walks, and other facilities occupied and used by the Government without written permission from the COR.

27.8 Temporary Traffic Disruption

27.8.1 Contractor shall submit a Temporary Traffic Control Plan (TTCP) to the COR 72 hours in advance for approval prior to disrupting traffic addressing the following characteristics within the plan:

27.8.2 Construction activity, and maintenance alteration, repair replacement, and at a minimum but limited to including painting and decorating operations that disrupt traffic shall:

(1) Erect and maintain temporary barricades to limit public access to the hazardous area

(2) Access to paved areas such as roads, parking areas or sidewalks are prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic barricades will be required.

(3) Provide sufficient visual warning of the hazard during both day and night, by placing barricades clearly visible with adequate illumining system.

(4) TTC will be conducted in accordance with California Manual on Uniform Traffic Control Devices (CAMUTCD).

(5) TTC plans should be prepared by a knowledgeable person (for example, trained and/or certified) about the fundamental principles of TTC and work activities to be performed.

(6) The TTC design, selection and placement of the TTC devices should be based on engineering judgment. As to the four zones which are the advance warning area, the transition area, the activity area and the termination area. Note: The degree of detail in the TTC plan will depend entirely on the nature and complexity of the situation.

(7) If traffic on the affected road is not visible from one end to the other, then flagging procedures, a pilot car with a flagger used as described in Part 6, Section 6C.13 of the CAMUTCD, or traffic control signals should be used to control opposing traffic flow.

(8) Maintain training documents for personnel actively participating on a TTC on site.

(9) Flaggers shall be trained in safe traffic control practices and public safety contact Technics as outline in Part 6, Section 6E.01 of the CAMUTCD.

27.9 Fences and Barricades

27.9.1 The contractor shall ensure:

a. The outdoor project job-site areas and contractor lay-down areas are enclosed with a 6-foot high chain link fence and gates that is maintained in good condition during the life of the contract and removed upon completion and acceptance of the work.

b. Temporary barricades are utilized whenever safe public access to paved areas such as roads, parking areas, or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of pedestrian or vehicular traffic. Also, they need to be securely placed, clearly visible, and adequately illuminated to provide sufficient visual warning of the hazard during both day and night.

c. Fencing is erected at all open excavations and tunnels to control access by unauthorized people. Fencing must be installed to be able to restrain a force of at least 250 pounds against it.

d. Lights, barriers, signals, signs, passageways, detours, and other human traffic-control items are erected and maintained to protect the public and NASA contractors/employees.

e. Access to fire hydrants and fire department connections is maintained. Contact the COR for permission to erecting fences and barricades near fire hydrants and fire department connections.

27.10 Hot Work

27.10.1 The contractor shall:

a. Obtain a permit written permit from the Ames Fire Prevention Office at 650-604-3112 prior to welding, cutting, or operating an open flame-producing device outside a designated shop and post the permit at the job-site prior to performing any hot work. See Appendix D for a permit example.

b. Ensure a fire watcher is present during the hot work and for additional 30 minutes who:

(1) Meets the requirements provided in 29 CFR 1910.252(a)(2)(iii)(A)(1) through (A)(4). Is equipped with a fire extinguisher and trained to use it following the requirements in 29 CFR 1910.252(a)(2)(iii)(B).

c. Provide forty-eight (48) hour notice to Ames Facilities Maintenance at 650-604-5212 prior to any hot work that may affect the fire access panel or the fire and life safety system within any building.

d. Review the location of the nearest fire alarm boxes and emergency services dispatch phone number which is 650-604-5555 with personnel.

e. Ensure that all fire watchers, welders, and their apprentices are familiar with and trained to the requirements provided in NFPA 51B, 29 CFR 1910.252 and 1910.253.

f. Obtain a new permit if the hot work is modified and/or the location of the hot work requires a change.

g. Direct questions regarding a fire or post emergency response/reporting to the Ames Fire Marshall at 650-604-4302.

h. As per OSHA Letter of Interpretation dated January 11, 1999 by Mr. High: Exemption: If "Reasonable anticipation" that gas will be drawn within 24 hours must be based on whether specific welding or cutting work is planned for that period. An assessment must also be made as to the number of gas cylinders expected to be required to do that work and only that number is out of storage.

27.11 Trenching and Excavation

27.11.1 The contractor shall:

a. Obtain an excavation permit (ARC 874) from Ames Plant Engineering at (650) 604-0079 five (5) business days prior to excavating six (6) inches or deeper.

b. Post the permit at the job-site.

c. Assign a point-of-contact (POC) for work conducted inside a facility prior to starting work.

d. Ensure the POC obtains a copy of the facility emergency evacuation procedures from the facility service manager or COR.

e. Strictly comply with 29 CFR 1926 Subpart P, Sec. 651 and 652, Subpart S, Sec. 800 and Subpart V, Sec. 956.

f. Acquire a professional surveyor to stake out all proposed infrastructure work.

g. Coordinate with the COR and the professional surveyor whenever contract work involves concrete chipping, saw cutting, or core drilling.

Note: Reinforcing steel used in concrete construction makes utility lines extremely difficult to identify.

h. Track utility markings and maintain them for continual visual contact.

i. Hold daily coordination meetings, attended by the COR or NASA Building Inspector, with the excavation personnel to coordinate work activities for the day.

j. Outline the excavation site with white construction paint.

k. Have a Competent Person perform soil classification and provide site control in accordance with 29 CFR 1926, Subpart P, App A – Soil Classification.

l. Have tabulated data, such as tables and charts, approved by a registered professional engineer and available at the job-site specifying the sizes, types, and configuration of the materials to be used in the protective system.

m. Conduct daily inspections of the excavation, adjacent areas, and protective systems by a competent person.

n. Stop work if the competent person identifies a situation that could result in a possible cave-in, failure of protective systems, hazardous atmospheres, or other hazardous conditions.

o. Use Lockout/Tagout procedures to isolate utility systems in circumstances where utilities are unable to be positively identified. De-energize underground high voltage prior to pneumatic or machine power excavation or subsurface demolition activities within the vicinity

Note: The use of historical drawings does not alleviate the contractor from meeting this requirement.

p. Conduct an atmosphere test before employees enter an excavation greater than 4 feet (1.22m) in depth. If any atmosphere deficiencies are identified, refer to section 27.14

27.11.2 Any location methodology that uses radiation such as radiography or density gauges must be done according to section 27.14.1, Radioactive Materials and Radiation Producing Equipment.

27.11.2.1 Hand-dig Requirements shall apply:

a. To excavations within 24 inches in all directions of a marked located utility line.
b. When any adjacent construction work is expected to come within 3 feet of an underground utility system to expose the system at several locations.
c. To dig a pilot trench when called for on the Excavation Permit for all underground utility work along the centerline of new trenches and down to the bottom elevation of the new utility.

Note: Machine excavation may proceed only after it is determined that all existing utilities have been identified and protected.

27.11.2.2 Protection of Personnel during Excavation shall include:

a. Placing a stairway, ladder, ramp or other safe means of egress within a trench excavation that is 4 feet (1.22m) or more in depth so as to require no more than 25 feet (7.62m) of lateral travel for employees
b. Ensuring no employee is permitted underneath loads handled by lifting or digging equipment.
c. Instructing employees to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped to provide adequate protection for the operator during loading and unloading operations.
d. Ensuring the use of a warning system (such as barricades, hand or mechanical signals, or stop logs) when mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation. If possible, the grade should be away from the excavation.
e. Only operating trenching machines with digging chain drives when the spotter/laborers are in plain view of the operator.

27.12 Weather Plan

27.12.1 Severe Storm

In the event of a severe storm, the contractor shall:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
b. Check surrounding area, including roofs, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.
c. Ensure that temporary erosion controls are adequate.
d. Cover piles of soil to prevent runoff when rain storms are forecast.
e. Install stormwater curb guards and drain covers as needed to prevent runoff.

27.12.2 Wind

The contractor shall adhere to the following outdoor work restrictions unless the manufacturer has more stringent requirements:

a. No work on a spiders, or scaffolding, and no lifting of personnel in buckets or crane baskets may occur during steady state winds of 20.7 mph (18 knots) or greater or gusts of 25 mph or greater.
b. Before starting a crane lift, a competent person evaluates and addresses the effects of the ambient wind on the load and on crane stability.
c. During steady state winds of 35 mph (30 knots) or greater, the contractor supervisor immediately:

(1) Conducts a walk of their areas for unsecured items (except for areas already covered in the above section 27.12.1(b)).

(2) Secure at ground level all loose or unanchored items, equipment, supplies and material during steady state winds.

27.13 Confined Space Entry

27.13.1 Contractors entering and working in a permit-required confined space shall:

a. Follow the requirements of OSHA 29 CFR 1926, Subpart AA, 29 CFR 1910, Subpart H, J, Q and R, T8 CCR, Chapter 4, Sec. 5156, and APR 8715.1 Chapter 26 and Chapter 28.

Note. The most stringent requirements govern when inconsistencies arise.

b. Have a qualified safety professional coordinate with the COR to complete a confined space hazard evaluation form that identifies hazardous conditions and entry requirements for all confined spaces for each task requiring a confined space entry permit.

c. Use entry permit (ARC 230 or equivalent). The form is also available at https://procure.arc.nasa.gov/.

d. Have a written permit space program that complies with 29 CFR 1926.1204 implemented at the construction job site and available for inspection prior to and during entry operations.

e. Have all the necessary equipment available to conduct a permit-required entry as specified in 29 CFR 1926.1201(d)(1) through (9) at no cost to the employee and properly maintained.

f. Evaluate the permit-required space atmosphere to determine if acceptable entry conditions exist before changes to the space's natural ventilation are made and before entry is authorized.

g. Constantly monitor the atmosphere for hazardous conditions, at a minimum for air deficiencies and toxic gases and vapors.

h. Share the results of any atmosphere testing with each authorized entrant in accordance with 29 CFR 1926.1204.

i. Assign an attendant outside the permit-required space for the duration of the entry operation.

j. If an attendant is assigned to respond to multiple spaces, indicate policies and procedures within the confined space program as to how the attendant will respond to an emergency affecting one or more of those permit-required spaces without distraction from the attendant's responsibility.

k. Designate each person specifically to supervisor, attendant, and entrant roles as stated in the permit.

l. Develop and implement procedures for summoning rescue emergency services for rescuing entrants from a permit-required space.

m. Notify the NASA Ames Emergency Dispatch prior to entry and after entry has been completed if Ames Fire Department is going to act as the rescue emergency services to assure rescue operations are available by calling 650-604-5416.

n. Ensure procedures include closing off and cancelling the permit when the entry operations have completed.

o. Coordinate with the COR to notify other trades if the workplace contains one or more permit spaces, by posting danger signs or by any other equally effective means.

Note to paragraph 29 CFR §1926.1203(b)(1): A sign reading "DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or using another similar language may satisfy the requirement for a sign.

p. Take effective measures to prevent unauthorized employees from entering a confined space.

q. Coordinate with the COR if there is a need to deviate from the permit.

27.13.2 The contractor may use alternative procedures for entering a permit-required space, provided it meets the specific conditions under 29 CFR 1926.1203(e)(2) and does not need to comply with permit-required space standards 29 CFR 1926.1204 through 1206 and 1926.1208 through 1211 when a competent person determines that all of the applicable requirements are met.

27.13.3 Upon completion, send the completed permit to the Ames Safety, Health and Medical Services Division, ATTN: Administrative Assistant M/S 237-14, Bldg. 237.

27.13.4 Atmosphere Testing Gas Protection

a. Contractors and maintenance personnel working with confined spaces shall:

b. Have one or more employees properly trained and experienced in operation and calibration of gas testing equipment and formally qualified as gas inspectors that are on duty during times workers are in confined spaces with the primary function to test for gas and operate testing equipment.

c. Test for flammable gases, vapors, toxic gases and oxygen deficiencies, then document at least every fifteen (15) minutes or more often when the characteristics of ground or experience indicate gases or vapors may be encountered, unless equipment of constant supervisory type with automatic alarm is employed. Special requirements, coordination, and precautions will apply to areas that contain a hazardous atmosphere or, by virtue of their use or physical character, may be oxygen deficient.

d. Test for flammable and toxic gases and vapors before workers are permitted to enter an excavation after an idle period exceeding thirty (30) minutes.

e. Create a permanent record of readings daily, indicating the concentration of flammable and toxic gases, point of test, and time of test. Submit a copy of the record to the COR at the end of each work day.

f. Follow 29 CFR 1910.146 if maintenance personnel is working is in a confined space.

27.14 Radiation and Laser Safety

27.14.1 The use of radioactive material sources, ionizing radiation producing machines, particle accelerators, lasers, or high-power radiofrequency/Microwave transmitters for construction activities are only permitted to be used on Ames Research Center property with the consent of the NASA Ames Radiation Safety Officer.

27.14.2 The most common construction related activities involving radiation/radioactive material that require authorization include:

a. Industrial Radiography.

b. Soil Compaction testing utilizing a nuclear density gauge.

c. Handheld X-ray fluorescence analyzers using either an x-ray tube or gamma source.

27.14.3 The most common construction related activities involving nonionizing radiation sources that require authorization include:

a. Laser Range Finders.

b. Laser scanners.

c. Microwave and Radio Frequency transmitters and radar (not including universal low intensity items such as cell phones, Wi-Fi devices, and walkie-talkies).

27.14.4 Radioactive Materials and Radiation Producing Equipment

27.14.4.1 The contractor shall:

a. Maintain copies of the documentation listed in the submittals section on the jobsite at all times.

b. Perform all radiation testing in compliance with radiation safety requirements set forth in 10 CFR Part 20 Standards for Protection Against Radiation.

c. Transport radioactive materials in accordance with DOT radioactive material transport regulations listed in 49 CFR 172-173.

d. Lock and secure radioactive materials when not in use.

e. Immediately report to the Radiation Safety Officer and the COR any radiological health hazard, emergency, or loss of ionizing radiation source at the center.

f. Comply with APR 8715.1 Chapter 8 requirements concerning the use of transmitters.

g. Consent to radiation safety audits by the Radiation Safety Officer or designee at any time.

27.14.4.2 The contractor shall perform the following additional requirements when performing industrial radiography:

a. Ensure that "Notice of Radiation Testing" postings are placed at all entrances to all buildings affected by the radiography at least 24 hours prior to the time of radiography.

b. Ensure that Division Managers, Branch Chiefs, CORs, contractors, and other managers of any affected facility are notified at least 24 hours prior to the radiography to assure that any disruptions to their operations are understood. The notification informs them that affected areas will need to be clear of all personnel for the timeframe of the radiography.

c. Ensure that Moffett Field Dispatch is notified of building access restrictions and any blocked roadways that could impact potential emergency service efforts prior to commencing radiography and after access restrictions are lifted following the radiography.

d. Ensure that radiographic operations are only conducted between the hours of 5pm and 5am on normal business workdays. Radiographic operations conducted during daytime hours are only permitted during holidays and weekends.

e. Ensure that radiographic operations do not commence until the Radiation Safety Officer or designee has performed a radiation safety audit to ensure compliance with all requirements set forth in 10 CFR 34.

f. Perform non-destructive testing in accordance with accepted industry standards and Nuclear Regulatory Commission (NRC) NUREG/BR-0024 for radiographies when using NRC licensed radioactive materials unless otherwise approved.

g. Notify the COR upon completion of radiological operations.

h. Ensure all radiological postings and boundaries are removed from the affected buildings.

27.14.5 Laser Safety Requirements for Indoor and Outdoor Use

a. Contact the NASA Ames Nonionizing Radiation Safety Officer for any questions about policies and to obtain the procedure templates and forms required to perform the following activities. The Nonionizing Radiation Safety Officer can be reached at 650-604-3979 and the Assistant Nonionizing Radiation Safety Officer at 650-604-4548.

b. Construction lasers are limited to Class 3R and are not often used at night and would not be expected to create a direct or indirect hazard when operated as intended. Occupational Safety and Health Administration (OSHA) regulations require authorized construction laser operators to carry proof of qualification to operate the laser (29 CFR 1926.54) and contain controls appropriate to use. No additional control measures are required when used as intended.

27.14.6 Radiofrequency and Microwave Use

27.14.6.1 The contractor shall ensure the following requirements are met for Microwave and Radio Frequency transmitters (not including universal low intensity items such as cell phones, Wi-Fi devices, and walkie-talkies):

a. Ensure the use of transmitters receive authorization from the Nonionizing Radiation Safety Committee and Nonionizing Radiation Safety Officer.

b. NASA Ames personnel and on-site hard badged contractors take online RF safety training. For other construction contractors or users, the Nonionizing Radiation Safety Officer will provide a training handout to be read and signed by all workers and then returned to the Nonionizing Radiation Safety Officer prior to use being authorized.

c. Contact the NASA Ames Nonionizing Radiation Safety Officer for any questions about policies and to obtain the procedure template and forms required to perform the above activities. The Nonionizing Radiation Safety Officer can be reached at 650-604-3979 and the Asst. Nonionizing Radiation Safety Officer at 650-604-4548.

27.15 Hazard Communication Program

27.15.1 Contractors and maintenance personnel involved in a project working with hazardous materials shall:

a. Describe on the SSSP the approach to providing training to workers (including subcontractors) regarding the details of the hazard communication program.

b. Follow the requirements covered in 29 CFR 1910.1200 and at a minimum but not limited to:

(1) Provide the location of SDS and inventory of hazardous materials.

(2) Ensure workers are trained on the hazard communication program, labeling the hazardous materials and location of SDS's on the job-site

(3) Ensure all hazardous materials containers are labeled properly

c. Receive approval from the COR or their designated representative prior to bringing any hazardous material onto the job-site. Allow a minimum of 10 working days for processing of the approval.

d. Follow APR 8500.1 and APR 8553.1.

e. Follow the Ames Local Master Specification - Environmental Compliance and Pollution Prevention https://jc.arc.nasa.gov/jceindex.html sections for storage, handling or disposal of hazardous materials or hazardous waste.

27.16 Electrical

27.16.1 Contractor and maintenance personnel involved in electrical work on a project shall:

a. Perform work in accordance with the current edition of the National Electric Code (NEC), National Fire Protection Association (NFPA), OSHA, and contract referenced documents.

b. Certify that any underground electrical vault is safe for entry before entering to conduct work.

c. Where the ground will be mechanically penetrated or excavated more than six inches in depth, a subsurface utility scan is performed prior to start on the excavation.

d. De-energize and ground all underground cables to be cut and positively identify cables to be cut using an impulse cable phasing utility device.

e. Provide a written program as part of the SSSP when performing work on or near Electric Power Generation, Transmission, and distribution equipment (such as Substation, the Emergency Power Plant, and overhead and underground 15 kilovolt (kV) power distribution systems).

f. Perform all high voltage cable cutting remotely using hydraulic/piercing cutting tool.

g. When racking in or live switching circuit breakers, ensure no additional person other than the switch operator is allowed in the space during the actual operation.

h. Coordinate with the COR prior to making connection(s) into any part of ARC electrical power distribution system.

i. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers will be permitted to enter.

j. At a minimum, select the personal protective equipment based on the requirements of NFPA 70E, Art 130, Table 130.7(C)(15)(a) – Risk Category and Table 130.7(c)(16) – PPE Category.

k. Require insulating blankets, hearing protection and switching suits depending on the specific job and the Contractor's JHA.

l. Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protect from damage.

m. Immediately remove from service all damaged extension cords.

n. Ensure that portable extension cords meet the requirements of NFPA 70, Article 400, Table 400-4 and OSHA 29 CFR 1926.405(a)(2)(ii)(J).

o. Provide Ground-Fault Circuit Interrupter (GFCI) for all 120-volts, single phase 15- and 20-ampere outlets which are not part of the permanent wiring of the building or structure and are in use by the employees as per 29 CFR 1926.404(b)(1)(ii) and NFPA 70E, Article 100, part 110.6 (B) and (C).

p. Follow the requirements of APR 8715.1 Chapter 11. The most stringent requirements govern when inconsistencies arise.

q. Comply with the Worksite Procedures (Pre-outage Coordination section) of this chapter.

27.16.2 Contractors performing electrical work in walls, ceilings and floors shall:

a. Perform a subsurface site survey for penetrations of greater than 2 inches.

b. Ensure enough clearance is provided to prevent the unexpected contact with any utilities when penetrating any subsurface.

c. Scan for utilities that may be affected by drilling, cutting, etc.

d. Ensure an employee is trained as per manufacturer to use the scanning equipment to conduct the survey.

e. Clearly mark surfaces with the survey findings and provide a survey report to the COR.

f. Implement appropriate controls to ensure the work is done safely when utilities are present.

27.16.3 Any location methodology using radiation such as radiography or the use of density gauges must be done according to section 27.14.1 in this chapter.

27.16.4 Arc Flash Warning and Labels

a. Provide warning labels per NEC section 110.16 and 29 CFR 1910.335(b)(1), for electrical equipment installed.

b. Post label conspicuously on or near the equipment that states "WARNING -- Arc Flash and Shock Hazard -- Appropriate PPE Required."

c. Post label to provide additional information described in NFPA 70E indicating: flash hazard boundary, calories per square centimeter, personal protective equipment level, kilovolt shock hazard when cover is removed, limited approach distance, restricted approach distance and prohibited approach distance.

27.17 Scaffolding

27.17.1 Contractors working with scaffolding shall:

a. Ensure each scaffold and scaffold component, erectors, dismantlers and end users comply with 29 CFR 1926.451, 1926.452, 1926.454 and 1926 Subpart L – Appendix A Scaffold Specs.

b. Ensure each scaffold is designed to support, without failure, its own weight and at least 4 times the maximum load meeting the requirements of 29 CFR 1926 Subpart L – Appendix A.

c. Ensure each end user receives training or re-training by a qualified person in the subject matter to recognize the hazards associated with the type of scaffold and to understand the procedures to control or minimize those hazards meeting the requirements in 29 CFR 1926.454. The training shall include the following areas, as applicable:

d. Electrical hazards, fall hazards and falling objects in the work area
e. The proper use of the scaffold, and the proper handling of materials on the scaffold
f. The maximum intended load and the load-carrying of the scaffolds used; and any other pertinent requirements
g. Ensure that required fall protection is used and the fall protection plan is followed.
h. Provide safe access when the scaffold platforms are more than 2 feet (0.6 cm) above or below in accordance with 29 CFR 1926.451(e)(1).
i. Access scaffold platforms greater than twenty (20) feet maximum in height by means of a scaffold stair system with an adequate gate.
j. Ensure that daily documented inspections are performed by a competent person.
k. Protect employees from falling objects when work above is being performed.
l. Not use side brackets on self-supported scaffold systems to extend scaffold platforms to store material.
m. Ensure that supported scaffolds are set on base plates, mud sills, or other adequate firm foundation.
n. Ensure scaffold assembly and disassembly are under the supervision and direction of a competent person qualified in scaffold as per 29 CFR 1926.451(f)(7).

27.18 Lifting Devices and Material Handling Equipment

27.18.1 Contractors shall:

a. Notify the COR or Project Manager fifteen (15) business days in advance of any cranes entering the center so that notifications can be made to the LDEM.

b. Submit lift plan 5 days prior to scheduled lift for coordination and authorization to the LDEM at 650-604-2568, Building N237, room 110.

c. Notify the LDEM of all planned meetings.

d. Comply with Ames Health and Safety Procedural Requirement in APR 8715.1, Chapter 17.

e. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

27.19 Pressure Systems

27.19.1 Follow the requirements of APR 8715.1 Chapter 10. The most stringent requirements govern when inconsistencies arise.

27.20 Asbestos and Lead

27.20.1 Contractors involved in an asbestos or lead related work shall comply with the requirements of APR 8715.1 Chapter 30 and Chapter 35.

27.20.2 Contractors shall notify the COR immediately upon discovery of any previously unidentified PACM, Lead, or undetermined hazardous material.

27.21 Silica Requirements

27.21.1 Contractors shall follow 29 CFR 1926.1153. Table 1 of OSHA standard 29 CFR 1926.1153(c)(1) lists what operations and conditions warrant respirator use or properly implement engineering controls and work practices if used correctly can avoid having to use respirators.

27.22 Fall Protection Plan

27.22.1 Contractors shall follow 29 CFR 1910 Subpart D and I, 1926 Subpart M, and current ANSI/ASSP Z359 whichever is more stringent.

27.22.2 Contractors shall:

a. Establish a site-specific Fall Protection Plan when workers are working at an unprotected side or edge which is greater than 6 feet above a lower level or from an aerial lift or other elevated working surface.

b. Maintain training records containing the name of the employee trained, date of the training, and the signature of the person who conducted the training and make the records available upon request.

c. Ensure re-training is provided if the fall protection system changes or if an employee's actions demonstrate a lack of understanding of the fall protection plan.

d. Consider the hierarchy of fall protection as indicated below:

(1) Hazard elimination – Whenever possible, attempt to change the nature of the task so that it is not necessary to use fall protection.

(2) Passive fall protection – Such as physical barriers between the worker and the fall hazard when established prevents the worker from falling (i.e. guardrails, vertical netting, covers, etc.)

(3) Fall restraint system – The system which could be permanent or temporary which will prevent a worker from reaching the fall hazard zone.

(4) Fall arrest system – The system which could be permanent or temporary that allows a worker to fall but arrests the fall safety before the worker strikes the ground.

(5) Administrative controls – The work practice or procedure designed to warn a person they are approaching a fall hazard. Administrative controls may include warning lines with visible flags, flashing lights, or other methods.

27.22.3 Guardrail System (Passive Fall Protection) should be considered when the working height is 6 feet or more above the walking working surface; this also includes the edge of excavations greater than six feet in depth. Guardrail system shall meet the following criteria:

a. Top rail – 42 inches, +/- 3 inches above the walking/working level

b. Mid-rail – Located midway between the top rail and the walking/working level

c. Toeboard – For elevated walking/working platforms where employees working below are exposed to falling objects. Toeboard must be four inches in height and must be securely fastened.

d. The system used should be smooth to prevent punctures, lacerations or snagging of clothing.

e. The ends of the top rail shouldn't overhang the terminal posts, except when such overhang does not present a projection hazard.

f. When a hoisting area is needed, a chain, gate or removable guardrail section must be placed across the access opening when hoisting operations are not taking place.

Note: It is important to remember that the working level is that level where the work is being done. Someone working on a stepladder next to an edge may raise his/her working surface well above the walking surface.

27.22.4 Skylights

27.22.4.1 Contractors shall consider a skylight as an opening when present on a roof.

27.22.4.2 A standard guardrail or skylight screen capable of supporting at least 200 pounds shall be provided around the opening to prevent workers from falling through to the surface below.

27.22.5 Personal Fall Protection Systems

Contractors using personal fall protection equipment shall:

a. Implement the "Buddy System" or have an observer to render assistance when and if required.

b. Ensure all personal fall arrest system components meet the requirements of the ANSI/ASSP Z359 standards.

c. Ensure all fall restraint system components meet the requirements of the ANSI/ASSP Z359 standards.

d. Use and inspect fall protection equipment in accordance with manufacturer's instructions, but at a minimum prior to use by the authorized user and at least annually by the competent person.

e. Remove equipment from service on the jobsite if it is found to be stressed, worn, rigid or missing a piece.

f. Use the appropriate fall protection equipment when selecting equipment as a fall arrest system or fall restraint system. Only locking snap hooks may be used and body belts are prohibited on the job-site.

Note: A site specific fall protection plan will become a part of the contractor's overall SSSP, which addresses the contractor's approach to implementing the requirement of this chapter. The fall protection work plan is a written plan prepared by a competent person, developed specifically for the job-site where work at heights is performed, may be used by the contractor.

27.23 Use of Explosives (Powder-Actuated Tools)

27.23.1 Explosives shall not be used or brought to the job-site, except as provided in this section.

27.23.1.1 Contractors and maintenance personnel involved in a project requiring the use of a powder-actuated tool shall:

a. Be thoroughly trained in the particular tool used before entering the job-site and exercise extreme care at all times.

b. Possess a certificate of training issued by Hilti or other authorized manufacturer of the tool being used and be able to produce the certificate upon request. Submit a copy of the certificate to the Ames Construction Safety Specialist prior to work.

c. Obtain a Hot Work permit prior to using powder-actuated tools. See the Hot Work section of this chapter for additional information.

d. Use powder-actuated tools in accordance to the manufacturer's specifications and safety precautions and with Federal and State OSHA regulations.

e. Wear appropriate PPE such as safety glasses or goggles, safety shoes, and hearing protection.

f. Provide notice to all occupants before the tool is fired in laboratory or office areas. Persons in adjacent work places may be startled or even injure themselves when unexpectedly exposed to the noise generated by a powder-actuated tool.

g. Test the tool each day before loading to verify safety devices are in proper working condition in accordance with the manufacturer's recommended procedure. Immediately remove from service and tag any tool found not in proper working order, or that develops a defect during use, until it is properly repaired.

h. Load the tool just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at an employee. Keep hands clear of the open barrel end.

i. Secure loaded tools when left unattended.

j. Use the correct shield, guard, or attachment recommended by the manufacturer.

k. Ensure that powder-actuated tools meet all requirements of ANSI/ASSE A10.3 for powder-actuated fastening systems.

l. Obtain the Safety Data Sheet (SDS) for the cartridges and keep with the equipment on site.

m. Only bring cartridges for one (1) day of work onto Ames property. Remove unused cartridges from Ames property at the end of each day.

27.24 Personnel Protective Equipment (PPE)

27.24.1 Personal Protective Equipment (PPE) used on the job-site shall be inspected prior to use to ensure it is in good shape.

27.24.2 The minimum proper PPE on the job-site that is not otherwise covered in another section of this chapter shall:

a. Be long pants and shirts with sleeves.

b. Not be loose fitting clothing or jewelry that may get caught in tools or machinery.

c. Be shoes that protect the feet such as steel or composite toed boots.

d. Be a minimum of ANSI/ASSE Z87 safety glasses with side shields.

e. Be a face shield and safety glasses that works with a hard hat when grinding or other operations that require face protection.

f. Be goggles that are worn when greater eye protection is needed.

g. Be the correct lens for the welding job.

h. Be ear plugs or ear muffs at a minimum but limit to when grinding, using impact hammers or other equipment that create high noise levels (above 85 dB).

i. Be hard hats that comply with ANSI/ASSE Z89.1.

j. Be hard hats that comply with ANSI/ASSE Z89.2 when workers that may be exposed to high voltage or can be burned. See section 27.16 for additional requirements for working with electrical.

k. Be the correct welding helmets that protect the head and eyes from injury.

l. Be reflective apparel such as jackets, shirts, or vests shall that comply with ANSI/ISEA 107, Class 2 requirements.

m. Not be nylon vests when performing hot work such as welding, gas or plasma cutting.

n. Be heavy boots, chainsaw face guard, leather gloves and protective leg chaps when using chain saws.

o. Be the correct tree climbing equipment when workers are climbing trees.

p. Be the appropriate leather gloves while welding, handling building materials and moving equipment to prevent cuts, abrasions and burns.

q. Be the correct gloves (such as nitrile gloves) when handling chemicals.

APPENDIX A. DEFINITIONS

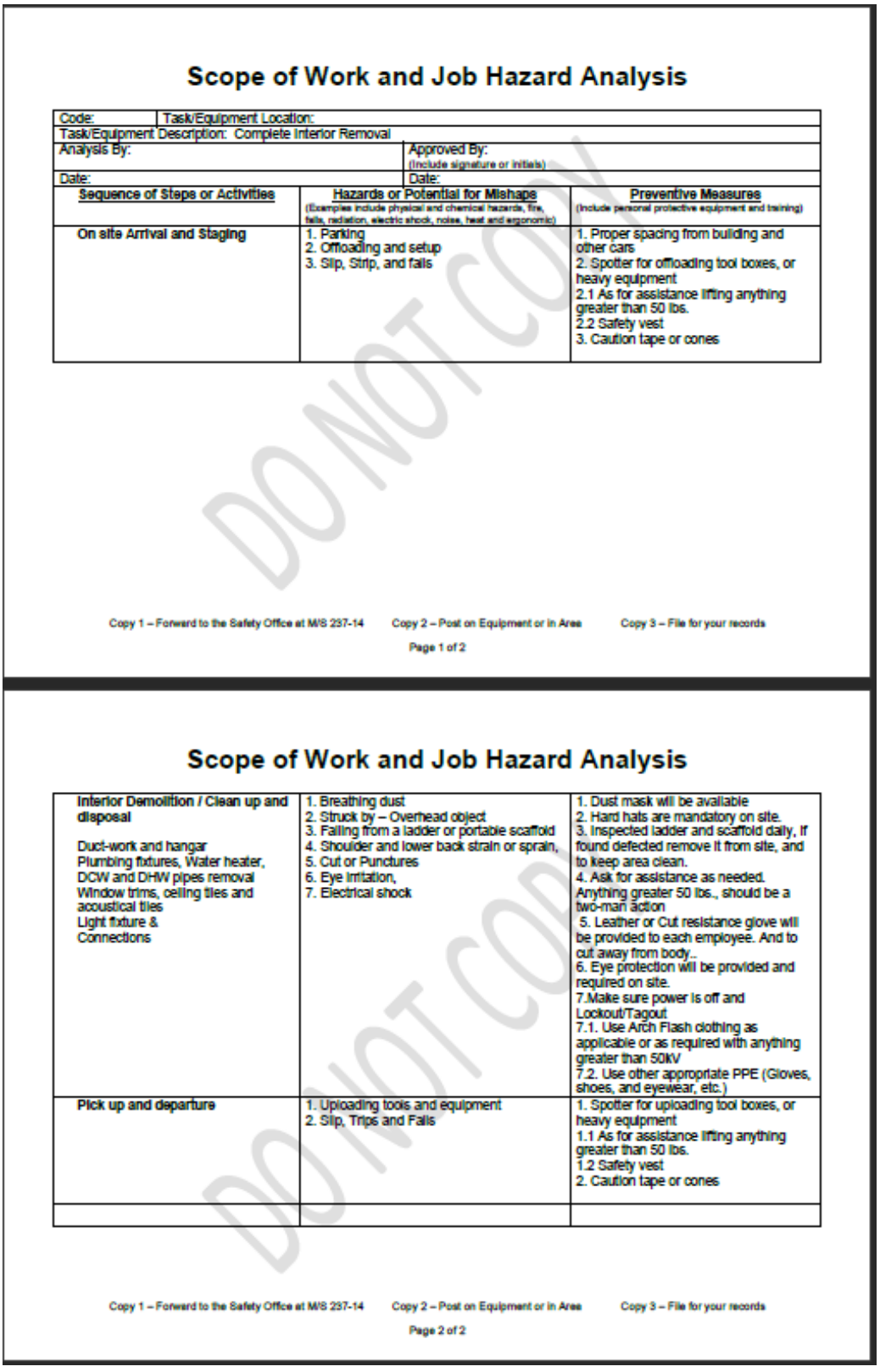
Competent Person	One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. [29 CFR 1926.32(f)]
Competent Person for Fall Protection	Employee trained and certified in fall protection and who can identify hazards, has the authority to take corrective actions, is knowledgeable of applicable regulations, standards, equipment, and systems, and understands the mandatory requirements for fall protection equipment and systems.
Competent Person for Scaffold	Employee trained and certified in scaffolding and who can identify hazards, has the authority to take corrective actions, is knowledgeable of applicable regulations, standards, equipment, and systems, and understands the mandatory requirements for scaffolding.
Construction Contractor (Contractor)	A business entity (i.e., person, corporation, partnership, joint venture, etc.) which has satisfied the contracting officer that they qualify as one of the following: They own, operate, or maintain a place of business regularly engaged in the construction, alteration, or repair of buildings, structures, communication facilities, or other engineering projects, including furnishing and installing of the necessary equipment; or If currently entering into a construction activity, they have made all necessary prior arrangements for personnel, construction equipment, and required licenses to perform construction work.
Construction Work	Construction work, as defined by OSHA 29 CFR 1910.12(b) is any construction, alteration, and/or repair, including painting and decorating of a structure. In order for work to be construction work, the employer need not itself be a construction company. Further, construction work is not limited to new construction; it may include the repair of existing facilities. The replacement of structures and their components is also considered construction work (See OSHA Standard Interpretation 2003-11-18 - Construction vs. Maintenance).
Construction, Alteration and Repair Work	Construction, alteration or repair means all types of work done by laborers and mechanics employed by the construction contractor or construction subcontractor on a particular building or work at the site thereof, including without limitation.
Contracting Officer (CO)	A person who, by appointment in accordance with procedures prescribed by the Federal Acquisition Regulations and NASA FAR Supplement, is currently a warranted Contracting Officer with the authority to enter into contracts, administer contracts, and make determinations and findings with respect thereto or with any part of such authority.

Contracting Officer's Representative (COR)	A person exercising authority and responsibility that has been specifically delegated by the CO. This individual represents the CO in the daily surveillance of the contractor and provides overall technical management of the contract. The COR's authority is limited to those items that have been specifically delegated by the CO.
Experience Modification Rate (EMR)	Factors based on claims paid for Workers Compensation Insurance for the state.
Job Hazard Analysis (JHA)	Defines the activities being performed and identifies the work sequences, the specific anticipated hazards, site conditions, equipment, materials and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.
Maintenance	Keeping equipment or a structure in proper condition through routine, scheduled or anticipated measures without having to significantly alter the structure or equipment in the process as defined by OSHA. For equipment, this generally means keeping the equipment working properly by taking steps to prevent its failure or degradation.
Qualified Person	One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
Qualified Person for Fall Protection	A person in possession of a recognized engineering degree and a formal training certificate from an industry recognized trainer, training center, or an equivalent OSHA training program, who has successfully demonstrated their extensive knowledge and experience to perform structural engineering for design, evaluation, and approval of fall protection systems.
Site Safety and Health Officer (SSHO)	A Qualified and Competent person to monitor safety on the jobsite as per the requirements stipulated by this chapter and is appointed by the contractor.
Subcontractor	A person who agrees to perform any part of the labor or material requirements of a contract for construction, alteration or repair.
Unsafe Condition	A hazardous condition that poses or has the potential to pose a risk to the health and safety of personnel or the public, and/or damaging to equipment, machinery, or the environment.

APPENDIX B. ACRONYMS

ANSI	American National Standards Institute
ARC	Ames Research Center
CAC	Certified Asbestos Consultant
CAMUTCD	California Manual on Uniform Traffic Control Devices
CO	Contracting Officer
COR	Contracting Officer's Representative
EMR	Experience Modification Rate
IIPP	Injury and Illness Prevention Program
JHA	Job Hazard Analysis
LDEM	Lifting Device Equipment Manager
NCCCO	National Commission for the Certification of Crane Operators
NEC	National Electric Code
NFPA	National Fire Protection Association
NMIS	NASA Mishap Information System
OSHA	Occupational Safety and Health Administration
PACM	Potential Asbestos Containing Material
PPE	Personal Protective Equipment
RF	Radiofrequency
SDS	Safety Data Sheet
SSHO	Site Safety and Health Officer
SSSP	Site Specific Safety Plan
TTC	Temporary Traffic Control

APPENDIX C. JOB HAZARD ANALYSIS (JHA) WORKSHEET EXAMPLE



Scope of Work and Job Hazard Analysis

Code:	Task/Equipment Location:	
Task/Equipment Description: Complete Interior Removal		
Analysis By:	Approved By: (Include signature or initials)	
Date:	Date:	
Sequence of Steps or Activities	**Hazards or Potential for Mishaps** (Examples include physical and chemical hazards, fire, falls, radiation, electric shock, noise, heat and ergonomic)	**Preventive Measures** (Include personal protective equipment and training)
On site Arrival and Staging	1. Parking 2. Offloading and setup 3. Slip, Strip, and falls	1. Proper spacing from building and other cars 2. Spotter for offloading tool boxes, or heavy equipment 2.1 As for assistance lifting anything greater than 50 lbs. 2.2 Safety vest 3. Caution tape or cones

Copy 1 – Forward to the Safety Office at M/S 237-14 Copy 2 – Post on Equipment or in Area Copy 3 – File for your records

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Scope of Work and Job Hazard Analysis

Interior Demolition / Clean up and disposal Duct-work and hangar Plumbing fixtures, Water heater, DCW and DHW pipes removal Window trims, ceiling tiles and acoustical tiles Light fixture & Connections	1. Breathing dust 2. Struck by – Overhead object 3. Falling from a ladder or portable scaffold 4. Shoulder and lower back strain or sprain, 5. Cut or Punctures 6. Eye irritation, 7. Electrical shock	1. Dust mask will be available 2. Hard hats are mandatory on site. 3. Inspected ladder and scaffold daily, if found defected remove it from site, and to keep area clean. 4. Ask for assistance as needed. Anything greater 50 lbs., should be a two-man action 5. Leather or Cut resistance glove will be provided to each employee. And to cut away from body.. 6. Eye protection will be provided and required on site. 7.Make sure power is off and Lockout/Tagout 7.1. Use Arch Flash clothing as applicable or as required with anything greater than 50kV 7.2. Use other appropriate PPE (Gloves, shoes, and eyewear, etc.)
Pick up and departure	1. Uploading tools and equipment 2. Slip, Trips and Falls	1. Spotter for uploading tool boxes, or heavy equipment 1.1 As for assistance lifting anything greater than 50 lbs. 1.2 Safety vest 2. Caution tape or cones

Copy 1 – Forward to the Safety Office at M/S 237-14 Copy 2 – Post on Equipment or in Area Copy 3 – File for your records

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APPENDIX D. HOT WORK PERMIT

NASA AMES FIRE PREVENTION
HOT WORK PERMIT

THIS HOT WORK PERMIT IS REQUIRED FOR ANY TEMPORARY OPERATIONS OR TASKS INVOLVING OPEN FLAMES AND/OR SPARKS SUCH AS BRAZING, CUTTING, GRINDING, FLAME SOLDERING, PIPE THAWING AND TORCH-APPLIED ROOFING AND SEAM WELDING. IT ALSO APPLIES TO THE USE OF ORDINARY ELECTRICAL EQUIPMENT IN A HAZARDOUS (CLASSIFIED) LOCATION.

REPORT ALL FIRES! FROM LANDLINE, 9-1-1; CELL (650) 604-5555

Permit #_____	Issued:____/____/____	Expires:____/____/____

REQUESTOR INFORMATION

NASA ☐ Contractor ☐ Name:_____

Code/Company:_____

Cell Phone #:_____

Building/Location:_____ Rm #:_____

Type of Hot Work (Check all that apply):

☐ ARC/Gas Welding ☐ Soldering/Brazing ☐ Cutting Torch ☐ Grinding

☐ Torch-on Roofing ☐ Seam Welding (no open-flame) ☐ Other (specify): _____

For Fire Prevention Office Use Only

I verify the hot work location has been inspected, operator qualifications verified, and precautions listed have been followed. The operation described above is hereby authorized.

PRINT NAME:_____

SIGNATURE:_____

INSTRUCTIONS TO HOT WORK SUPERVISOR

ALL HOT WORK OPERATIONS SHALL BE IN COMPLIANCE WITH CURRENT CALIFORNIA FIRE CODE CHAPTER 35, NFPA 51B, AND OSHA STD 1910 Subpart Q.

1. **Verify** precautions listed on the **BACK** of form (or do not proceed with work).
2. **Post** approved permit (Yellow copy) at job site during the hot work operations.
3. **Return** completed hot work permit (Yellow copy) to the Fire Prevention Office (Bldg 158, Rm. 202) when project is finished.
4. **FOR EXTENSIONS: Call 650-604-2024/3112**

FIRE WATCH SIGNOFF: Work area and all adjacent areas where sparks or heat might have spread were inspected during the fire watch period and were found fire safe.

PRINT NAME:_____ INITIALS:_____

FINAL CHECKUP (HOT WORK SUPERVISOR) – Minimum 30 minutes after Hot Work.
Work area was monitored for specified period of time following hot work and found fire safe.

PRINT NAME: _____

SIGNATURE: _____

HWP Form Rev 3, Dec 2013 **White Copy:** FPO Files **Yellow Copy:** Posted at Site

APPENDIX E. CONSTRUCTION SAFETY INSPECTION CHECKLIST

QH Construction Safety Inspection Checklist

Inspector Name (print):					Contractor & Contact Person:				
Building/Location & Project:						Date:			
Item	Yes	No	N/A	Fixed Date	Item	Yes	No	N/A	Fixed Date
Program Administration					**Fall Protection**				
OSHA Postings / Safety Signs / JHA posted					PFAS are being utilized and in good working condition				
Emergency numbers/contacts posted					Floor openings, shafts & stairs are protected by means of a cover, guardrail or equivalent on all sides				
Passage, entry & walkways clear					Roof or another surface without a parapet or railing of at least 39" are protected				
Daily/Weekly safety meetings held					Hole or trench protected by means of a guardrail, fence, barricade or cover				
Adequate lighting					**Ladders**				
Hand washing/toilet facilities					Side rails extend 36" above the landing				
Fire Prevention					The correct ladder type and size are being used				
Fire extinguishers provided and accessible					Ladders are properly placed and secured				
Extinguisher inspections are performed monthly					Ladders are in good condition				
No-smoking signs posted					**Excavations/Shoring**				
Flammable liquids properly stored					Excavation barricaded / permit issued				
Gas/Compress cyl. secure, upright and properly separated					Access/egress provided				
Electrical					Holes, trenches, & cuts > than 5' deep shored & sloped, or trench boxes are used				
GFCI in use on all power source cords and tools					Shoring and sheathing is correct for soil and depth				
Extension cords and tool cords free from visible damage					Spoil setback is at least 2 feet				
All cords have a properly grounded plug (all 3 prongs)					Daily inspection and work operation supervised by a competent person				
Lockout procedures and devices being utilized					Equipment is away from the edge				
Access to breaker box clear					**Welding & Cutting**				
Hand and Power Tools					Hot work is being carried out				
Hand & power tools in good visual working order					A "Hot Work Permit" is issued and posted in areas requiring a permit				
Tool guards are in place and used correctly					The area is inspected for fire hazards				
Tools are protected from unauthorized use					There is at least a 2A:10B:C (5 lb.) fire extinguisher on hand				
Heavy Equipment					Electrical equipment is grounded and cables are in good condition				
Daily log book filled out					There is adequate ventilation				
Brakes, lights, signals & alarms operable					Screens & shields are in place				
Wheels are chocked when necessary					There is a fire watch for welding or cutting				
Seat belts are worn					**Personal Protective Equipment**				
Material handler lifting area protected					PPE is commensurate with the hazard				
Boom or basket swing radius level and protected					Hardhats/vests are worn				
Rigging equipment inspected, tag-readable					Gloves are available & used				
Barricades & Fencing (Traffic Control)					Foot protection utilized				
Roadways & sidewalks properly marked					Eye protection utilized				
Advanced warning signs posted					Ear protection utilized				
Traffic cones placed for taper and along work area					**Scaffold**				
Termination area established					The scaffold is regularly inspected				
If needed, a flagger with equipment positioned properly					Adequate sills and base plates are being used				
Material Storage/Handling					Toe boards, debris net or another means is installed to protect from falling objects				
Materials properly stored/stacked					There is a safe access ladder, or equivalent to the scaffold				
The pathway is clear to move material					The scaffold is properly planked				
Comments:									

APPENDIX F. FALL PROTECTION WORK PLAN

NASA AMES FALL PROTECTION WORK PLAN

Organization/Company Name:	Date:
Task Location:	
Task Description:	
Types of Fall Hazards	
Unguarded Sides/Edges: ☐ Unguarded Floor Opening: ☐ Unguarded Wall Opening: ☐ Skylight Opening: ☐	
Ladders (Fixed, ≥20 ft.): ☐ Ladders (Portable): ☐ Scaffolding: ☐ Roof Edge: ☐ Equipment/Process: ☐	
Aerial Lifts: ☐ Trenches: ☐ Walking/Working Surface Opening: ☐ Ramps, Runways, Platforms Opening: ☐	
Other(s):	
Methods of Protection (In order of Fall Protection Hierarchy)	
Guardrail System: ☐ Anchorage: ☐ Anchorage Connector: ☐ Full-Body Harness: ☐ Carabiner: ☐ Lifeline: ☐	
Shock Absorbing Lanyard: ☐ Self-Retracting Lanyard (SRL): ☐ Restraint Line: ☐ Rope Grab: ☐	
Warning Line: ☐ Safety Monitor: ☐ Other(s):	
Selection of Anchorage Points	
Anchorage Point 1:	Describe:
Anchorage Point 2:	Describe:
Evaluated by: Competent Person (Non-Certified): ☐ Qualified Person (Certified or Non-Certified): ☐	
Certified Anchorage *– An anchorage for fall arrest, positioning, restraint, or rescue systems that a qualified person certifies to be capable of supporting the potential fall forces that could be encountered during a fall.* ***Non-Certified Anchorage*** *– A fall arrest anchorage that a competent person can judge to be capable of supporting predetermined anchorage forces. These typically consist of unquestionably strong elements of a structure.*	
Steps for Setup, Use, and Egress of System	
1.	6.
2.	7.
3.	8.
4.	9.

5.	10.
Limitations on Use of System	
Maximum free fall permitted:	Maximum number of persons who may attach:
Maximum arrest force:	Clearance distance required below user:
Other(s):	
Equipment Inspection Requirements	
Fall-protection system components have been inspected for wear and proper function prior to use: ☐	
Equipment inspection and certification dates verified current: ☐ Equipment verified ANSI Z359 compliant: ☐	
Rescue Plan	
In case of emergency call Moffett Dispatch @ 911	
Additional Emergency Contact Info:	Phone Location:
Rescue Equipment or Special Rescue Methods:	
Additional Safety Requirements	
Safe Plan of Action (SPA): ☐ or Job Hazard Analysis (JHA): ☐ Head Protection: ☐ Eye Protection: ☐	
Foot Protection: ☐ Hand Protection: ☐ Barricades: ☐ Signage: ☐ Radios: ☐ Other(s):	

Authorized Users (print)	Signature	Date	Training Date
Qualified or Competent Person (print)	**Signature**	**Date**	**Training Date**

ATTACH PHOTO OF WORK AREA BELOW