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CONTRACTOR'S OPERATIONS AND REQUIREMENTS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

This Section covers general requirements applicable to specific Contractor's operations and equipment.

1.2 REFERENCES

The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements
EP 310-1-6A	(2006; 2019 Change 2) Project Operation -- Sign Standards Manual, VOL 1

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO LRFD	(8th Edition; 2017) Bridge Design Specifications

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00, SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Notification Of Equipment Outage

Utility Connection Request

Access Agreements and Work Areas; G

Temporary Electrical Wiring Plan; G

Contractor's Planned Equipment Methods; G

1.4 INCLEMENT WEATHER CONSTRUCTION

Protect work areas from inclement weather, wind damage, and precipitation so that no delay in the prosecution of critical work items, or damage to Government property occurs. No time extensions will be authorized for materials, work in place, or equipment damaged due to negligence during periods of inclement weather.

1.5 PRE-CONSTRUCTION CONFERENCE

A Pre-Construction Conference will be held once Contract award is made. The Pre-Construction Conference will be scheduled by the Government. Key Contractor staff will be required to attend in person. Key personnel include, but are not limited to, Project Manager, Site Superintendent, Project Engineer, Quality Control Manager, and Site Safety Health Officer. The purpose of the Pre-Construction Conference is to establish a mutual understanding of the respective organizations and to establish a team based understanding of the quality and safety expectations for the job. The Government will develop the agenda.

1.6 UNIT OUTAGE WINDOWS

a. All work which requires a fish pump outage must be completed during the windows defined herein. The Contractor may perform onsite preparatory work prior to the window start, but may not impact the function of the equipment. The fish pump rehabilitation must be complete and the fish pump must be available for unrestricted use by the end of the unit outage window. Testing, Balancing and Commissioning must be completed within the unit outage window.

b. Unit 2 Outage Window is November 1, 2026 to November 30, 2027.

c. Unit 1 Outage Window is December 1, 2027 to November 30, 2028. Note this unit is optional. Exercise of this option will be by Contract Modification in accordance with FAR 52.217-7.

d. The Unit Outage Windows for Units 1 and 2 may be reversed to change the order of work if the Option for Unit 1 is exercised within 120 days of award. Notification of the new order of Unit Outage Windows would be provided within the first 120 days after award.

e. The Unit 3 outage window will be December 1, 2028 to January 15, 2030. Note this unit is optional. Exercise of this option will be by Contract Modification in accordance with FAR 52.217-7.

1.7 NOTIFICATION OF EQUIPMENT OUTAGE

Where an equipment outage is required to accomplish the work outlined in this Contract, notify the Government 14 days in advance. This will allow the Government to de-energize the equipment and de-water the work area for Contractor access. This requirement applies to the Fish Pumps within the scope of this Contract.

1.8 UTILITY OUTAGE REQUEST AND UTILITY CONNECTION REQUEST

a. Perform a utility locate prior to the start of excavation. Notify the CO at least two business days prior to starting excavation work. Verify and mark all utilities not shown.

b. Verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated or specified to be removed but indicated in locations to be traversed by piping, ducts, and other work to be conducted or installed.

c. Schedule work to hold outages to a minimum.

d. Arrange utility outages and connections required during the prosecution of work that affect existing systems, at the convenience of the Government, and outside of regular working hours or on weekends. Contractor will not be entitled to additional payment for utility outages and connections required to be performed outside the regular work hours.

e. Requests for utility outages and connections must be made in writing to the CO at least 14 calendar days in advance of the time required. Each request must include the system involved, location involved, utilities being affected, approximate duration of outage, and the nature of work involved.

1.9 WEEKLY COORDINATION MEETINGS

Conduct weekly coordination meetings with the Government. This meeting will be used to discuss Contractor's safety, Quality Control Program, joint risk management, submittals, deficiencies, Contract administration, schedule, actual progress in the last week, and work planned in the upcoming two weeks. Any work requiring Project support or potential impacts to Project operations or maintenance must be noted. The Contractor must provide a two week look ahead, with the previous week progress, 48 hours before each weekly meeting to the Government representative. The Contractor must prepare and distribute, by e-mail, the coordination meeting agenda with a two week look ahead no later than 24 hours before each meeting. A meeting time and place will be mutually agreed upon for the same time each week. Distribute weekly coordination meeting minutes no later than the close of business the next business day.

1.10 CONTRACTOR EMPLOYEES

All employees must be capable of demonstrating adequate knowledge of tools, supplies, equipment, and techniques necessary to competently perform the work. All personnel must be fully qualified in their respective fields to render the services necessary. The Government may require the Contractor to discontinue using any employee in the performance of the work specified in this Contract if the Government determines the performance to be unsatisfactory. Contractor employees will not be permitted to bring guests, family members, or non-employees to the job site at any time.

1.11 PAGERS

All Contractor employees who perform work on-site at John Day Dam must wear a pager that is fully compatible with the Project's message/transmitting and programming system (Apollopagers Gold AL-A25 ALPHA NUMERIC PAGER Frequency 173.4875 mhz). This is a mandatory safety requirement that allows emergency notification of all persons within the Powerhouse and other work areas. No Contractor employee will be allowed to work on-Project without wearing a pager unless specifically so permitted by the CO. In the event of fire or other danger, the Control Room will notify all personnel by pager. Provide one pager for each employee, one week prior to working inside Powerhouse. The Project will program all pagers before site work begins. At the end of the onsite work, the pagers will become the property of the Government. If the pager receivers are lost, not operable, or substantially damaged through use, the Contractor must, at the Government's discretion, repair or replace the units at the Contractor's cost.

1.12 ACCESS AGREEMENTS AND WORK AREAS

1.12.1 Access Agreements

a. Submit access procedures to and from the work site after the Contractor, the CO, and the Project's Representative have coordinated and determined the most advantageous access to, and staging of, the Contractor's assets deployed to the work site. Permissible areas for the Contractor to place the Contractor Office Trailer, Laydown and Parking have been marked on a site map, as well as a parking location for 1 - 2 vehicles near the job site. The Contractor will adhere to these general locations when proposing staging, storage, parking, and trailer locations.

b. The right-of-way for the work (or delivery site) and access thereto will be furnished as stated in this Paragraph subject to mutual agreement between the Contractor and the Government concerning the specific route the Contractor is to use. Such mutual agreement must be reached prior to initiation, construction, or delivery.

c. The existing access roadway and any associated access roads on the Project, must not be closed as a result of construction or delivery activities associated with this Contract unless previously coordinated and approved by the Government. Traffic delays will only be permitted in accordance with the provisions of this Section.

d. When necessary to operate on or to cross existing highways or roads, all necessary permits must be obtained from the appropriate private or public authority.

e. In accordance with FAR 52.236-13 Alt I, ACCIDENT PREVENTION - ALTERNATE I, and EM 385-1-1, flaggers, signs, lights, and/or other safeguards must be provided to safely control and direct the flow of traffic when necessary for equipment to operate on or to cross access roads, arterial roads, or highways.

f. Spillage on Project roads and state or county roads will not be permitted, and the spillage must be immediately cleaned up at the expense of the Contractor.

g. No cleated or crawler-type equipment can be operated on paved surfaces.

h. Damage to all roads caused by the Contractor's operations must be repaired to pre-existing conditions at the expense of the Contractor.

i. Photograph the existing condition of all staging areas prior to mobilization and submit all photographs in the Access Agreements submittal. Failure to properly document existing conditions will result in a Government determination of necessary repairs.

1.12.2 Work Areas

a. Drawings showing the layout of the area proposed for use must be submitted for review and approval and comply with FAR 52.236-10 OPERATIONS AND STORAGE AREAS. The drawing(s) must show the location of the principal components: offices, access roads, parking, storage facilities and disposal areas, which the Contractor proposes to construct within the designated limits.

b. Only Contractor and subcontractor parts trailers and lunch trailers may be allowed in the Contractor work areas and these must be subject to CO and Project approval. All Contractor and subcontractor trailers are required to be adequately and physically anchored to prevent overturning due to high winds. Electrical supply for Contractor trailers is 480V, 30Amp, 3 Phase, ungrounded delta. Contractor must provide transformer. No water supply is available at the trailer area.

c. Should additional working space or lands within the Government right-of-way be required for material yards, job offices, or other purposes obtain prior Government approval in writing. When directed at any time during the progress of the work when space is needed within the right-of-way for other purposes, any part of the grounds that have been in use must be promptly vacated and cleaned up. However, it is not the intent to require the Contractor's plant or material to be removed from an area while such plant, material, or area is still being actively used.

d. The Project staff will brief the Contractor on security procedures. Any such procedures will not be the basis for claims for additional money or time. The Project areas off limits to Contractor personnel will also be designated.

1.12.3 Employee Access and Parking

Contractor's employee private vehicle parking areas must be restricted to the area as agreed upon before construction or delivery. All Contractor vehicles used for prosecuting the work must have a Contractor sign or other permanent identification and must carry the required insurance. Private vehicles not owned by the Contractor must not be used for prosecuting the work. Private vehicles of the Contractor and its employees must enter and leave the project as directed. Keep the parking areas free of litter and debris. An adequate number and size of trash receptacles must be placed in the parking areas and emptied, as necessary to avoid overflowing. Trash receptacles must be adequately secured to provide protection from the wind and animals.

1.13 CONSTRUCTION PROJECT IDENTIFICATION SIGN

Fabricate and install one construction project identification sign in accordance with EP 310-1-6A, Attachment A2, within three days of beginning site work.

1.14 UTILITIES

Provide utilities required for the performance of work under this Contract, except Government-furnished electrical power, and water as described below.

1.14.1 Sanitary Facilities

Use of the Project restroom by Contractor personnel will not be permitted. Provide portable, temporary sanitary facilities in accordance with EM 385-1-1.

1.14.2 Electrical Power

1.14.2.1 General

Use of existing 120V and 480V electrical receptacles is allowed. Take special care not to overload receptacle circuits. Contractor must be responsible for all accessories, such as extension cords, adapters, and raceways for road crossings. Extension cords must not be allowed to cross crane rails.

1.14.2.2 Temporary Electrical Wiring

Submit a Temporary Electrical Wiring Plan for temporary electrical wiring. Install all temporary electrical wiring in accordance with EM 385-1-1 and as approved. All temporary electrical wiring must be removed prior to completion of the Contract. Include load calculations to ensure conduit capacity is not exceeded.

1.14.3 Water

Reasonable amounts of water for domestic use will be made available from existing outlets and supplies. No charge will be made for the water.

1.15 CONTRACTOR'S EQUIPMENT

1.15.1 Contractor's Planned Equipment Methods

Submit proposed methods of transportation and operation of cranes and other heavy equipment for approval prior to commencement of those operations. Submittals must include the type, size, loadings of equipment, placement of outriggers, and the proposed transportation routes and work areas to be used on the project. Operation of heavy equipment adjacent to existing structures must be avoided when possible. Testing requirements and operation of cranes and other heavy equipment must be in accordance with EM 385-1-1. All cranes, rigging, lifts, operators, vehicles, and other necessary means to move equipment or items must be Contractor-furnished as required to pursue and complete the work and must comply with EM 385-1-1.

1.15.2 Plant and Equipment List

Within seven days prior to commencing site operations, provide a complete list of all plant and equipment to be used on the job site, exclusive of shop equipment. Throughout the life of the Contract, submit an up-to-date plant and equipment list with each progress payment request. Include rented equipment as well as lease purchase or sale leaseback equipment on the lists. Initial list and the revised monthly lists must indicate dates equipment is assigned to or removed from the project; deadline dates for repairs and returned for use; dates of the most recent and planned inspections; and adequate identification or description of each item of equipment including manufacturer's name (abbreviated), model number, manufacturer's serial number, year of manufacture, and Contractor's assigned serial or record number.

1.15.3 Movement of Equipment by the Contractor

a. Unless otherwise noted, any vehicle crossing a project bridge is limited to AASHTO LRFD, HL-93 vehicle and load requirements. Submit a loading diagram for approval showing wheel loads, wheel spacing, and

travel speed a minimum of 30 days prior to operating any equipment or vehicles whose loading conditions are in excess of a HL-93 vehicle. Prior coordination and approval for such loads must be obtained before proceeding. No exclusion trucks, multi-axle specialized hauling vehicles (SHV) or mobile cranes will be allowed on a bridge deck without prior review and approval. At a minimum, the loading diagram must include but not be limited to the following information:

(1) A typical section and plan view of the bridge, the position of the wheel loads and wheel spacing of the truck or crane.

(2) The GVW of the vehicle and all axle weights.

(3) For cranes, the location and weight of axles before and after counter weights are installed, all outrigger loads, required crane boom length, weight and location of center of gravity. This should also include the effects of guy lines, upper spreader and jib mast. If using a jib, show the length, weight, and location of the center of gravity.

b. Any SHV's authorized to drive on the bridge deck must have all lift axles lowered and fully engaged while the vehicle has any load. For cranes, all specialized boom trailers must be engaged until a final set up with the outriggers are made and approved.

1.16 CONTRACTOR USE OF GOVERNMENT CRANES

Powerhouse bridge crane will be made available by request and operated by the Government. The Government will also provide a rigger and signal person for the duration of the lift. Contractor must provide planned lifting requirements in weekly coordination meeting. Request for crane assistance must be finalized no less than one week in advance for non emergency lifts. All requests must be scheduled during regular project work hours. Provide 30 days notice to Government of planned use of the Powerhouse bridge crane for fish pump Unit 1 only, to permit Government to address special access considerations applicable only to Unit 1.

1.17 CONTRACTOR SUPPLIED EQUIPMENT AND HOIST OPERATIONS

a. Hoist Replacement

Replace the Existing Hoist at Elevation 168.5. Remove the existing hoist and turn over to the Government as salvage. Retain the existing jib structure. The hoist must be replaced as one of the first site activities so it can be used to lower equipment and tools to the fish pump room. The existing hoist does not have sufficient reach to be used for this purpose. Perform any functional or load testing as required by the manufacturer.

b. Hoist Features

The hoist must

(1) have a capacity of Two Ton (2,000 kg),

(2) operate on 120V and have cord long enough to reach existing outlet at all positions on the beam,

(3) include pendant control,

(4) include wire rope of sufficient length to reach the fish pump room floor (Elevation 131.67), and

(5) fit the existing jib structure. Hoist must be compatible with existing jib structure. Submit product data for Government Approval.

c. Contractor Use of Government Hoist

The Contractor may use the New Hoist to facilitate access to the Fish Pump Room. Submit personnel certification and designations in accordance with EM 385-1-1 requirements. The Government will remove the deck hatches and install handrail. Use this hoist to the maximum extent possible to minimize use of the bridge crane. Calculate the weight of all loads estimated to be in excess of 2,000 lbs to ensure the hoist and jib are not overloaded.

1.18 DAMAGED EQUIPMENT OR ABNORMAL CONDITIONS

Inform the CO immediately upon finding any damaged equipment or other abnormal conditions involving additional work in which the Contractor believes it has no responsibility. The failure or abnormality must not be disturbed until witnessed by the CO. Prior to proceeding further with work, the Contractor and the Government must agree in writing as to the responsibility for the damage or abnormality. Any damage or abnormal conditions not reported as specified above must also be corrected.

1.19 USE OF EXPLOSIVES

Use of explosives will not be permitted.

1.20 DAILY CLEANUP AND DISPOSAL

Keep all work areas reasonably neat on a daily basis. Collect, remove, and dispose of all debris resulting from the work, such as waste metalwork, packing cases, scrap lumber, and other debris off-site at least once per week. Do not use the Government's trash cans, dump boxes, and other containers. Do not dispose of liquid waste in Project drains. All costs of removing debris must be incidental to the work and therefore no separate payment will be made.

1.21 DISPOSAL OF EQUIPMENT AND MISCELLANEOUS MATERIALS

Title to all materials and equipment to be disposed of, excepting materials salvaged for the Government, will be vested in the Contractor when beginning disassembly work or when such materials and equipment are designated as scrap. The Government will not be responsible for the condition, loss, or damage to such property after title transfer. The Contractor may retain these items in usable form and take possession of them providing that there is no subsequent cost or inconvenience to the Government. The Government does not guarantee that these items are complete or in working order and the Contractor must assume responsibility for any damages caused by their use immediately upon taking possession of them.

1.22 SALVAGE

Some items will remain the property of the Government during the Contract

and after completion. Salvage must include removal of the material, equipment, etc., from its present location and transporting, bundling, protecting, cleaning, and storing it on-site as directed. Salvage items will be those specified. Maintain property control records for material or equipment designated as salvage. Contractor's system of property control may be used if approved by the CO. Contractor must be responsible for the storage and protection of all salvaged materials and equipment and must replace all salvage materials and equipment which are stolen, broken, or damaged during the salvage operations as the result of the Contractor's negligence or while in the Contractor's care. The following items must be salvaged: Removed gearbox.

1.23 PROTECTION OF MATERIAL AND WORK

All materials, supplies, tools, equipment and Government property (including all tools, equipment, and special devices supplied by the Contractor and to be turned over to the Government at the end of the Contract) must at all times be protected and preserved in an approved manner. If material, equipment, supplies, and work performed are not adequately protected, such property may be protected by the Government and the cost thereof will be charged to the Contractor or deducted from any payment due.

1.24 PROTECTION OF EXISTING UTILITIES

Protect existing utilities in accordance with FAR 52.236-9, PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Repairs must be made immediately and at Contractor's expense.

1.25 PROTECTION AND RESTORATION OF EXISTING FACILITIES

Protect all existing facilities whether or not shown on the drawings or referenced in the specifications. Leave all the existing facilities, not included as a portion of the work, in a condition equal to the original condition prior to the Contract upon completion of work. Costs for repair and restoration of any facilities must be considered to be incidental to the work and included in the Contract price.

1.26 RESTORATION OF PROJECT ROADS

Project roads used for construction access will be evaluated and must be restored to their original condition by the Contractor as required. Repair and restoration must be made at the expense of the Contractor.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

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GOVERNMENTAL SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this Specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ANSI/ASSP A10.34	(2021) Protection of the Public on or Adjacent to Construction Sites
ANSI/ASSP Z490.1	(2016) Criteria for Accepted Practices in Safety, Health, and Environmental Training
ASSP A10.28	(2018) Safety Requirements for Work Platforms Suspended from Cranes or Derricks - American National Standard for Construction and Demolition Operations
ANSI/ASSP Z359.1	(2024) The Fall Protection Code

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B30-PKG	Load Handling Equipment

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2022; ERTA 1 2021) Standard for Portable Fire Extinguishers
NFPA 241	(2022; ERTA 22-1) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 51B	(2024) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2023; ERTA 1 2024; TIA 24-1; TIA 25-2) National Electrical Code
NFPA 70E	(2024) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements
ER 385-1-100	(2014) Safety and Occupational Health: Arc Flash Hazard Program

ER 385-1-31	(2009) Safety and Occupational Health: The Control of Hazardous Energy

U.S. ARMY CORPS OF ENGINEERS - PORTLAND DISTRICT (NWP)

CENWP-OD-SAF-385-1	(2019) CENWP-OD Standing Safety Procedure 385-1, SAFETY, Portland District Supplement (Fixed Plant) to USACE, Hazardous Energy Control Program

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.94	Ventilation
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1926	Safety and Health Regulations for Construction
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146
CPL 02-00-147	The Control of Hazardous Energy - Enforcement Policy and Inspection Procedures

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Crane Operators; G

Training Plan; G

Hazardous Energy Control Plan and HEC Procedures Training Certification; G

Accident Prevention Plan (APP); G

Fall Prevention and Protection Plan; G

Fatigue Management Plan (FMP); G

Activity Hazard Analysis (AHA); G

Inclement Weather and Heat/Cold Stress Management Plans; G

Scaffolding; G

Arc Flash Hazard (AFH) Program; G

SD-06 Test Reports

Regulatory Citations, Violations, and Corrective Action

Drug and Alcohol Use Prevention Program

Accident or Mishap Reports

Crane Testing Reports

SD-07 Certificates

Arc Flash Hazard (AFH) Training Certificate

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

1.3 DEFINITIONS

1.3.1 High Visibility Mishap

Any mishap which may generate publicity and/or high visibility. Report the following high visibility mishaps immediately:

a. Uncontrolled release of hazardous energy, including Arc Flash, Electrical, and other energy sources (such as pressurized gas, fluids, etc.)

b. Load Handling Equipment and Rigging

c. Fall-from-Height

d. Underwater diving

1.3.2 Medical Treatment

Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered personnel.

1.3.3 Recordable Injuries or Illnesses

Any work-related injury or illness that results in:

a. Death, regardless of the time between the injury and death, or the length of the illness

b. Days away from work (any time lost after day of injury/illness onset)

c. Restricted work or transfer to another job

d. Medical treatment beyond first aid

e. Loss of consciousness

f. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (e) above.

1.3.4 Government Property

Interpret "USACE" property and equipment specified in EM 385-1-1 as Government property and equipment.

1.4 REGULATORY REQUIREMENTS

a. In addition to the detailed requirements included in the provisions of this Contract, comply with the edition of EM 385-1-1 in effect on the date of the Solicitation for this Contract, and applicable Federal, State, and local laws, ordinances, criteria, rules and regulations. Submit regulatory citations, violations, and corrective action and matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements apply.

b. Contact the Contracting Officer (CO) immediately of any OSHA or other regulatory agency inspection or visit, and provide the CO with a copy of each citation, report, and Contractor response. Correct violations and citations promptly and provide written corrective action plan to the CO.

1.5 DRUG AND ALCOHOL USE PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, Prime and subcontractor, on the site, to include administrative action for employees failing the program. Ensure that no employee uses illegal drugs, in accordance with Federal law, or consumes alcohol during work hours. Ensure no employees are under the influence of drugs or alcohol during work hours. Ensure all employees are fit for duty. During the Contract period, submit a copy of tests, including results of random testing, to the CO. Only submit numbers of individuals tested and results of tests, not personal data.

1.6 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

a. Provide a Safety oversight team that includes a minimum of one Competent Person to function as the SSHO. The SSHO must meet the requirements of EM 385-1-1, Section 2-3.b, and ensure that the requirements of 29 CFR 1926 are met for the project. The SSHO must be at the work site at all times to implement and administer the Contractor's safety program and Government-accepted Accident Prevention Plan. The SSHO's training, experience, and qualifications are as required by EM 385-1-1.

b. Provide a Competent Person for all of the hazards identified in the Contractor's Safety and Health Program in accordance with the accepted Accident Prevention Plan. The Competent Person must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) for acceptance by the CO in consultation with the Safety Office.

c. The SSHO must have no duties other than SSHO. The SSHO must meet the following requirements:

(1) A minimum of five years of continuous construction industry safety experience in supervising/managing general construction (managing safety programs or processes or conducting hazard analyses and developing controls) on similar projects.

(2) 30-hour OSHA Construction safety class or equivalent within the last four years.

(3) SSHOs must maintain competency through having taken eight hours of documented formal, on-line, or self-study safety and health related coursework every year.

(4) Competent Person training as needed.

1.6.1.2 Alternate SSHO and Designated Representative (DR)

a. The Alternate SSHO must meet the same requirements and assume the responsibilities of the project SSHO. Assistant SSHO's may be necessary during the main shift along with the lead SSHO, but are primarily intended to be on-site during the times that the lead SSHO is absent from the work site. The assistant SSHO may have other duties on the jobsite.

b. If the SSHO is off-site for a period longer than 24 hours, provide an alternate to fulfill the same roles and responsibilities as the primary SSHO.

c. When the SSHO is temporarily (up to 24 hours) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at all times when work is being performed.

Note: DRs are collateral duty safety personnel, with safety duties in addition to their full-time occupation.

d. If an activity, or task contains multiple sites and has been assessed and given an activity Risk Assessment Code (RAC) of low or medium, a DR must be appointed for each site where remote work locations are more than 45 minutes travel time from the SSHO's duty location.

(1) DRs must perform safety program tasks as designated by the SSHO and report safety findings to the SSHO.

(2) A DR may not be assigned to projects that have a RAC level of high or extremely high.

1.6.1.3 Crane Operators

Meet the crane operator's training and medical requirements in EM 385-1-1 Chapter 16; ASME B30-PKG; 29 CFR 1910; and 29 CFR 1926. Submit documentation for all crane operators including certification, qualifications, and designation in writing.

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If the Superintendent, QC Manager, or SSHO are dismissed project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out. The SSHO must:

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Daily Contractor Quality Control Report.

b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Contractor Quality Control Report for Prime and subcontractors.

c. Maintain applicable safety reference material on the job site.

d. Attend the Preconstruction Conference, pre-work meetings including the Contractor Quality Control Preparatory Phase inspection meeting, Initial Phase inspection meetings, Follow-up Phase, additional Preparatory and Initial Phase meetings, and periodic in-progress meetings.

e. Implement and enforce accepted APPs and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. Post a list of unresolved safety and health deficiencies on the Safety and Health Bulletin Board.

g. Ensure subcontractor compliance with safety and health requirements.

h. Maintain a list of hazardous chemicals on site and their safety data sheets (SDS).

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

a. The purpose of the Preconstruction Conference is for the Contractor and the CO to become acquainted and explain the functions and operating procedures of their respective organizations.

b. Contractor representatives required to attend this Preconstruction Conference include anyone who has a responsibility or significant role in accident prevention on the project. This includes the project superintendent, SSHO, quality control supervisor, or any other

assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

c. Discuss the details of the submitted APP to include incorporated plans, programs, procedures, and a listing of anticipated AHAs that will be developed and implemented during the performance of the Contract. This list of proposed AHAs will be reviewed at the Conference and an agreement will be reached between the Contractor and the CO as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.

d. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the Preconstruction Conference. Revise the plan to correct deficiencies and re-submit it for acceptance. Work will not begin until there is an accepted APP.

1.6.3.2 Safety Meetings

Conduct weekly safety meetings at the project site for all employees as required by EM 385-1-1. Inform and invite the CO to the meeting in advance. Attach minutes showing Contract title, signatures of attendees, and a list of topics discussed to the Daily Contractor Quality Control Report.

1.6.3.3 Work Phase Meetings

Discuss appropriate AHAs during Contractor's Quality Control (CQC) work phase meetings as required in Section 01 45 00.00 25 QUALITY CONTROL.

1.7 TRAINING

1.7.1 New Employee Indoctrination

Inform new employees (Prime and subcontractor) of specific site hazards before they begin work. Keep documentation of this orientation on file at the project site.

1.7.2 Periodic Training

Provide Safety and Health Training in accordance with EM 385-1-1 and the accepted APP. Ensure all required training has been accomplished for onsite employees.

1.7.3 Training Plan

Prior to beginning a new phase, provide training to all affected employees to include a review of the AHA to be implemented. Contractors can choose to utilize Job Hazard Analyses (JHA) in lieu of AHAs as long as the JHA meets the requirements of an AHA to include a Risk Assessment.

1.7.4 Hazardous Energy Control Plan and HEC Procedures Training Certification

a. Provide annual Hazardous Energy Control Plan and Procedure Affected Person (AP) training to all Contractor and subcontractor personnel working under, or in the vicinity of, clearances as defined in CENWP-OD-SAF-385-1 (Attachment A6).

b. All costs for this training must be considered incidental to the work, and therefore, no additional payment will be made. Cost for the training is approximately $55 per individual. Training is provided by Vivid Learning Systems and is available on line a thttps://hsi.com/partners/usace-training

c. Submit the training completion certification a minimum of seven days prior to the individuals arrival at site. Maintain training documentation on site, including the individual's name and date of training completion, in accordance with CENWP-OD-SAF-385-1.

1.7.5 Fall Protection Training Program

Institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, provide training for each employee who might be exposed to fall hazards, see Paragraph FALL HAZARD PROTECTION AND PREVENTION PROGRAM. Provide training by a Competent Person for fall protection in accordance with EM 385-1-1. Document and retain training evaluations for fall protection and rescue for the current training program per ANSI/ASSP Z359.1.

1.7.6 Arc Flash Hazard (AFH) Training Certificate

All Contractor personnel working in or around equipment with a potential for an Arc Flash Hazard must have completed Arc Flash Hazard Training as defined in ER 385-1-100. Maintain training certification on site, including the individual's name and date of training, instructor's name, and outline of training content. Show certification of training annually for qualified individuals. Show certification for unqualified personnel within three years.

1.8 ACCIDENT PREVENTION PLAN (APP)

1.8.1 General Information

a. Use a Qualified Person to prepare the written site-specific APP. See EM 385-1-1 for definition of Qualified Person. Prepare the APP in accordance with the format and requirements of EM 385-1-1 and as supplemented herein. Cover all Paragraph and Subparagraph elements in EM 385-1-1, Section 2-7.b. Specific requirements for some of the APP elements are described below:

(1) The APP is job-specific and address any unusual or unique aspects of the project or activity for which it is written.

(2) Interface the Contractor's overall safety and health program with the APP. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and made site-specific.

(3) The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors.

(4) Inform subcontractors of the safety provisions under the terms of the Contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting

subcontractor operations to ensure that accident prevention responsibilities are being carried out.

(5) Sign the APP by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, and the designated SSHO.

b. Submit the APP to the CO 15 calendar days after Notice to Proceed for acceptance. Work cannot proceed without an accepted APP. The CO will review and comment on the Contractor's submitted APP and accept it when it meets the requirements of the Contract provisions.

c. Once accepted by the CO, the APP and appendices will be enforced as part of the Contract. Disregarding the provisions of this Contract or the accepted APP will be cause for stoppage of work, at the discretion of the CO, until the matter has been rectified.

d. Once work begins, changes to the accepted APP must be made with the knowledge and concurrence of the CO, project superintendent, SSHO, and quality control manager. Should any severe hazard exposure (i.e. imminent danger), become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the CO, both verbally and in writing, within 24 hours of discovery. In the interim take all necessary actions to restore and maintain safe working conditions in order to safeguard on-site personnel, visitors, the public (as defined by ANSI/ASSP A10.34), and the environment.

e. Maintained copies of the APP at the CO's office and at the work site. Continuously review and amend the APP, as necessary, throughout the life of the Contract. Incorporate unusual or high-hazard activities not identified in the original APP in the plan as they are discovered.

1.8.2 EM 385-1-1 Contents

In addition to the requirements above and those outlined in Section 2-7.b of EM 385-1-1, the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other Competent and Qualified personnel to be used. Specify the duties of each position.

b. Qualifications of Competent and Qualified Persons. As a minimum, designate Competent Persons and submit qualifications for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1910.146, 29 CFR 1915, and 29 CFR 1926, and any other Federal, State, and local regulatory requirements identified in this Contract. Identify the Qualified Person's name and qualifications, training, and experience. Delineate the Qualified Person's authority to direct work

stoppage in the event of hazardous conditions. Include procedure for rescue by Contractor personnel and the coordination with emergency responders. ~~(If there is no confined space work, include a statement that no confined space work exists and none will be created.)~~ The Contrator must provide a confined space rescue capability in accordance with EM 385-1-1 during the time any Contractor personnel are in these spaces.

d. Health Hazard Control Program. Designate a Competent and Qualified Person to establish and oversee a Health Hazard Control Program in accordance with EM 385-1-1. The program must ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical, and biological agents and that necessary controls and protective actions are instituted to ensure health.

e. A Drug and Alcohol Use Prevention Program. Provide description of the on-site prevention program.

f. Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, hazardous energy control, vehicle operator, forklift operators, personal protective equipment, arc flash); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

g. Fall Prevention and Protection Plan. The plan must be site specific and address all fall hazards in the work place and during different phases of construction (Paragraph entitled FALL HAZARD PROTECTION AND PREVENTION PROGRAM). Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A Competent Person or Qualified Person For Fall Protection prepare and sign the plan. See EM 385-1-1 for definitions of Competent and Qualified Person for Fall Protection. Include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, self-rescue, rescue and escape equipment and operations, evacuation procedures, training requirements, and monitoring methods. For Horizontal Lifelines, see EM 385-1-1, Chapter 21 and ANSI/ASSP Z359.1. Revise the Fall Protection and Prevention Plan every six months for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems, or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan at the job site for the duration of the project.

k. Site Safety and Health Plan. The safety and health aspects prepared in accordance with EM 385-1-1.

l. Polychlorinated Biphenyls (PCB) Plan. The safety and health aspects of Polychlorinated Biphenyls work, prepared in accordance with EM 385-1-1, Chapter 6.

m. Excavation Plan. The safety and health aspects prepared in accordance with EM 385-1-1.

n. Crane Critical Lift Plans. Critical lifts require detailed planning and additional or unusual safety considerations. Before making a critical lift, develop a critical lift plan. Critical lifts

are detailed in EM 385-1-1, Chapter 16. A non-mandatory Critical Lift Plan form can be found in EM 385-1-1, Chapter 16.

k. Critical Lifts are defined as:

(1) Lifts involving hazardous materials (e.g., explosives, highly volatile substances);

(2) Hoisting personnel with Load Handling Equipment (LHE);

(3) Lifts made with more than one LHE

(4) Lifts where the center of gravity could change;

(5) Lifts made when the load weight is 75 percent of the rated capacity of the LHE load chart or more (not applicable to gantry, overhead, or bridge cranes);

(6) Lifts without the use of outriggers using rubber tire load charts;

(7) Lifts using more than one hoist on the same LHE;

(8) Lifts involving Multiple Lift Rigging (MLR) Assemblies or other non-routine or technically difficult rigging arrangements;

(9) Lifts involving submerged loads.

Exception: if hand signals used by a signal person in view of the operator or radio communications are available and in use, load does not exceed two tons AND is determined a routine lift by the supervisor;

(10) Load Tests;

(11) When land-based LHE mounted on barges, pontoons or other means of flotation are required to travel while lifting the load;

(12) Any lift the operator believes should be considered critical.

o. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. Submit 15 calendar days prior to on-site work and include the requirements of EM 385-1-1, Chapter 16, ASME B30-PKG, and the following:

(1) For lifts of personnel, demonstrate compliance with the requirements of EM 385-1-1 in the plan.

(2) For barge mounted mobile cranes, perform a Naval Architectural Analysis (NAA) to determine barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. Calculate the amount of list and trim to be within the crane manufacturer's requirements.

p. Standard Lift Plan. For all crane activities prepare a written standard lift plan (SLP) for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in accordance with EM 385-1-1, Chapter 16.

q. Fatigue Management Plan (FMP). Complete a FMP as part of the APP whenever work hours:

(1) exceed 10 hours a day for more than four consecutive days;

(2) exceed 50-hours in a seven day work week;

(3) exceed 12-hours a day for more than three consecutive days, or

(4) exceed 58-hours a week for sedentary (to include office) work.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

1.9.1 General

a. Format the Activity Hazard Analysis (AHA) in accordance with EM 385-1-1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHAs as amendments to the APP. Use the analysis during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls. Develop an AHA for every operation involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or subcontractor is to perform work. The analysis must identify and evaluate hazards and outline the proposed methods and techniques for the safe completion of each phase of work. At a minimum, define activity being performed, sequence of work, specific safety and health hazards anticipated, control measures (to include personal protective equipment) to eliminate or reduce each hazard to acceptable levels, equipment to be used, inspection requirements, training requirements for all involved, and the Competent and Qualified Persons in charge of that phase of work. For work with fall hazards, include fall hazards associated with scaffold erection and removal, identify the appropriate fall arrest systems. For work with materials handling equipment, address safeguarding measures related to materials handling equipment. For work requiring excavations, include requirements for safeguarding excavations. For work on or near energized electrical equipment, address arc flash hazards and control procedures. For work with commissioning, address safeguarding measures related to commissioning.

b. An activity requiring an AHA cannot proceed until the AHA has been accepted by the CO and a meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activity, including on-site Government representatives. Document meeting attendance at the preparatory, initial, and follow-up phases of quality control inspection.

c. Continuously review and, when appropriate, modify the AHA to address changing site conditions or operations.

d. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by

the Contractor, supplier, or subcontractor and provided to the Prime Contractor for submittal to the CO.

e. Contractor may use Job Hazard Analyses, Job Safety Analyses, or similar Risk Management procedures in lieu of an AHA, provided the data collected is the same as that required by the AHA.

1.9.2 Periodic AHA Review and Updating

Review the AHAs periodically (at least monthly) at the Contractor supervisory safety meeting and update when procedures, scheduling, or hazards change. The on-site superintendent, SSHO, and Competent Persons used to develop the AHAs, including updates, must sign and date the AHAs before they are implemented.

1.10 DISPLAY OF SAFETY INFORMATION

Within one calendar day after commencement of on-site work, erect a Safety and Health Bulletin Board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the CO, that is accessible and includes all mandatory information for employee and visitor review, will be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 2-8.f. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

c. Marine Chemist Certificate (Marine Activities).

1.11 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in Paragraph entitled REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.12 EMERGENCY MEDICAL TREATMENT

Emergency medical treatment for Contract employees is the responsibility of the Contractor.

1.13 PROJECT SAFE CLEARANCE PROCEDURE

1.13.1 General

Prior to beginning work, submit a Hazardous Energy Control Plan in accordance with EM 385-1-1 and CENWP-OD-SAF-385-1. Ensure that each employee is familiar with and complies with the Lockout/Tagout Safe Clearance procedures in EM 385-1-1, CPL 02-00-147, ER 385-1-31, and Government-furnished Hazardous Energy Control Program Supplemental Procedures, as practiced by the U.S. Army Corps of Engineers, Portland District, CENWP-OD-SAF-385-1. Provide HEC instruction and training for personnel that have any involvement with electrical equipment or lines; mechanical equipment; pressure systems; and vessels and lines containing dangerous or hazardous material which can be energized, pressurized, activated, or released remotely or inadvertently. This requirement also applies to any interface of ongoing Project operations and local

procedures. Coordinate all work requiring a clearance under EM 385-1-1 and Project Specific Safe Clearance Procedures with the Government at least 24 hours in advance. No work is to proceed until the proper clearances have been obtained from the Government for the work authorized and the Contractor has signed and locked onto the principal authorized clearance. Where the requirements of this specification and referenced documents vary, the most stringent requirements apply.

1.13.2 Safe Clearance Procedure System

A safe clearance system is used by Project Personnel to ensure continuity of service and safety to personnel and equipment. Any work, service, or delivery performed which requires taking Project operating equipment out of service must be done only after a formal clearance is obtained through the Project POC. Do not violate clearance. Any violation of Safe Clearance Procedures will be grounds for removal of the offender(s) from the project. The use of locks and tags is required in the Projects Safe Clearance Procedure for all clearance points that locks can be applied. Where locks cannot be applied, apply Project Clearance Tags. The use of personal locks for individuals working under Safe Clearance is required by CPL 02-00-147 and CENWP-OD-SAF-385-1.

1.14 REPORTS

1.14.1 Accident Notification

Notify the CO as soon as practical, but no more than four hours, after any mishap meeting the definition of Recordable Injuries or Illnesses or High Visibility Mishap; meeting EM 385-1-1, Chapter 1, to include property damage equal to or greater than $5,000. In conjunction with Contract Clause 52.236-13 Alt I, ACCIDENT PREVENTION - ALTERNATE I, and EM 385-1-1, report to the Government monthly the total man-hours expended at the project site by all employees (supervisory as well as labor) together with those of all subcontractors. The reporting period will start at 12:01 a.m. the first day of each month and end as of midnight on the last day of each month. Report by telephone to the CO and Resident Engineer's office prior to the fifth day of the following month.

1.14.2 Accident or Mishap Reports

All accidents involving property damage, fires, personal equipment, and all injuries to the public, regardless of degree, must be reported to the CO and Resident Engineer on ENG Form 3394 and according to the schedule which follows:

a. Investigation and Reporting

(1) Conduct a mishap investigation for recordable injuries and illnesses, for Medical Treatment as defined in Paragraph DEFINITIONS, property damage accidents resulting in at least $5,000 in damages, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the accident or mishap reports form, ENG Form 3394, and provide the report to the CO within five calendar days of the accident.

(2) Conduct an accident investigation for any of the following High Visibility Mishap: (1) Electrical, (2) Load Handling Equipment and Rigging, (3) Fall-from-Height, (4) Underwater Diving to establish the root cause(s) of the accident. Make the initial

report within four hours, and provide a completed ENG Form 3394 to the CO within five calendar days of the accident. Do not proceed with further operations until cause is determined and corrective actions have been implemented to the satisfaction of the CO.

(3) The CO and Resident Engineer must be notified by the most expeditious means available of all fatal and permanent total disability injuries, three or more persons hospitalized, all property damage of $500,000 or more, and structural damage involving a question of structural adequacy. All incidents involving disabling injury or an injury which may result in an employee's lost time, or property damage of $5,000 or more must be reported to the CO and Resident Engineer by telephone as soon as possible and in all cases within four hours.

(4) In all accidents enumerated in sub-item (3), investigate the circumstances before the scene of the accident is changed, take corrective action, and within 48 hours forward to the CO and Resident Engineer four copies of ENG Form 3394.

(5) In the event of an accident involving a fatality, permanent total disability, hospitalization of one or more persons, or property damage of $500,000 or more, the Contractor must promptly suspend all operations at the scene of the accident and notify the CO and Resident Engineer of the occurrence. Immediately provide for the rescue and/or care of the injured. Restrict access to the area except in situations where safety may be compromised. Leave the scene undisturbed until investigated by a Government appointed board of investigation and until the Contractor is authorized to resume operations.

(6) If property damage and injury result from the same accident, the consequence may be noted on the same ENG Form 3394. If more than one person is injured in a single accident, ENG Form 3394 must be submitted for each person injured. The Resident Office staff will provide the required forms and assist in their preparation immediately upon notification of an accident.

b. Types of Accidents and Reports. For each accident that results in a consequence or combination of the consequences listed below, a complete report on ENG Form 3394 must be furnished to the CO and Resident Engineer. Please note that these reports cannot be used for any purpose other than accident reporting.

(1) Disabling injury (including death) is an injury that renders a person unable to perform a regularly established job on the day following the injury or on any subsequent day. Known suicide or deaths from natural causes are not reportable.

(2) Damage of $5,000 or more to the Contractor's property or equipment, including motor vehicles and fire and/or damage to other property caused by the Contractor while executing the Contract.

(3) Accidents occasioned by flood, hurricane, tornado, fire, navigation, wind, ice, etc., and structural failure in excess of $5,000.

1.14.3 Crane Testing Reports

Submit crane inspection reports required in accordance with Chapter 16 of EM 385-1-1, ASME B30-PKG, and as specified herein with the daily reports of inspections.

1.14.4 Certificate of Compliance

Provide a Certificate of Compliance for each crane entering an activity under this Contract (see CO for a blank certificate). State within the certificate that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance comply with 29 CFR 1926 and EM 385-1-1 Chapter 16. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. Also certify that all of its crane operators have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post certifications on the crane.

1.15 HOT WORK

a. Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting, etc.) or operating other flame-producing/spark producing devices. Submit one copy of each permit attached to each Daily Contractor Quality Control Report (Section 01 45 00.00 25 QUALITY CONTROL. Contractors are required to meet all criteria before a permit is issued. In accordance with EM 385-1-1, a fully charged fire extinguisher, minimum ten lbs. are required to be readily available in the immediate area of Hot Work. All extinguishers must have current inspection tag, approved safety pin, and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done. Train the Fire Watch in accordance with NFPA 51B and remain on-site for a minimum of 60 minutes after completion of the task or as specified on the hot work permit.

b. When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and know the emergency phone number. Report any fire, no matter how small, to the Fire Department and CO immediately.

1.16 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government are prohibited be closed or obstructed without written permission from the CO.

1.17 INCLEMENT WEATHER AND HEAT/COLD STRESS MANAGEMENT

In the event of a severe storm warning:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area for loose material, equipment, debris, and other objects that could be blown away or against existing work.

c. Ensure that temporary erosion controls are adequate.

d. Provide an INCLEMENT WEATHER AND HEAT/COLD STRESS MANAGEMENT PLANS for removing or securing plant and evacuation of personnel for floating plants in emergencies. Include this plan as part of the the AHA and meet the requirements of EM 385-1-1.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

3.1.1 General

Comply with EM 385-1-1, NFPA 241, ASME B30-PKG, the APP, the AHA, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard will prevail.

3.1.2 Hazardous Material Exclusions

Not withstanding any other hazardous material used in this Contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, and lead-based paint are prohibited. The CO, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead-based paint, friable and non-friable asbestos, and other OSHA regulated chemicals (i.e. 29 CFR 1910). If material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the CO immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to Contract Clauses 52.243-4, CHANGES, and 52.236-2, DIFFERING SITE CONDITIONS.

3.2 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

3.2.1 General

Designate a Competent or Qualified Person for Fall Protection to establish, prepare, and sign a fall protection and prevention (FP&P) plan for the protection of all employees exposed to fall hazards in accordance with ANSI/ASSP Z359.1 and EM 385-1-1. Establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. The plan will include: company policy, identify responsibilities, qualifications, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment, and rescue and evacuation procedures; and submit in the APP. Use definitions and

nomenclature in accordance with ANSI/ASSP Z359.1. Identify Competent/Qualified Persons, as required, for fall protection and maintain a list of current certificates and completed training courses for each person. Qualified and Competent Persons (See EM 385-1-1) requirements are as follows:

a. A Qualified Person must have a recognized degree or professional certificate that relates to fall protection and rescue and with extensive knowledge, training, and experience in the fall protection and rescue field and capable of designing, analyzing, evaluating, specifying, inspecting, and assembling fall protection and rescue equipment and systems. The Qualified Person must also have working knowledge of current fall protection regulations and standards, physical sciences, engineering principles, and meet the qualifications of a Competent Person.

b. A Competent Person, designated in writing by the Contractor, will be responsible for the immediate supervision, implementation, and monitoring of the Contractor's managed Fall Hazard Protection and Prevention Program, who through training and knowledge in the fall protection and rescue field, is capable of identifying, evaluating, and addressing existing and potential fall hazards, and who has the authority to take necessary corrective measures. To be qualified as a Competent Person for Fall Protection, the individual must have a minimum of 24 hours of Competent Person for Fall Protection training, with a combination of formal classroom and practical documented training. Training will be performed by a Competent Person training or a Qualified Person trainer conforming to the requirements of ANSI/ASSP Z490.1, Criteria for Accepted Practices in Safety, Health and Environmental Training. In addition, conduct Competent Person refresher training at least every two years to stay current with fall protection and rescue educational industry requirements, or when new fall protection systems are used or installed, or new fall hazards are encountered per ANSI/ASSP Z359.1. A Qualified Person may perform the duties and responsibilities of a Competent Person if their training meets the above minimum training requirements.

3.2.2 Fall Protection Equipment and Systems

3.2.2.1 General

Enforce use of the fall protection equipment and systems designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Chapter 21. In addition to the required fall protection systems, safety skiff, personal floatation devices, and life rings etc., are required when working above or next to water in accordance with EM 385-1-1, Chapters 05 and 21. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platforms. Safety requirements for work platforms suspended from cranes or derricks must comply with ASSP A10.28. In addition, personal fall restraint systems are required when operating other equipment such as scissor lifts. Fall protection must comply with EM 385-1-1, and ANSI/ASSP Z359.1.

3.2.2.2 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components must meet ANSI/ASSP Z359.1. Only a full-body harness with a shock-absorbing

lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. Body belts are prohibited, to include use in Fall Restraint. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners may be used meeting the 3,600 lb. gate strength requirement. Webbing, straps, and ropes must be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment cannot exceed six feet. The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall must always be taken into consideration when attaching a person to a fall arrest system. All harnesses must be equipped with Trauma Suspension Straps or similar to provide short-term relief from the effects of orthostatic intolerance. Equip all energy absorbers with a deployment indicator.

3.2.3 Existing Anchorage

Existing anchorages, to be used for attachment of personal fall arrest equipment, must be certified (or re-certified) by a Qualified Person for fall protection in accordance with ANSI/ASSP Z359.1. Exiting horizontal lifeline anchorages must be certified (or re-certified) by a registered professional engineer with experience in designing horizontal lifeline systems.

3.2.4 Horizontal Lifelines

Design, install, certify, and use under the supervision of a Qualified Person horizontal lifelines for fall protection as part of a complete fall arrest system in compliance with ANSI/ASSP Z359.1 and EM 385-1-1, Chapter 21.

3.2.5 Guardrails and Safety Nets

Design, install, and use guardrails and safety nets in accordance with EM 385-1-1, Chapters 21 and 19 (Marine).

3.2.6 Rescue and Evacuation Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the AHA for the phase of work, in the FP&P Plan, and the APP.

3.2.7 Aerial Lift Equipment and Movable Work Platforms

In addition to the guardrail provided, equip equipment with anchorages meeting ANSI/ASSP Z359.1. A restraint system must be used in addition to guardrails and the lanyards sufficiently short to prohibit workers from climbing out of, or being ejected from the platform.

3.2.8 Safety Monitoring System

The use of a safety monitoring system as a fall protection method is prohibited.

3.2.9 Controlled Access Zones

The use of Controlled Access Zones as a fall protection method is prohibited.

3.3 SCAFFOLDING

a. Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Access to scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system. Do not use vertical ladders commonly provided by scaffold system manufacturers for accessing scaffold platforms greater than 20 feet in height. The use of an adequate gate is required. Ensure that employees are qualified to perform scaffold erection and dismantling. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan. Attach stationary scaffolds to structural building components to safeguard against tipping forward or backward. Special care must be given to ensure scaffold systems are not overloaded. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to four times the width of the smallest dimension of the scaffold base. Place work platforms on mud sills. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

b. Scaffold must comply in every respect with EM 385-1-1. Submit type, layout, connections, and product literature for any scaffolding, ladder, stairway, or other access schemes proposed to be used. Install approved anti-slip surface material on scaffolding platforms.

3.4 EQUIPMENT

3.4.1 Load Handling Equipment (LHE)

Load Handling Equipment (LHE) must comply with ASME B30-PKG and the following:

a. Do not modify Load Handling Equipment such as forklifts with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.4.2 Cranes, Hoists, and Rigging

a. LHE as specified in EM 385-1-1, Chapter 16.

b. Comply with the LHE manufacturer's specifications and limitations

for erection and operation of LHE used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30-PKG). Perform all testing in accordance with the manufacturer's recommended procedures.

c. Comply with ASME B30-PKG, OSHA and the EM 385-1-1 for all cranes.

d. When operating in the vicinity of overhead transmission lines, operators and riggers be alert to this special hazard and follow the requirements of EM 385-1-1, Chapter 11, and ASME B30-PKG.

e. Do not use personnel work platforms (man-baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Hoisting personnel must be allowed by the LHE Manufacturer. This activity is a critical lift and a critical lift plan is required.

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

g. All employees must keep clear of loads about to be lifted and of suspended loads.

h. Use cribbing when performing lifts on outriggers.

i. Position the LHE hook/block directly over the load. Side loading of LHE is prohibited unless allowed by the manufacturer.

j. Position a physical barricade to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

k. Certification records which include the date of inspection, signature of the person performing the inspection, and make the serial number or other identifier of the LHE that was inspected available onsite at all times.

l. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane must be available onsite.

m. Certify that all LHE operators have been trained in proper use of the equipment they are authorized by type, class and capacity.

n. Certify that all LHE meet the manufactures requirements by completing and submitting the certification of compliance (COC)for in the EM 385-1-1 prior to the start of work.

o. A physical if required by the EM 385-1-1, and must be signed by a Medical Doctor (MD) or Doctor of Osteopathy (DO), for all LHE operators.

p. Plan all lifts with LHE in advance by developing a Standard lift plan (SLP) per the EM 385-1-1.

3.5 EXCAVATIONS

3.5.1 Soil Classification

Perform soil classification by a Competent Person in accordance with

EM 385-1-1.

3.5.2 Utility Locations

All underground utilities in the work area must be positively identified by a third party, independent, private utility locating company in addition to any station locating service and coordinated with the station utility department.

3.5.3 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system.

3.5.4 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever Contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Use outages to isolate utility systems in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.6 ELECTRICAL

3.6.1 Conduct of Electrical Work

Certify underground electrical spaces safe for entry before entering to conduct work. Positively identify cables that will be cut, and de-energize prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the CO and Station Utilities for identification. The CO will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. 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 must be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on

the specific job and as delineated in the Contractor's AHA.

3.6.2 Arc Flash Hazard (AFH) Program

a. Develop an AFH Program as described in ER 385-1-100. The AFH Program, at a minimum, must:

(1) Be supplemental to Engineering Regulations

(2) Identify an AFH Coordinator

(3) Identify AFH Qualified Personnel

(4) Identify personnel roles and responsibilities

(5) Provide details on and contain AFH analyses

(6) Procedures to address DC, single-phase and high voltage

(7) Define appropriate hazard mitigation

(8) Provide for integration of controls into work activities

(9) Provide Personal Protective Equipment (PPE) policies and procedures

(10) Describe labeling procedures

(11) Provide training procedures and methods

(12) Describe inspections and program review procedures

(13) Detail mishap reporting procedures

(14) Describe documentation and recordkeeping procedures

(15) Be made available to all personnel with potential exposure to AFHs

(16) Include provisions:

(a) that violators of the policy will be subject to appropriate disciplinary action

(b)for reporting violations of AFH Program and/or procedures

(17) Include facility-specific information

b. Prior to beginning work on any equipment where an AFH exists, attend a coordination meeting with the CO and the Government AFH coordinator to review the Contractor AFH Program.

3.7 WORK IN CONFINED SPACES

Comply with the requirements in Chapter 34 of EM 385-1-1, OSHA 29 CFR 1915 (marine works), OSHA Directive CPL 2.100, and OSHA 29 CFR 1926. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures - Prohibit entry into a confined space by personnel for any purpose, including hot work, until the Qualified Person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. See EM 385-1-1, for entry procedures. Review all hazards pertaining to the space with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.

c. Ensure the use of rescue and retrieval devices in confined spaces greater than five feet in depth. Conform to Chapter 34 of EM 385-1-1.

d. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

e. Include training information for employees who will be involved as entrants and attendants for the work. Conform to Chapter 34 of EM 385-1-1.

f. Post the confined space entry permit in a conspicuous place close to the confined space entrance.

3.8 CRYSTALLINE SILICA

Grinding, abrasive blasting, and foundry operations of construction materials containing crystalline silica, must comply with OSHA regulations, such as 29 CFR 1910.94, and EM 385-1-1, Chapter 6. Develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

3.9 DUST CONTROL

In addition to the dust control measures required elsewhere in the Contract documents, dry cutting of brick or masonry is prohibited. Address control of water runoff for wet cutting.

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METAL FABRICATIONS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (ASNT)

ANSI/ASNT CP-189	(2020) ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B4.1	(1967; R 1994; R 2004; R 2009; R 2020) Preferred Limits and Fits for Cylindrical Parts
ASME B18.21.1	(2009; R 2016) Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series)
ASME B46.1	(2020) Surface Texture, Surface Roughness, Waviness and Lay

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2025) Structural Welding Code - Steel
AWS D1.6/D1.6M	(2017) Structural Welding Code – Stainless Steel
AWS QC1	(2016) Specification for AWS Certification of Welding Inspectors

ASTM INTERNATIONAL (ASTM)

ASTM A193/A193M	(2025) Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service and Other Special Purpose Applications
ASTM A194/A194M	(2024) Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both
ASTM A380/A380M	(2025) Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems

ASTM E165/E165M	(2023) Standard Practice for Liquid Penetrant Examination for General Industry
ASTM E709	(2021) Standard Guide for Magnetic Particle Testing
ASTM F436	(2011) Hardened Steel Washers
ASTM F3125/F3125M	(2019) Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength

RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC)

RCSC A348	(2020) RCSC Specification for Structural Joints Using High-strength Bolts

1.2 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings; G, DO

Welding Procedures; G, DO

Welding Repair Plan

SD-03 Product Data

Filler Metal

Lubricant

SD-06 Test Reports

Tests, Inspections, and Verifications

SD-07 Certificates

Welding Qualifications

Weld Inspection Log

Certified Welding Inspector; G, DO

Nondestructive Testing Personnel; G, DO

1.3 QUALITY ASSURANCE

1.3.1 Detail Drawings

Submit detail drawings for metalwork and machine work, prior to fabrication, include within the detail drawings catalog cuts, templates, fabrication and assembly details and type, grade and class of material as appropriate. Indicate methods of protecting the work during shipping, storage, field assembly, and installation.

1.3.2 Welding Qualifications

Prior to welding, submit certification for each welder stating the type of welding and positions qualified for, the code and procedure qualified under, date qualified, and the firm and individual certifying the qualification tests. If the qualification date of the welder or welding operator is more than 6 months old, accompany the welding operator's qualification certificate with a current certificate by the welder attesting to the fact that he has been engaged in welding since the date of certification, with no break in welding service greater than 6 months.

Conform to all requirements specified in AWS D1.1/D1.1M, or AWS D1.6/D1.6M as applicable to the material to be welded.

PART 2 PRODUCTS

2.1 FABRICATION

2.1.1 Steel Fabrication

Material must be straight before being laid off or worked. Perform straightening, if necessary, by methods that will not impair the metal. Sharp kinks or bends are cause for rejection of the material. Material with welds will not be accepted except where welding is definitely specified, indicated or otherwise approved. Make bends using approved dies, press brakes or bending rolls. Where heating is required, take precautions to avoid overheating the metal and allow it to cool in a manner that will not impair the original properties of the metal. Proposed flame cutting of material is subject to approval and must be indicated on detail drawings. Shearing must be accurate and all portions of the work neatly finished. Make corners square and true unless otherwise shown. Fillet re-entrant cuts to a minimum radius of 3/4 inch unless otherwise approved. Provide finished members free of twists, bends and open joints. Tighten bolts, nuts and screws.

2.1.1.1 Dimensional Tolerances for Work

Measure dimensions using an approved calibrated steel tape of approximately the same temperature as the material being measured. The overall dimensions of an assembled structural unit must be within the tolerances indicated on the drawings or as specified in the particular section of these specifications for the item of work. Where tolerances are not specified in other sections of these specifications or shown, an allowable variation of 1/32 inch is permissible in the overall length of component members with both ends milled; component members without milled ends must not deviate from the dimensions shown by more than 1/16 inch for members 30 feet or less in length, and by more than 1/8 inch for members over 30 feet in length.

2.1.1.2 Carbon Steel Fabrication

Carbon steel may be cut by mechanically guided or hand-guided torches, provided an accurate profile with a surface that is smooth and free from cracks and notches is obtained. Prepare surfaces and edges in accordance with AWS D1.1/D1.1M, Prequalification of WPSs Clause. Where carbon steel is not to be welded, chipping or grinding will not be required except as necessary to remove slag and sharp edges of mechanically guided or hand-guided cuts not exposed to view. Chip, grind or machine to sound metal hand-guided cuts which are to be exposed or visible.

2.1.1.3 Stainless Steel Fabrication

Stainless steel may be cut by mechanically guided or hand-guided torches, provided an accurate profile with a surface that is smooth and free from cracks and notches is obtained. Prepare surfaces and edges in accordance with AWS D1.6/D1.6M, Prequalification of WPSs Clause. Where stainless steel is not to be welded, chipping or grinding will not be required except as necessary to remove slag and sharp edges of mechanically guided or hand-guided cuts not exposed to view. Chip, grind or machine to sound metal hand-guided cuts which are to be exposed or visible. Prevent carbon contamination by isolating carbon components from stainless components. Cross contamination will require repassivation.

2.1.2 Welding

2.1.2.1 Welding of Steel

2.1.2.1.1 Welding Procedures for Steel

Use prequalified welding procedures for steel as described in AWS D1.1/D1.1M, or AWS D1.6/D1.6M Prequalification of WPSs Clause or qualify by tests as prescribed in AWS D1.1/D1.1M or AWS D1.6/D1.6M, Qualification Clause as applicable. For welding procedures qualified by tests, the coupon welding and specimen testing will be witnessed and the test report document signed by the Contracting Officer. Approval of any welding procedure does not relieve the Contractor of the responsibility for producing a finished structure meeting all requirements of these specifications. The Contractor will be directed or authorized to make any changes in previously approved welding procedures that are deemed necessary or desirable by the Contracting Officer.

a. Submit a complete schedule of welding procedures for each steel structure to be welded prior to commencing fabrication. Provide the schedule in conformance with the requirements specified in the provisions of AWS D1.1/D1.1M or AWS D1.6/D1.6M as applicable.

b. Provide within the schedule detailed procedure specifications and tables or diagrams showing the procedures to be used for each required joint. Include in the welding procedures filler metal, preheat, interpass temperature and stress-relief heat treatment requirements. Clearly identify each welding procedure as being prequalified or required to be qualified by tests.

c. Show types and locations of welds designated or in the specifications to receive nondestructive testing in the welding procedures.

2.1.2.1.2 Welding Process

Perform welding of steel by an electric arc welding process using a method which excludes the atmosphere from the molten metal and conforms to the applicable provisions of AWS D1.1/D1.1M or AWS D1.6/D1.6M as applicable for the material to be welded. Minimize residual stresses, distortion and shrinkage from welding.

2.1.2.1.3 Welding Technique

2.1.2.1.3.1 Filler Metal

Provide the electrode, electrode-flux combination and grade of filler metal conforming to the appropriate AWS specification for the base metal and welding process being used or be as shown where a specific choice of AWS specification allowables is required. Submit filler metal product data. Include the AWS designation of the electrodes to be used in the schedule of welding procedures. Use only low hydrogen electrodes for manual shielded metal-arc welding regardless of the thickness of the steel. Use a controlled temperature storage oven at the job site as prescribed by AWS D1.1/D1.1M or AWS D1.6/D1.6M, Fabrication Clause to maintain low moisture of low hydrogen electrodes.

2.1.2.1.3.2 Preheat and Interpass Temperature

Perform preheating as required by AWS D1.1/D1.1M or AWS D1.6/D1.6M, Fabrication Clause or as otherwise specified except that the temperature of the base metal must be at least 70 degrees F. Slowly and uniformly preheat the joint area by approved means to the prescribed temperature, held at that temperature until the welding is completed and then permitted to cool slowly in still air.

2.1.2.1.3.3 Stress-Relief Heat Treatment

Where stress relief heat treatment is specified or shown, perform in accordance with the requirements of AWS D1.1/D1.1M or AWS D1.6/D1.6M, Fabrication Clause unless otherwise authorized or directed.

2.1.2.1.4 Workmanship

Perform welding workmanship in accordance with AWS D1.1/D1.1M or AWS D1.6/D1.6M, Fabrication Clause and other applicable requirements of these specifications.

2.1.2.1.4.1 Preparation of Base Metal

Prior to welding inspect surfaces to be welded to ensure compliance with AWS D1.1/D1.1M or AWS D1.6/D1.6M, Fabrication Clause.

2.1.2.1.4.2 Temporary Welds

Make temporary welds, required for fabrication and erection, under the controlled conditions prescribed for permanent work. Make temporary welds using low-hydrogen welding electrodes and by welders qualified for permanent work as specified in these specifications. Conduct preheating for temporary welds as required by AWS D1.1/D1.1M or AWS D1.6/D1.6M for permanent welds except that the minimum temperature must be 120 degrees F in any case. In making temporary welds, do not strike arcs in other than weld locations. Remove each temporary weld and grind flush with adjacent

surfaces after serving its purpose.

2.1.2.1.4.3 Tack Welds

Tack welds that are to be incorporated into the permanent work are to exhibit the same quality requirements as the permanent welds; clean and thoroughly fuse them with permanent welds. Perform preheating as specified above for temporary welds. Provide cascaded ends on multiple-pass tack welds. Remove defective tack welds before permanent welding.

2.1.2.2 Welding of Steel Castings

Remove unsound material from the surfaces of steel castings, to be incorporated into welded connections, by chipping, machining, air-arc gouging or grinding. Do not weld major connections designed for transfer of stresses if the temperature of the casting is lower than 100 degrees F. Preheat castings containing over 0.35 percent carbon or over 0.75 percent manganese to a temperature not to exceed 450 degrees F and conduct welding while the castings are maintained at a temperature above 350 degrees F. Welding is not permitted on castings containing carbon in excess of 0.45 percent except on written authorization. Castings requiring welding repairs after the first annealing and castings involving welding fabrication must be stress-relieved annealed prior to receiving final machining unless otherwise permitted.

2.1.2.3 Welding of Stainless Steel and Stainless Steel to Carbon Steel

Welding of stainless steel and stainless steel to carbon steel must conform to the requirements of AWS D1.6/D1.6M. Submit a certified report giving the results of the qualifying tests, and a complete schedule of the welding process for each steel fabrication to be welded prior to commencing fabrication.

2.1.3 Bolted Connections

2.1.3.1 Bolted Steel Connections

~~Provide~~Furnish all new hardware including studs, bolts, nuts, and washers of the type specified or indicated on as-built drawings as required to fully assemble all components. Where modern equivalencies are required, conform bolts and studs to ASTM A193/A193M and nuts to ASTM A194/A194M.~~.~~ Equip all nuts with washers except for high strength bolts. Use Type 304 stainless steel washers conforming to ASME B18.21.1 for stainless steel connections. Use washers conforming to ASTM F436 for non-stainless steel connections. Use beveled washers where bearing faces have a slope of more than 1:20 with respect to a plane normal to the bolt axis. Where the use of high strength bolts is specified or indicated, conform the materials, workmanship and installation to the applicable provisions of ASTM F3125/F3125M. Install High Strength Bolts ASTM F3125/F3125M Grade A325 or Grade A490 in accordance with the requirements of RCSC A348. All High Strength Bolted Connections are fully pretensioned to the minimum pretension as specified in RCSC A348. Follow the pre-installation verification procedures outlined in RCSC A348. All other bolted connections are snug tight in accordance with RCSC A348.

a. Accurately locate bolt holes, smooth, perpendicular to the member and cylindrical.

b. Drill or subdrill holes for regular bolts and ream in the shop and not more than 1/16 inch larger than the diameter of the bolt.

c. Match-ream or drill holes for fitted bolts in the shop. Remove burrs resulting from reaming. Keep bolt threads entirely outside of the holes. The body diameter of bolts must have tolerances as recommended by ASME B4.1 for the class of fit specified. Place fitted bolts in reamed holes by selective assembly to provide an LN-2 fit.

d. Holes for high strength bolts must not have diameters more than 1/16 inch larger than bolt diameters. If the thickness of the material is not greater than the diameter of the bolts, the holes may be punched. If the thickness of the material is greater than the diameter of the bolts the holes may be drilled full size or subpunched or subdrilled at least 1/8 inch smaller than the diameter of the bolts and then reamed to full size. Poor matching of holes will be cause for rejection. Drifting occurring during assembly cannot distort the metal or enlarge the holes. Reaming to a larger diameter of the next standard size bolt will be allowed for slight mismatching.

2.1.4 Machine Work

a. Tolerances, allowances and gauges for metal fits between plain, non-threaded, cylindrical parts conform to ASME B4.1 for the class of fit shown or required unless otherwise shown on approved detail drawings. Where fits are not shown they will be suitable as approved. Tolerances for machine-finished surfaces designated by non-decimal dimensions must be within 1/64 inch. Tolerances for machine-finished surfaces designated by decimal dimensions must be as follows unless otherwise specified:

1 place.....0.030

2 places.....0.030

3 places.....0.010

b. Sufficient machining stock will be allowed on placing pads to ensure true surfaces of solid material. Provide finished contact or bearing surfaces true and exact to secure full contact. Polish journal surfaces and finish all surfaces with sufficient smoothness and accuracy to ensure proper operation when assembled. Accurately machine parts entering any machine and all like parts be interchangeable except that parts assembled together for drilling or reaming of holes or machining will not be required to be interchangeable with like parts.

2.1.4.1 Finished Surfaces

Provide surface finishes, indicated or specified, in accordance with ASME B46.1. Values of required roughness heights are arithmetical average deviations expressed in microinches. These values are maximum. Lesser degrees will be satisfactory unless otherwise indicated. Compliance with surface requirements is determined by sense of feel and visual inspection of the work compared to Roughness Comparison Specimens in accordance with the provisions of ASME B46.1. Values of roughness width and waviness height must be consistent with the general type of finish specified by roughness height. Where the finish is not indicated or specified use that which is most suitable for the particular surface, provide the class of

fit required and be indicated on the detail drawings by a symbol which conforms to ASME B46.1 when machine finishing is provided. Flaws such as scratches, ridges, holes, peaks, cracks or checks which make the part unsuitable for the intended use will be cause for rejection.

2.1.4.2 Unfinished Surfaces

Lay out all work to secure proper matching of adjoining unfinished surfaces unless otherwise directed. Where there is a large discrepancy between adjoining unfinished surfaces chip and grind smooth or machine to secure proper alignment. Unfinished surfaces must be true to the lines and dimensions shown and be chipped or ground free of all projections and rough spots. Fill in depressions or holes not affecting the strength or usefulness of the parts in an approved manner.

2.1.4.3 Bolt Holes

Bolt holes must be accurately located, smooth, cylindrical, and perpendicular to the member. The work must be done to ensure the interchangeability of parts. Holes for bolts must have diameters not more than 1/16-inch larger than bolt diameters, unless required by the Contractor's design or contract or reference drawings. Holes that do not match with 1/64" will be cause for rejection. Hole location drifting occurring during manufacturing must not distort the metal or enlarge the holes.

a. If the thickness of the material is not greater than the diameter of the bolt: Holes may be punched.

b. If the thickness of the material is greater than the diameter of the bolt: Holes may be drilled full size or sub-punched or sub-drilled at least 1/8-inch smaller than the diameter of the bolts and then reamed to full size.

2.1.5 Miscellaneous Provisions

2.1.5.1 Cleaning of Corrosion-Resisting Steel

Remove oil, paint and other foreign substances from corrosion-resisting steel surfaces after fabrication. Perform cleaning by vapor degreasing or by the use of cleaners of the alkaline, emulsion or solvent type. After the surfaces have been cleaned give a final rinsing with clean water followed by a 24 hour period during which the surfaces are intermittently wet with clean water and then allowed to dry for the purpose of inspecting the clean surfaces. Visually inspect the surfaces for evidence of paint, oil, grease, welding slag, heat treatment scale, iron rust or other forms of contamination. If evidence of foreign substance is found, clean again in accordance with the applicable provisions of ASTM A380/A380M. Furnish the proposed method of treatment for approval. Visually reinspect after treatment. Use only stainless steel or nonmetallic bristle brushes to remove foreign substances. Remove any contamination occurring subsequent to the initial cleaning by one or more of the methods indicated above.

2.1.5.2 Lubrication

Provide the arrangement and details for lubrication as indicated. Thoroughly clean and lubricate, with an appropriate lubricant, all bearing surfaces before erection or assembly. Prior to use of the lubricant submit for approval product data supporting its use in the assembly that

includes the following lubricating properties as they apply, temperature range, protection against corrosion, ability to remain in bearing, ability to seal out contaminants, cooling and friction.

2.1.6 Shop Assembly

Assemble each machinery and structural unit furnished in the shop to determine the correctness of the fabrication and matching of the component parts unless otherwise specified. Do not exceed those tolerances shown. Closely check each unit assembled to ensure that all necessary clearances have been provided and that binding does not occur in any moving part. Assembly in the shop must be in the same position as final installation in the field unless otherwise specified. Perform assembly and disassembly work in the presence of the Contracting Officer unless waived in writing. Immediately remedy errors or defects disclosed by the Contractor without cost to the Government. Before disassembly for shipment match-mark each piece of a machinery or structural unit to facilitate erection in the field. Indicate the location of match-marks by circling with a ring of white paint after the shop coat of paint has been applied or as otherwise directed.

2.2 TESTS, INSPECTIONS, AND VERIFICATIONS

Perform material tests and analyses certified by an approved laboratory to demonstrate that materials are in conformity with the specifications. These tests and analyses must be performed and certified at the Contractor's expense. Perform tests, inspections, and verifications conforming to the requirements of the particular sections of these specifications for the respective items of work unless otherwise specified or authorized. Conduct tests in the presence of the Contracting Officer if so required. Furnish specimens and samples for additional independent tests and analyses upon request by the Contracting Officer. Properly label specimens and samples and prepare for shipment. Submit certified test reports for materials with all materials delivered to the site.

2.2.1 Nondestructive Testing

When doubt exists as to the soundness of any material part, such part may be subjected to any form of nondestructive testing determined by the Contracting Officer. This may include ultrasonic, magnaflux, dye penetrant, x-ray, gamma ray or any other test that will thoroughly investigate the part in question. The cost of such investigation will be borne by the Government if the part is found to be sound and by the Contractor if the part is found to be defective. Any defects will be cause for rejection; replace and retest rejected parts at the Contractor's expense.

2.2.2 Tests of Machinery and Structural Units

The details for tests of machinery and structural units must conform to the requirements of the particular sections of these specifications covering these items. Assemble each complete machinery and structural unit and test them in the shop, in the presence of the Contracting Officer, unless otherwise directed. Waiving of tests does not relieve the Contractor of responsibility for any fault in operation, workmanship or material that occurs before the completion of the contract or guarantee. After being installed at the site, operate each complete machinery or structural unit through a sufficient number of complete cycles to demonstrate to the satisfaction of the Contracting Officer that it meets

the specified operational requirements in all respects.

2.2.3 Inspection of Steel Welding

Nondestructive testing of designated welds will be required. Supplemental examination of any joint or coupon cut from any location in any joint may also be required.

2.2.3.1 Visual Examination

All visual inspection will be conducted in accordance with AWS D1.1/D1.1M or AWS D1.6/D1.6M, by a Certified Welding Inspector. Document this inspection in the Visual Weld Inspection Log. Submit certificates indicating that certified welding inspectors meet the requirements of AWS QC1.

2.2.3.2 Nondestructive Testing

Perform as designated or described in the sections of these specifications, the nondestructive testing of shop and field welds covering the particular items of work. Record final nondestructive testing results in the Weld Inspection Log which identifies final NDT inspection of all welds requiring inspection and submit the log.

2.2.3.2.1 Testing Agency

The nondestructive testing of welds and the evaluation of tests as to the acceptability of the welds must be performed by a testing agency adequately equipped and competent to perform such services or by the Contractor using suitable equipment and qualified personnel. All personnel performing nondestructive testing must be certified Level I or II in the method of NDT being utilized in accordance with ANSI/ASNT CP-189. Level I inspectors must have direct supervision of a Level II inspector. Submit certification for nondestructive testing personnel prior to all testing. In either case, written approval of the examination procedures is required and performance of the examination tests must be done in the presence of the Contracting Officer. The evaluation of tests are subject to the approval and all records become the property of the Government.

2.2.3.2.2 Examination Procedures

Conform to the following requirements.

2.2.3.2.2.1 Ultrasonic Testing

Examine, evaluate and report ultrasonic testing of welds in conformance to the requirements of AWS D1.1/D1.1M or AWS D1.6/D1.6M, Inspection Clause, for cyclically loaded connections. Provide ultrasonic equipment capable of making a permanent record of the test indications. Make a record of each weld tested.

2.2.3.2.2.2 Magnetic Particle Inspection

Conform magnetic particle inspection of welds to the applicable provisions of ASTM E709.

2.2.3.2.2.3 Dye Penetrant Inspection

Perform dye penetrant inspection of welds conforming to the applicable

provisions of ASTM E165/E165M.

2.2.3.2.3 Welds to be Subject to Nondestructive Testing

Test 50 percent of CJP welds using ultrasonic testing per Table 6.2 of AWS D1.1/D1.1M or AWS D1.6/D1.6M. Randomly test 50 percent of all PJP and fillet welds or as indicated by magnetic particle or dye penetrant testing.

2.2.3.3 Test Coupons

The Government reserves the right to require the Contractor to remove coupons from completed work when doubt as to soundness cannot be resolved by nondestructive testing. When coupons are removed from any part of a structure, repair the members cut in a neat manner with joints of the proper type to develop the full strength of the members. Peen repaired joints as approved or directed to relieve residual stress. The expense for removing and testing coupons, repairing cut members and the nondestructive testing of repairs is borne by the Government or the Contractor in accordance with the Contract Clauses INSPECTION AND ACCEPTANCE.

2.2.3.4 Supplemental Examination

When the soundness of any weld is suspected of being deficient due to faulty welding or stresses that might occur during shipment or erection, the Government reserves the right to perform nondestructive supplemental examinations before final acceptance. The cost of such inspection will be borne by the Government.

2.2.4 Welding Repair Plan

Repair defective welds in accordance with AWS D1.1/D1.1M or AWS D1.6/D1.6M, Fabrication Clause as applicable. Remove defective weld metal to sound metal by use of air carbon-arc or oxygen gouging. Thoroughly clean surfaces before welding. Retest welds that have been repaired by the same methods used in the original inspection. Except for the repair of members cut to remove test coupons and found to have acceptable welds costs of repairs and retesting will be borne by the Contractor. Submit welding repair plans for steel, prior to making repairs.

PART 3 EXECUTION

3.1 INSTALLATION

Thoroughly clean all parts to be installed. Remove packing compounds, rust, dirt, grit and other foreign matter. Clean holes and grooves for lubrication. Examine enclosed chambers or passages to make sure that they are free from damaging materials. Where units or items are shipped as assemblies they will be inspected prior to installation. Disassembly, cleaning and lubrication will not be required except where necessary to place the assembly in a clean and properly lubricated condition. Do not use pipe wrenches, cold chisels or other tools likely to cause damage to the surfaces of rods, nuts or other parts used for assembling and tightening parts. Tighten bolts and screws firmly and uniformly but take care not to overstress the threads. When a half nut is used for locking a full nut place the half nut first followed by the full nut. Lubricate threads of all bolts except high strength bolts, nuts and screws with an appropriate lubricant before assembly. Coat threads of corrosion-resisting steel bolts and nuts with an approved antigalling

compound. Driving and drifting bolts or keys will not be permitted.

3.1.1 Alignment and Setting

Accurately align each machinery or structural unit by the use of steel shims or other approved methods so that no binding in any moving parts or distortion of any member occurs before it is fastened in place. The alignment of all parts with respect to each other must be true within the respective tolerances required. Set true machines to the elevations shown.

3.2 TESTS

3.2.1 Workmanship

Workmanship must be of the highest grade and in accordance with the best modern practices to conform with the specifications for the item of work being furnished.

3.2.2 Production Welding

Perform production welding conforming to the requirements of AWS D1.1/D1.1M or AWS D1.6/D1.6M, as applicable. Studs, on which pre-production testing is to be performed, must be welded in the same general position as required on production items (flat, vertical, overhead or sloping). Test and production stud welding will be subjected to visual examination or inspection. If the reduction of the length of studs becomes less than normal as they are welded, stop welding immediately and do not resume until the cause has been corrected.

3.3 PROTECTION OF FINISHED WORK

3.3.1 Machined Surfaces

Thoroughly clean foreign matter off machined surfaces. Protect all finished surfaces. Oil and wrap unassembled pins and bolts with moisture resistant paper or protect them by other approved means. Wash finished surfaces of ferrous metals to be in bolted contact, with an approved rust inhibitor and coat them with an approved rust resisting compound for temporary protection during fabrication, shipping and storage periods. Paint finished surfaces of metals which will be exposed after installation, except corrosion resisting steel or nonferrous metals as specified in Section 09 97 02.00 25 PAINTING: HYDRAULIC STRUCTURES.

3.3.2 Lubrication After Assembly

After assembly fill all lubricating systems with the appropriate lubricant and apply additional lubricant at intervals as required to maintain the equipment in satisfactory condition until acceptance of the work.

<CTR> -- End of Section --</CTR>