SOLICITATION

FOR

SMALL BUSINESS
MULTIPLE AWARD CONSTRUCTION CONTRACT
(SB MACC)

at

VARIOUS LOCATIONS
STATE OF HAWAII

PREPARED BY:

NAVAL FACILITIES ENGINEERING COMMAND HAWAII
Capital Improvements Business Line
400 Marshall Road
Pearl Harbor, Hawaii 96860

REQUEST FOR PROPOSAL APPROVED BY:

Specification: _____
J.B. Enoka, P.E.

For Commander, NAVFAC: _____
C.S. Higa, P.E.

Date: 7/22/16

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SECTION 01 11 00

SUMMARY OF WORK
08/15

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals
Salvage Plan; G

1.2 WORK COVERED BY CONTRACT DOCUMENTS

1.2.1 Project Description

The work includes products and material, including installation, as indicated in the work scope and project description of each task order and incidental related work.

1.2.2 Location

The work is located as indicated in each task order, approximately as indicated. The exact location will be shown by the Contracting Officer.

1.3 OCCUPANCY OF PREMISES

Building(s) may be occupied during performance of work under this Contract. Occupancy notifications will be posted in a prominent location in the work area.

Before work is started, arrange with the Contracting Officer a sequence of procedure, means of access, space for storage of materials and equipment, and use of approaches, corridors, and stairways.

1.4 EXISTING WORK

In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements":

a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work must be in a condition equal to or better than that which existed before new work started.

1.5 LOCATION OF UNDERGROUND UTILITIES

Obtain digging permits prior to start of excavation, and comply with Installation requirements for locating and marking underground utilities. Contact local utility locating service a minimum of 48 hours prior to excavating, to mark utilities, and within sufficient time required if work occurs on a Monday or after a Holiday. Verify existing utility locations indicated on contract drawings, within area of work.

Identify and mark all other utilities not managed and located by the local utility companies. Scan the construction site with Ground Penetrating Radar (GPR), electromagnetic, or sonic equipment, and mark the surface of the ground, pier deck or paved surface where existing underground utilities or utilities encased in pier structures are discovered. Verify the elevations of existing piping, utilities,and any type of underground or encased obstruction not indicated, or specified to be removed, that is indicated or discovered during scanning, in locations to be traversed by piping, ducts, and other work to be conducted or installed. Verify elevations before installing new work closer than nearest manhole or other structure at which an adjustment in grade can be made.

1.5.1 Notification Prior to Excavation

Notify the Contracting Officer at least 48 hours prior to starting excavation work.

1.6 GOVERNMENT-FURNISHED MATERIAL AND EQUIPMENT

Pursuant to Contract Clause "FAR 52.245-1, Government Property", the Government will furnish the following materials and equipment for installation by the Contractor as indicated in each task order.

1.6.1 Delivery Schedule

Notify the Contracting Officer in writing at least 60 calendar days in advance of the date on which the materials and equipment are required. Pick up materials and equipment no later than 30 calendar days after such date. When materials and equipment are not picked up by the 30th day, the Contractor will be charged for storage at the rate of specified in each task order.

1.6.2 Delivery Location

The materials and equipment are located at a location indicated in each task order.

1.7 NAVY AND MARINE CORPS (NMCI) COORDINATION REQUIREMENTS

1.7.1 NMCI Contractor Access

Allow the NMCI Contractor access to the facility towards the end of construction (finishes 90 percent complete, rough-in 100 percent complete, Inside Plant (ISP)/Outside Plant (OSP) infrastructure in place) to provide equipment in the telecommunications rooms and make final connections. Coordinate efforts with the NMCI Contractor to facilitate joint use of building spaces during the final phases of construction. After the Contracting Officer has facilitated coordination meetings between the two contractors, within one week, incorporate the effort of additional coordination with the NMCI Contractor into the construction schedule to

demonstrate a plan for maintaining the contract duration.

1.8 SALVAGE MATERIAL AND EQUIPMENT

Items designated by the Contracting Officer to be salvaged remain the property of the Government. Segregate, itemize, deliver and off-load the salvaged property at the Government designated storage area located within the contract area or where indicated in each task order.

Provide a salvage plan, listing material and equipment to be salvaged, and their storage location. Maintain property control records for material or equipment designated as salvage. Use a system of property control that is approved by the Contracting Officer. Store and protect salvaged materials and equipment until disposition by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS
11/11

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 State

"State" when used in reference to states of the United States also includes the Territory of Guam.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Visit Request for Pearl Harbor Naval Shipyard Form (PHNSY 14ND-SYD-5512/28); G

Completed Special Access Determination (NAVSEA 5510/15); G

Pier parking authorization; G

Government guard services; G

List of Contact Personnel; G

Personnel List; G

Vehicle List; G

Statement of Acknowledgement Form SF 1413; G

1.3 SPECIAL SCHEDULING REQUIREMENTS

Provide Special Scheduling Requirements as indicated in each task order.

1.4 CONTRACTOR ACCESS AND USE OF PREMISES

1.4.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. Ingress and egress of Contractor vehicles at the Activity is limited to the H-3 gate. To minimize traffic congestion, delivery of materials must be outside of peak traffic hours (6:30 to 8:00 a.m. and 3:30 to 5:00 p.m.) unless otherwise approved by the Contracting Officer.Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. Mark Contractor equipment for identification.

1.4.1.1 Subcontractors and Personnel Contacts

Provide a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

1.4.1.2 Identification Badges and Installation Access

Application for and use of badges will be as directed. Obtain access to the installation by participating in the Navy Commercial Access Control System (NCACS), or by obtaining passes each day from the Base Pass and Identification Office. Costs for obtaining passes through the NCACS are the responsibility of the Contractor. One-day passes, issued through the Base Pass and Identification Office, will be furnished without charge. Furnish a completed EMPLOYMENT ELIGIBILITY VERIFICATION (DHS FORM I-9) form for all personnel requesting badges. This form is available at http://www.uscis.gov/portal/site/uscis by searching or selecting Employment Verification (Form I-9) _. Immediately report instances of lost or stolen badges to the Contracting Officer.

a. NCACS Program: NCACS is a voluntary program in which Contractor personnel who enroll, and are approved, are subsequently granted access to the installation for a period up to one year, or the length of the contract, whichever is less, and are not required to obtain a new pass from the Base Pass and Identification Office for each visit. The Government performs background screening and credentialing. Throughout the year the Contractor employee must continue to meet background screening standards. Periodic background screenings are conducted to verify continued NCACS participation and installation access privileges. Under the NCACS program, no commercial vehicle inspection is required, other than for Random Anti-Terrorism Measures (RAM) or in the case of an elevation of Force Protection Conditions (FPCON). Information on costs and requirements to participate and enroll in NCACS is available at http://www.rapidgate.com or by calling 1-877-727-4342.

b. One-Day Passes: Participation in the NCACS is not mandatory, and if the Contractor chooses to not participate, the Contractor's personnel will have to obtain daily passes, be subject to daily mandatory vehicle inspection, and will have limited access to the installation. The Government will not be responsible for any cost or lost time associated with obtaining daily passes or added vehicle inspections incurred by non-participants in the NCACS.

1.4.1.3 FISC Pearl Harbor Safety/Security Policy

Non-FISC personnel requiring access to FISC property must check in at the Fuel Department, FISC Operations Division, B1757 1st deck, at the beginning and end of each work day. Keys to Fuel Facilities will be issued daily between the hours of 6:30 a.m. and 4:00 p.m. Keys must be returned by 7:00 p.m. the same day. An after-hours drop box is located outside B1757.

At the end of each workday, update the check-in board in the FISC Operations Division and provide information as follows for the next workday:

a. Contract name or number

b. Name of person responsible for work crew(s)

c. Emergency phone numbers

d. Number of workers in crew

e. Location of work

f. Type of work to be conducted

g. FISC support required:

1) Transportation

2) Draining of pipe

3) Outages

4) Elevator use

5) Other

Route hot work permits to the FISC Fuel Department (Code 701) for approval. Following approval, submit permit to the Federal Fire Department (FFD). After approval by the FFD, submit a copy of the permit and the Marine Chemist Gas Free Certificate to the Fuels Operations Division for record.

1.4.1.4 No Smoking Policy

Smoking is prohibited within and outside of all buildings on installations under the cognizance of NAVFAC except in designated smoking areas. This applies to existing buildings, buildings under construction and buildings under renovation. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines. The Contracting Officer will identify designated smoking areas.

1.4.2 Working Hours

Regular working hours must consist of an 8 1/2 hour period, between 7:00 a.m. to 3:30 p.m., Monday though Friday, excluding Government holidays.

1.4.3 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 21 calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. During periods of darkness, the different parts of the work must be lighted in a manner approved by the Contracting Officer. Make utility cutovers after normal working hours or on Saturdays, Sundays, and Government holidays unless directed otherwise.

1.4.4 Occupied Buildings

The Contractor shall be working in an existing building and around existing buildings which are occupied. Do not enter the buildings without prior

approval of the Contracting Officer.

The existing buildings and their contents must be kept secure at all times. Provide temporary closures as required to maintain security as directed by the Contracting Officer.

Provide dust covers or protective enclosures to protect existing work that remains and Government material located in the building during the construction period.

Relocate movable furniture as required to perform the work, protect the furniture, and replace the furniture in its original locations upon completion of the work. Leave attached equipment in place, and protect them against damage, or temporarily disconnect, relocate, protect, and reinstall them at the completion of the work.

1.4.5 Utility Cutovers and Interruptions

a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."

b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.

c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, compressed air, are considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours." Such interruptions are further limited to approved hours. This time limit includes time for deactivation and reactivation.

d. Operation of Station Utilities: The Contractor must not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor must notify the Contracting Officer giving reasonable advance notice when such operation is required.

1.4.6 SHIPYARD AREA WORK CLEARANCE REQUEST

Coordinate excavation and electrical work, including testing and trouble shooting of circuits, within the Pearl Harbor Shipyard with Public Works Center Code 600 and NAVSHIPYD Code 308 via the Contracting Officer. Furnish the:

a. Contract title and number

b. Specific location of work

c. Reason for work

d. Duration of work

1.4.6.1 Shipyard Hazardous Areas

Do not enter into work areas where Shipyard personnel are using protective

equipment such as respirator and masks or marked boundary areas without prior approval.

1.4.7 RESTRICTIONS ON USE OF YELLOW, ORANGE-YELLOW, RED, AND MAGENTA MATERIALS

The use of yellow, yellow-orange, red and magenta materials for the following purposes is prohibited: sheeting, tarpaulins, polyethylene bottles or other containers, tapes, bags, banding of identification marks on tools, and boundary markers such as ribbons. Obtain Contracting Officer's prior approval for use of such colored materials for other purposes, such as buried vapor barrier membranes.

1.5 SECURITY REQUIREMENTS

1.5.1 Employment Restrictions For NAVFAC PAC

For projects in the Shipyard Controlled Industrial Area (CIA) and Sensitive Areas see "EXTRAORDINARY SECURITY REQUIREMENTS FOR PEARL HARBOR."

The Contractor must not employ any person, for any work required by this contract, who: (1)is a non-immigrant as described in section 101(a)(15)(H)(ii) of the Immigration and Nationality Act (8 U.S.C. 1101(a)(15)(H)(ii), (2) is an alien having a residence in a foreign country which he has no intention of abandoning and who is coming to the United States to perform temporary services or labor.

1.5.2 Personnel List

Submit for approval, at least 15 days prior to the desired date of entry, an original alphabetical list of personnel who require entry into Government property to perform work on the project. Furnish for each person:

a. Name

b. Date and place of birth

c. Citizenship

d. Home address

e. Social security number

f. Current pass expiration date

g. Naturalization or Alien Registration number

h. Passport number, place of issue, and expiration date

1.5.2.1 Citizenship Requirements

Aliens will not be admitted to the work site without approval.Aliens are not allowed on the project site. Work under this contract is restricted to U.S. citizens.

1.5.2.2 Documents Acceptable for Proof of Citizenship

a. Birth registration card

b. Certificate of live birth, birth certificate

c. Certificate of Naturalization

d. Certificate of registration

e. DD-214 (Must Cite Birthplace)

f. DD Form 4 (Contract for Enlistment and Must Cite Birthplace)

g. DD 1966 (Application for Enlistment)

h. Military discharge papers (must cite birthplace)

i. Delayed birth certificate

j. Hawaii certificate of foreign birth

k. Hospital birth certificate

l. Marriage license certificate

m. Merchant marine certificate

n. Military officer ID card

o. Notification of birth registration

p. State of Hawaii ID card

q. USA passport

r. Verbal inquiry with State of Hawaii Vital Statistics Office

1.5.3 Vehicle List

Submit an original list of vehicles to be utilized at the work site with the following information for each vehicle:

a. Make

b. Year

c. Model

d. License number

e. Registered owner

f. Current NAVBASE Pearl Harbor pass expiration date.

1.5.4 Passes

Submit request for personnel and vehicle passes together. Include the Certificate of Insurance for Contractor and Subcontractor(s) and the Statement of Acknowledgement Form SF 1413 with the submittal. Passes will normally be issued within 21 days.

Obtain a blank vehicle pass from the ROICC Kaneohe office, Building 566, and complete and submit it to the Contracting Officer for processing. Include with the submittal, a Certificate of Insurance for Contractor and Subcontractor(s), the Statement of Acknowledgement Form SF 1413 (for Subcontractors only), a Vehicle List, and a Personnel List with Citizenship. Passes will normally be issued within 21 calendar days.

1.5.4.1 Control

Maintain strict accountability over passes. Immediately report to the source of issue, passes missing or lost and the circumstances. If the Contractor has another active contract or one commencing immediately, employees' names may be transferred from one contract to the other. Final payment will not be effected until employees are transferred to another contract or the records are cleared. Furnish a signed letter, countersigned by the source of issue, stating that passes have been turned in.

1.6 EXTRAORDINARY SECURITY REQUIREMENTS FOR PEARL HARBOR

1.6.1 Shipyard CIA and Sensitive Areas

For PHNSY & IMF projects the Contractor shall follow the memo titled, "Security Requirements Applicable for Pearl Harbor Naval Shipyard & IMF's Controlled Industrial Area, Other Sensitive Areas, Controlled Nuclear Information Areas, and/or Nuclear Work Areas," dated Aug, 2013 or the latest dated edition.

U.S. citizen employees of a foreign owned, controlled, and/or influenced company (including a parent company) for access purposes are considered foreign nationals and special authorization would be required for escorted access to PHNSY & IMF spaces.

Six weeks prior to entry into the CIA, submit a visit request for Pearl Harbor Naval Shipyard form (PHNSY 14ND-SYD-5512/28) to the Contracting Officer. The Visit Request must include certification of U.S. citizenship. Entry into the CIA for those listed on the Visit Request may be authorized under one of the following conditions:

a. Contractors having a DOD Facility Security Clearance and whose employees have a DOD security clearance may be badged for immediate unescorted access into the CIA.

b. Employees and representatives having current Shipyard ID badges authorizing CIA access will be permitted entry into the CIA.

c. Employees not holding a current DOD security clearance or current CIA access badge must establish suitability and eligibility based on a Local Record Check (LRC) prior to being badged for unescorted CIA access. A LRC may take up to 3 weeks to process. Provide a Completed Special Access Determination (NAVSEA 5510/15) (Apr 90) for each employee.

d. For situations other than the above, employees or representatives requiring CIA access may be issued an "Escort Required" ("ER") pass for CIA access under the escort of a cleared individual employed by the activity. Processing of "ER" passes may take up to 5 days.

(1) The initial submittal of Visit Request forms need not be all

inclusive. It may be expanded to meet essential requirements of the Contractor. Each individual added to the list, however, is subject to the same pre-entry screening requirements as outlined above.

(2) Shipyard ID badges will be issued by the Shipyard Pass and Identification Office (Pass and ID Office) located in Building 207 at Eighth Street and Avenue "E."

1.6.2 Vehicle Regulations in the Shipyard CIA

No vehicle will be permitted access to a work site in the CIA without a valid Naval Base vehicle pass and a Shipyard vehicle pass. Naval Base vehicle passes are issued by the Base Security Office located in Building 3455 outside the Nimitz Gate. The Shipyard vehicle passes are issued by the Shipyard Pass and ID Office. Shipyard vehicle passes will not be issued unless a Naval Base vehicle pass has been obtained and proof of vehicle registration to the Contractor's company has been presented to Shipyard Pass and ID. Vehicles are required to conform to Shipyard traffic regulations. The speed limit is 15 mph in the CIA. Outside the CIA, the speed limit is as posted or marked.

1.6.2.1 Shipyard Vehicle Pass

Only those Contractor vehicles meeting the following criteria will be allowed to enter the CIA with the Shipyard vehicle pass:

a. Vehicles must clearly display an authorized company sign or logo.

b. Vehicles must be company or commercial vehicles used to transport heavy equipment or material to the job site or to conduct bona fide and required inspections and surveillance at the job site. Privately-owned vehicles will not be used to transport employees to the job site and will not be allowed in the CIA.

1.6.2.2 Commercial Vehicles

Vehicle passes will be issued to each commercial vehicle that is required for the job, authorizing entry and parking within the CIA. Every vehicle entering the CIA will display the pass on the dashboard or visor (facing outward). The pass will be visible at all times while in the CIA. Parking is limited to those areas that are specifically identified on the pass. If additional passes are required, present adequate justification to the Pass and ID Office via the Contracting Officer.

1.6.2.3 Gates

Vehicles must enter and exit from one of the two 24-hour gates located on Avenue "C" or on Fifth Street.

1.6.3 Parking

Prohibited on any piers and dry dock/waterfront areas. Do not park on or block the marked fire lanes at any time. An exception may be made for vehicles which are part of the equipment needed to do the required work and are attached or connected to the pier or ship; for example, a truck which uses a mounted generator or a vehicle with built-in equipment. For the CIA area, submit a written request for pier parking authorization with justification to the Shipyard Security Officer (Code 1125.2) via the

Contracting Office at least 2 weeks prior to the date parking space is required. To obtain parking permits, limited to five, for Bravo pier side parking, submit a written request with justification to the ROICC. Permits do not include heavy equipment, loading/unloading operations or vehicles with Federal Fire Department (FFD) permission for support of immediate work activities in the fire lane. Permits are issued by the Port Operations Officer. Include with request the license number of the vehicle(s), make, model, year, and size of the vehicle(s) (pickup truck, crane, or forklift), parking location, and purpose and duration.Harbor Operations will monitor dock operations and will have vehicle violators ticketed/towed. For permission to stage construction equipment in or protruding into the Bravo pier fire lanes, contact the FFD, c/o Fire Prevention Chief, pager 473-5199.

1.6.3.1 Parking Locations

Parking for privately-owned vehicles is available in lots "A" and "D" on Avenue "D," located between South Avenue and Eighth Street, and in lot "C" on Sixth Street and Central Avenue.

1.6.4 Vehicle Searches

Vehicles are subject to search while entering, remaining in, or leaving the Shipyard or Naval Base areas. Government material being transported out of the CIA must be covered by a Property Pass (OP-7), issued and signed by the Contracting Officer. Material found without a Property Pass will be confiscated and a police offense report issued.

1.6.5 Authorization of Entry

Coordinate entry into shop/office/ship spaces with respective Shop Superintendent/Office Head/Ship's Commanding Officer via the Contracting Officer.

1.6.6 Escort

For entrance to and work inside any building inside the CIA, contact the cognizant Shipyard code for escort services in the affected area.

1.6.7 Government Guard Services

The Shipyard Security Officer (SSO) will provide guard services on a reimbursable basis for work on CIA perimeter fence job sites. Notify and obtain approval from the SSO via the Contracting Office at least 48 hours prior to the time guard services will be required. Submit in writing the purpose and number of hours guard services will be required. Any work on the CIA fence must be completed by the end of the work day or the openings resulting from that work must be closed to prevent unauthorized access.

1.6.8 Areas Not Covered by Contract

Contractor personnel will not be permitted to enter Shipyard buildings, spaces, and areas not covered by this contract except on prior approval of the Shipyard department/office/shop having jurisdiction of the areas. Coordinate action with the Contracting Officer to obtain such entry approval.

1.6.9 Access to Unclassified Information

Access to unclassified U.S. Navy shipbuilding, conversion, or repair

technology and related technical information manuals, documents, drawings, plans, specifications, and other unclassified information is restricted to official need-to-know basis, designated by physical markings to show the appropriate control designations. Handle, control, and safeguard to prevent oral, visual, and documentary disclosure to the public, to foreign sources, and to personnel not having an official need-to-know. Return this information to the Pearl Harbor Naval Shipyard upon completion of contracted work, except when specific retention authorization is granted by the Contracting Officer.

1.6.10 Photographs

Photography is prohibited in the Pearl Harbor Naval Shipyard. When operationally required, submit a written request containing specific justification and details to the Video Production Center (Code 103) via review by the Security Officer prior to release.

1.6.11 Contractor Regulations

Comply with the following conditions:

a. Submit a Visit Request (VR) and Special Access Determination (SAD) for each person listed to the Security Officer (Code 1125.2) via the Contracting Officer at least 6 weeks prior to the start date.

b. Employees and representatives requiring access are U.S. citizens or U.S. nationals.

c. Under no circumstances must personnel hand-carry their own visit request.

d. Employees must provide documented proof of U.S. citizenship to the Pass and ID Office prior to being issued a Shipyard badge.

e. Employees must be available for interviews upon request by the Shipyard Personnel Security Specialist.

f. Employees' representatives must attend a 15-minute orientation on the safety, security, and radiological protection aspects of industrial operations within the Shipyard. The briefing, in the form of a video tape presentation, will be given at the Pass and ID Office in groups of 10, prior to the issuance of Shipyard badges or passes. Special arrangements for larger groups can be arranged on request.

g. Employees must wear and display the Shipyard badge in the chest area at all times while entering, remaining in, and exiting Shipyard spaces and each badge must be used only by the specific individual named on the badge.

h. Vehicles in Shipyard areas must display a valid Naval Base vehicle pass and must have company's name on both sides of any vehicle that enters the CIA.

i. Maintain strict accountability over identification badges and passes issued by the Pass and ID office. Immediately report to the Pass and ID Office, any badges/passes missing or lost and the circumstances. Return badges/passes to the Contracting Officer immediately upon termination of any employee, expiration, completion of contract, or when no longer required. The Contracting Officer will ensure that all

badges/passes are returned and forwarded to the Shipyard Pass and ID Office (Code 1125.2).

j. Restrict hours of work to 7:00 a.m. - 3:30 p.m. Monday through Friday, work days only. When operational needs require scheduling of work after 3:30 p.m. (Monday through Friday) or on weekends and holidays, provide written notification at least 2 weeks in advance to the Contracting Officer who will obtain approval from the respective Shipyard departments, offices, and shops. Such notifications will include specific dates, hours of work, location of work, type of work to be performed, contract number and project title. The Contracting Officer will provide a copy of the notification to the Security Officer along with written notification that work, as scheduled, has been approved by the respective department, office, or shop concerned.

k. Restrict employees/representatives to the work site and control travel directly to and from the work site.

l. Ensure that yellow plastic material is not used for warning signs, covering materials, etc.

m. Restore all traffic/parking/security signs and markings, including space numbers, designations, and lines, to their original form if such signs/markings are defaced or deleted during construction/repair.

n. Be responsible for control and security of Contractor-owned equipment and materials at the work site. Report immediately, missing/lost/stolen property to the Naval Base Police Department (phone 474-1237) as each case occurs.

o. Ensure that no material is stacked within 10 feet of the CIA perimeter. Remove from the work site, or secure ladders or other such equipment which could be used to climb the CIA perimeter fence. Ensure that no vehicles are parked within 10 feet of the CIA perimeter.

p. Provide written notification to the Commander, Pearl Harbor Naval Shipyard via the Contracting Officer 2 weeks prior to actual start of work to allow for notification of the appropriate Shipyard departments, offices, and shops of the impact resulting from the contract work. Such notifications will include specific details such as work schedules (including actual start date for Shipyard entry) and impact.

q. Ensure that no openings in the roof/walls/windows/fence of the building exist at the end of the work day and do not exist where penetration is possible during non-working hours. If the building cannot be secured at the end of the work day, coordinate action with the Contracting Office to notify the cognizant code to arrange for a security watch by their personnel.

r. Seventy-two hours prior to making any penetrations (such as tunneling under, cutting through a fence or building) in a restricted area, contact Code 1125.2 to make arrangements for a security guard or other measures required to meet all security requirements. Cost of security guard will be charged to the Contractor.

1.6.12 Other Sensitive Areas

1.6.12.1 Extraordinary Security Requirements

The Contract Clause entitled "Identification of Employees" and the following apply:

a. Vehicle searches. All construction vehicles will be searched by the Marine sentry.

b. Photographs. Photographs are prohibited in and around the building unless a written request containing specific justification and details is approved by the security officer via the Contracting Officer. Four days' advance notice is required. Photographs, when approved, must only be taken in the presence of an activity escort.

c. Personnel restrictions. Due to sensitivity of building operations, the following apply:

(1) Restrict personnel to the designated work site.

(2) Contractor's movements within the building will be restricted. Contractor personnel will be escorted to and from designated work areas. Contractor personnel are not permitted outside of designated work areas without being escorted by authorized personnel. Submit requests for entry into the building 4 days in advance with information required by paragraph entitled "Personnel List" for submission to the "Division Project Officer" through the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 20 00.00 20

PRICE AND PAYMENT PROCEDURES
11/11

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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP-1110-1-8	(2009) Construction Equipment Ownership and Operating Expense Schedule

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Earned Value Report; G

1.3 EARNED VALUE REPORT

1.3.1 Data Required

This contract requires the use of a cost-loaded Network Analysis Schedule (NAS). The information required for the Schedule of Prices will be entered as an integral part of the Network Analysis Schedule. Within 15 calendar days of notice of award, prepare and deliver to the Contracting Officer an Earned Value Report (construction contract) as directed by the Contracting Officer. Provide a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, and extended prices. Costs shall be summarized and totals provided for each construction category.

1.3.2 Schedule Instructions

Payments will not be made until the Earned Value Report from the cost-loaded NAS has been submitted to and accepted by the Contracting Officer. Identify the cost for site work, and include incidental work to the 5 ft line. Identify costs for the building(s), and include work out to the 5 ft line. Work out to the 5 ft line shall include construction encompassed within a theoretical line 5 ft from the face of exterior walls and shall include attendant construction, such as pad mounted HVAC cooling equipment, cooling towers, and transformers placed beyond the 5 ft line.

1.3.3 Real Property Assets

The Government will provide the Draft DD Form 1354, Transfer and Acceptance of Military Real Property filled in with the appropriate Real Property

Unique Identifiers (RPUID) and related construction Category Codes to summarize the designed real property assets that apply to this contract. The Contractor shall meet with the Contracting Officer and the Real Property Accounting Officer during the Pre Construction Meeting and the Project Closeout Meetings to modify and include any necessary changes to the DD Form 1354. The Contractor shall provide the Interim DD Form 1354 that uses the appropriate division of the RPUIDs/ Category Codes to represent the final constructed facility and include all associated cost. Coordinate the Contractor's Price and Payment structure with the structure of the RPUIDs/ Category Codes.

Divide detailed asset breakdown into the RPUIDs and related construction Category Codes and populate associated costs which represent all aspects of the work. Where assets diverge into multiple RPUID/ Category Codes, divide the asset and provide the proportion of the assets in each RPUID/ Category Code. Assets and related RPUID/ Category Codes may be modified by the Contracting Officer as necessary during course of the work. Coordinate identification and proportion of these assets with the Government Real Property Accounting Officer.

Cost data accumulated under this section are required in the preparation of DD Form 1354.

1.3.4 Schedule Requirements for HVAC TAB

The field work Section 23 05 93 TESTING, ADJUSTING AND BALANCING shall be broken down in the Earned Value Report from the cost-loaded NAS by separate line items which reflect measurable deliverables. Specific payment percentages for each line item shall be determined on a case by case basis for each contract. The line items shall be as follows:

a. Approval of Design Review Report: The TABS Agency is required to conduct a review of the project plans and specifications to identify any feature, or the lack thereof, that would preclude successful testing and balancing of the project HVAC systems. The resulting findings shall be submitted to the Government to allow correction of the design. The progress payment shall be issued after review and approval of the report.

b. Approval of the pre-field engineering report: The TABS Agency submits a report which outlines the scope of field work. The report shall contain details of what systems will be tested, procedures to be used, sample report forms for reporting test results and a quality control checklist of work items that must be completed before TABS field work commences.

c. Season I field work: Incremental payments are issued as the TABS field work progresses. The TABS Agency mobilizes to the project site and executes the field work as outlined in the pre-field engineering report. The HVAC water and air systems are balanced and operational data shall be collected for one seasonal condition (either summer or winter depending on project timing).

d. Approval of Season I report: On completion of the Season I field work, the data is compiled into a report and submitted to the Government. The report is reviewed, and approved, after ensuring compliance with the pre-field engineering report scope of work.

e. Completion of Season I field QA check: Contract QC and Government

representatives meet the TABS Agency at the jobsite to retest portions of the systems reported in the Season I report. The purpose of these tests are to validate the accuracy and completeness of the previously submitted Season I report.

f. Approval of Season II report: The TABS Agency completes all Season II field work, which is normally comprised mainly of taking heat transfer temperature readings, in the season opposite of that under which Season I performance data was compiled. This data shall be compiled into a report and submitted to the Government. On completion of submittal review to ensure compliance with the pre-field engineering report scope, progress payment is issued. Progress payment is less than that issued for the Season I report since most of the water and air balancing work effort is completed under Season I.

1.4 CONTRACT MODIFICATIONS

In conjunction with the Contract Clause "DFARS 252.236-7000, Modification Proposals-Price Breakdown," and where actual ownership and operating costs of construction equipment cannot be determined from Contractor accounting records, equipment use rates shall be based upon the applicable provisions of the EP-1110-1-8.

1.5 CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT

1.5.1 Content of Invoice

Requests for payment will be processed in accordance with the Contract Clause FAR 52.232-27, Prompt Payment Construction Contracts and FAR 52.232-5, Payments Under Fixed-Price Construction Contracts. The requests for payment shall include the documents listed below.

a. The Contractor's invoice, on NAVFAC Form 7300/30 furnished by the Government, showing in summary form, the basis for arriving at the amount of the invoice. Form 7300/30 shall include certification by Quality Control (QC) Manager as required by the contract.

b. The Earned Value Report from the cost-loaded NAS, showing in detail: the estimated cost, percentage of completion, and value of completed performance for each of the construction categories stated in this contract.

c. Updated Project Schedule and reports required by the contract.

d. Contractor Safety Self Evaluation Checklist.

e. Other supporting documents as requested.

f. Updated copy of submittal register.

g. Invoices not completed in accordance with contract requirements will be returned to the Contractor for correction of the deficiencies.

1.5.2 Submission of Invoices

If NFAS Clause 5252.232-9301 is included in the contract, the documents listed in paragraph "CONTENT OF INVOICE" shall be provided in their entirety as attachments in Wide Area Work Flow (WAWF) for each invoice submitted. The maximum size of each WAWF attachment is two megabytes, but

there are no limits on the number of attachments. If a document cannot be attached in WAWF due to system or size restriction it shall be provided as instructed by the Contracting Officer.

1.5.3 Final Invoice

a. A final invoice shall be accompanied by the certification required by DFARS 252.247.7023 TRANSPORTATION OF SUPPLIES BY SEA, and the Contractor's Final Release. If the Contractor is incorporated, the Final Release shall contain the corporate seal. An officer of the corporation shall sign and the corporate secretary shall certify the Final Release.

b. For final invoices being submitted via WAWF, the original Contractor's Final Release Form and required certification of Transportation of Supplies by Sea must be provided directly to the respective Contracting Officer prior to submission of the final invoice. Once receipt of the original Final Release Form and required certification of Transportation of Supplies by Sea has been confirmed by the Contracting Officer, the Contractor shall then submit final invoice and attach a copy of the Final Release Form and required certification of Transportation of Supplies by Sea in WAWF.

c. Final invoices not accompanied by the Contractor's Final Release and required certification of Transportation of Supplies by Sea will be considered incomplete and will be returned to the Contractor.

1.6 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests by the Contractor which comply with the requirements of this section, and will be subject to reduction for overpayments or increase for underpayments made on previous payments to the Contractor.

1.6.1 Obligation of Government Payments

The obligation of the Government to make payments required under the provisions of this contract will, at the discretion of the Contracting Officer, be subject to reductions and/or suspensions permitted under the FAR and agency regulations including the following in accordance with "FAR 32.503-6:

a. Reasonable deductions due to defects in material or workmanship;

b. Claims which the Government may have against the Contractor under or in connection with this contract;

c. Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor; and

d. Failure to provide up to date record drawings not current as stated in Contract Clause "FAC 5252.236-9310, Record Drawings."

1.6.2 Payment for Onsite and Offsite Materials

Progress payments may be made to the contractor for materials delivered on the site, for materials stored off construction sites, or materials that are in transit to the construction sites under the following conditions:

a. FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts.

b. Materials delivered on the site but not installed, including completed preparatory work, and off-site materials to be considered for progress payment shall be major high cost, long lead, special order, or specialty items, not susceptible to deterioration or physical damage in storage or in transit to the construction site. Examples of materials acceptable for payment consideration include, but are not limited to, structural steel, non-magnetic steel, non-magnetic aggregate, equipment, machinery, large pipe and fittings,precast/prestressed concrete products, plastic lumber (e.g., fender piles/curbs), and high-voltage electrical cable. Materials not acceptable for payment include consumable materials such as nails, fasteners, conduits, gypsum board, glass, insulation, and wall coverings.

c. Materials to be considered for progress payment prior to installation shall be specifically and separately identified in the Contractor's estimates of work submitted for the Contracting Officer's approval in accordance with Earned Value Report requirement of this contract. Requests for progress payment consideration for such items shall be supported by documents establishing their value and that the title requirements of the clause at FAR 52.232-5 have been met.

d. Materials are adequately insured and protected from theft and exposure.

e. Provide a written consent from the surety company with each payment request for offsite materials.

f. Materials to be considered for progress payments prior to installation shall be stored either in Hawaii, Guam, Puerto Rico, or the Continental United States. Other locations are subject to written approval by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS
08/15

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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

View Location Map; G

Progress and Completion Pictures; G

1.3 VIEW LOCATION MAP

Submit, prior to or with the first digital photograph submittals, a sketch or drawing indicating the required photographic locations. Update as required if the locations are moved.

1.4 PROGRESS AND COMPLETION PICTURES

Photographically document site conditions prior to start of construction operations. Provide monthly, and within one month of the completion of work, digital photographs, 1600x1200x24 bit true color 5 megapixel minimum resolution in JPEG file format showing the sequence and progress of work. Take a minimum of 20 digital photographs each week throughout the entire project from a minimum of ten views from points located by the Contracting Officer. Submit with the monthly invoice two sets of digital photographs, each set on a separate compact disc (CD) or data versatile disc (DVD), cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Provide photographs for each month in a separate monthly directory and name each file to indicate its location on the view location sketch. Also provide the view location sketch on the CD or DVD as a digital file. Include a date designator in file names. Cross reference submittals in the appropriate daily report. Photographs provided are for unrestricted use by the Government.

1.5 MINIMUM INSURANCE REQUIREMENTS

Provide the minimum insurance coverage required by FAR 28.307-2 LIABILITY, during the entire period of performance under this contract. Provide other insurance coverage as required by State of Hawaii law.

1.6 FIRST TIER CONTRACTOR REQUIREMENTS FOR ASBESTOS CONTAINING MATERIALS

Accomplish all contract requirements of Section 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS, assigned to the Private Qualified Person, directly with a first tier subcontractor.

1.7 SUPERVISION

1.7.1 Minimum Communication Requirements

Have at least one qualified superintendent, or competent alternate, capable of reading, writing, and conversing fluently in the English language, on the job-site at all times during the performance of contract work. In addition, if a Quality Control (QC) representative is required on the contract, then that individual must also have fluent English communication skills.

1.7.2 Superintendent Qualifications

The project superintendent must have a minimum of 10 years experience in construction with at least 5 of those years as a superintendent on projects similar in size and complexity. The individual must be familiar with the requirements of EM 385-1-1 and have experience in the areas of hazard identification and safety compliance. The individual must be capable of interpreting a critical path schedule and construction drawings. The qualification requirements for the alternate superintendent are the same as for the project superintendent. The Contracting Officer may request proof of the superintendent's qualifications at any point in the project if the performance of the superintendent is in question.

For routine projects where the superintendent is permitted to also serve as the Quality Control (QC) Manager as established in Section 01 45 00.00 20 QUALITY CONTROL, the superintendent must have qualifications in accordance with that section.

1.7.2.1 Duties

The project superintendent is primarily responsible for managing and coordinating day-to-day production and schedule adherence on the project. The superintendent is required to attend NAVFAC Red Zone meetings, partnering meetings, and quality control meetings. The superintendent or qualified alternative must be on-site at all times during the performance of this contract until the work is completed and accepted.

1.7.3 Non-Compliance Actions

The Project Superintendent is subject to removal by the Contracting Officer for non-compliance with requirements specified in the contract and for failure to manage the project to insure timely completion. Furthermore, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders is acceptable as the subject of claim for extension of time for excess costs or damages by the Contractor.

1.8 PRECONSTRUCTION MEETING

After award of the contract but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule of prices or earned value report, shop drawings, and other submittals, scheduling programming, prosecution of the work, and clear expectations of the "Interim DD Form 1354" Submittal. Major subcontractors who will engage in the work must also attend.

1.9 FACILITY TURNOVER PLANNING MEETINGS (NAVFAC Red Zone - NRZ)

Meet with the Government to identify strategies to ensure the project is carried to expeditious closure and turnover to the Client. Start the turnover process at the Pre-Construction Conference meeting with a discussion of the NAVFAC Red Zone (NRZ) process and convene at regularly scheduled NRZ Meetings. Include the following in the facility Turnover effort:

1.9.1 NRZ Checklist

a. Contracting Officer's Technical Representative (COTR) will provide the Contractor a copy of the NRZ Checklist template prior to 75 percent completion.

b. Prior to 75 percent completion add/delete critical activities to the NRZ Checklist template as necessary to match the project scope, and schedule critical activities and insert planned completion dates in the NRZ checklist for each critical activity. Present the NRZ Checklist to COTR and review during a regularly scheduled QC Meeting.

1.9.2 Meetings

a. Upon Government acceptance of the NRZ Checklist, the Project Superintendent is required to lead regular NRZ Meetings beginning at approximately 75 percent project completion, or three to six months prior to Beneficial Occupancy Date (BOD), whichever comes first.

b. The Contracting Officer will determine the frequency of the meetings, which is expected to increase as the project completion draws nearer.

c. Using the NRZ Checklist as a Plan of Action and Milestones (POAM) and basis for discussion, review upcoming critical activities and strategies to ensure work is completed on time.

d. Coordinate with the COTR any upcoming activities that require Government involvement.

e. Maintain the NRZ Checklist by documenting the actual completion dates as work is completed and update the NRZ Checklist with revised planned completion dates as necessary to match progress. Distribute copies of the current NRZ Checklist to attendees at each NRZ Meeting.

1.10 PARTNERING

To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership within the Project Team whose members

are from the Government, the Contractor and their Subcontractors. Key personnel from the Supported Command, the End User (who will occupy the facility), the Government Design and Construction team and Subject Matter Experts, the Installation, the Contractor and Subcontractors, and the Designer of Record will be invited to participate in the Partnering process. The Partnership will draw on the strength of each organization in an effort to achieve a project that is without any safety mishaps, conforms to the Contract, and stays within budget and on schedule.

The Contracting Officer will provide Information on the Partnering Process and a list of key and optional personnel who should attend the Partnering meeting.

1.10.1 Formal Partnering

Provide and host the Partnering sessions with key personnel of the Project Team, including Contractor personnel and Government personnel. Pay all costs associated with the Partnering effort including the Facilitator, the meeting room, and other incidental items. In exception, each participant bears their own costs for meals, lodging, and transportation associated with the Partnering sessions.

Before a Partnering session, coordinate with the Facilitator all requirements for incidental items (such as audio-visual equipment, easels, flipchart paper, colored markers, note paper, pens/pencils, colored flash cards), and have these items available at the Partnering session. Provide copies of documents for distribution to all attendees. Provide a Facilitator experienced in conducting Partnering Workshops, and who is acceptable to both the Government and the Contractor. The Facilitator is responsible for leading the team in a timely manner and making sure that issues are identified and resolved. A list of Partnering Facilitators is available from the Contracting Officer.

a. Schedule the Initial Partnering Session for a duration of half day minimum. Locate this session at a place off the construction site, as agreed to by the Contracting Officer and the Contractor. It may take place concurrently with the Pre-Construction Meeting.

b. Schedule follow-on Partnering Session(s) for a maximum of 4 hours. Schedule them at no more than 3 to six month intervals. Participants are encouraged to utilize electronic means to expedite meetings. Meetings may be held at a location off-Base, at the project site, or in a Government Facility on Base. Follow-on meetings may be held concurrently with other scheduled meetings. Attendees need only be those required to resolve current issues. Recommend using the same Facilitator from the Initial Partnering session to achieve best results and for continuity.

1.10.2 Informal Partnering

The Contracting Officer will organize the Partnering Sessions with key personnel of the project team, including Contractor personnel and Government personnel.

The Initial Partnering session should be a part of the Pre-Construction Meeting. Partnering sessions will be held at a location agreed to by the Contracting Officer and the Contractor (typically a conference room provided by the PWD FEAD/ROICC office or the Contractor). The Initial Informal Partnering Session will be conducted and facilitated using

electronic media (a video and accompanying forms) provided by the Contracting Officer. The Partners will determine the frequency of the follow-on sessions, at no more than 3 to six month intervals.

1.11 ELECTRONIC MAIL (E-MAIL) ADDRESS

Establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments as text files, pdf files, and other similar formats. Within 10 days after contract award, provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contracting Officer related to this contract including, but not limited to contract documents, invoice information, request for proposals, and other correspondence. The Contracting Officer may also use email to notify the Contractor of base access conditions when emergency conditions warrant, such as hurricanes or terrorist threats. Multiple email addresses are not allowed.

It is the Contractor's responsibility to make timely distribution of all Contracting Officer initiated e-mail with its own organization including field office(s). Promptly notify the Contracting Officer, in writing, of any changes to this email address.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 32 17.00 20

COST-LOADED NETWORK ANALYSIS SCHEDULES (NAS)
02/15

PART 1 GENERAL

1.1 DESCRIPTION

The Contractor is responsible for scheduling procurement, Contractor quality control and construction, acceptance testing and training. Refer to Specification Section 01 33 00 SUBMITTAL PROCEDURES to determine if any items require Government approval prior to construction; if any are required, include that submittal review time in the schedule.

The schedule is a tool to manage the project, both for Contractor and Government activities. It will also be used to report progress and evaluate time extensions. The Project NAS must be cost-loaded and will provide the basis for progress payments. Use the Critical Path Method (CPM) and the Precedence Diagram Method (PDM) to satisfy time and cost applications. For consistency, when scheduling software terminology is used in this specification, the terms in Primavera's scheduling programs are used.

1.2 SUBMITTALS

The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Qualifications; G

Baseline Network Analysis Schedule (NAS); G

SD-07 Certificates

Monthly Network Analysis Schedule Update; G

SD-11 Closeout Submittals

As-Built Schedule; G

1.3 SCHEDULE ACCEPTANCE PRIOR TO START OF WORK

Participate with the Contracting Officer in a preliminary meeting(s) to discuss the proposed schedule and requirements of this section prior to the Contractor preparing the Project Baseline Schedule. Government review comments on the Contractor's schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents. Only bonds may be paid prior to acceptance of the Baseline Network Analysis Schedule (NAS) The acceptance of a Baseline NAS is a condition precedent to:

a. The Contractor starting work on the demolition or construction stage(s) of the contract.

b. Processing Contractor's invoices(s) for construction activities/items

of work.

c. Review of any schedule updates.

Submittal of the Baseline Network Analysis Schedule, and subsequent schedule updates, is understood to be the Contractor's certification that the submitted schedule meets all of the requirements of the Contract Documents, represents the Contractor's plan on how the work will be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

1.4 SOFTWARE

Prepare and maintain project schedules using Primavera P6. Importing data into P6 using data conversion techniques or third party software is cause for rejection of the submitted schedule.

A listing of Primavera P6 settings and parameters which must be used in preparing the Schedules are contained later in this specification section. Deviation from these settings and parameters, without prior consent of the Contracting Officer, is cause for rejection of schedule submission.

1.5 QUALIFICATIONS

The designated Scheduler for the project must have prepared and maintained at least 3 previous schedules of similar size and complexity of this contract using Primavera P6. At least one of the three must be in Primavera P6. Submit a resume outlining the qualifications of the Scheduler. Payment will not be processed until an acceptable Scheduler is provided.

1.6 NETWORK SYSTEM FORMAT

The system must include time-scaled logic diagrams and specified reports.

1.6.1 Diagrams

Provide Time-scaled Logic Diagram printed in color on ANSI D size sheets. The diagram must clearly show activities on the critical path. Include the following information for each activity:

a. Activity ID

b. Activity Description

c. Original Duration in Work Days

d. Remaining duration in Work Days

e. Physical Percent Complete

f. Start Date

g. Finish Date

h. Total Float

1.6.2 Schedule Activity Properties and Level of Detail

The NAS must identify all Government, Construction Quality Management (CQM), Construction activities planned for the project and all other activities that could impact project completion if delayed. Create separate activities for each Phase, Area, Floor Level and Location the activity is occurring. Activity categories included in the schedule are specified below.

With the exception of the Contract Award and Contract Completion Date (CCD) milestone activities, no activity shall be open-ended; each activity must have predecessor and successor ties. No activity must have open start or open finish (dangling) logic. Minimize redundant logic ties. Once an activity exists on the schedule it must not be deleted or renamed to change the scope of the activity and must not be removed from the schedule logic without approval from the Contracting Officer. While an activity cannot be deleted, where said activity is no longer applicable to the schedule but must remain within the logic stream for historical record, it can be changed to a milestone. Document any such change in the milestone's "Notebook", including a date and explanation for the change. The ID number for a deleted activity must not be re-used for another activity. Within the Baseline Schedule no more than 20 percent of the activities shall be critical or near critical. Critical is defined as having zero days of Total Float. "Near Critical" is defined as having Total Float of 1 to 14 days. Contractor activities must be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days.

1.6.2.1 Activity Categories

1.6.2.1.1 Procurement Activities

Examples of procurement activities include, but are not limited to; Material/equipment submittal preparation, submittal and approval of material/equipment; material/equipment fabrication and delivery, and material/equipment on-site. As a minimum, separate procurement activities will be provided for critical items, long lead items, items requiring Government approval and material/equipment procurement for which payment will be requested in advance of installation. Show each delivery with relationship tie to the Construction Activity specifically for the delivery.

1.6.2.1.2 Government Activities

Government and other agency activities that could impact progress must be clearly identified. Government activities include, but are not limited to; Government approved submittal reviews, Government conducted inspections/tests, environmental permit approvals by State regulators, utility outages, and delivery of Government Furnished Material/Equipment.

1.6.2.1.3 Quality Management (QM) Activities

The Preparatory Phase and Initial Phase for each Definable Feature of Work identified in the Contractor's Quality Control Plan must be added to each Three-Week Look Ahead Schedule referenced in the paragraph THREE-WEEK LOOK AHEAD SCHEDULE. The Follow-up Phase will be represented by the Construction Activities in the Baseline Schedule and in the schedule updates.

1.6.2.1.4 Construction Activities

No on-site construction activity may have a duration in excess of 20 working days. Contractor activities must be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days, unless otherwise defined in this contract.

1.6.2.1.5 Turnover and Closeout Activities

Include activities with all items on the NAVFAC Red Zone Checklist/POAM that are applicable to this project. As a minimum, include all testing, specialized inspection activities, Pre-Final Inspection, Punch List Completion, Final Inspection and Acceptance. Add a milestone for the Facility Turnover Planning Meeting at approximately 75 percent construction contract completion or three to six months prior to Contract Completion Date (CCD), whichever is sooner.

1.6.2.2 Contract Milestones and Constraints

1.6.2.2.1 Project Start Date Milestones

Include as the first activity on the schedule a start milestone titled "Contract Award", which must have a Mandatory Start constraint equal to the Contract Award Date.

1.6.2.2.2 Facility Turnover Planning Meeting Milestones

See paragraph ACTIVITY CATEGORIES above.

1.6.2.2.3 Substantial Completion Milestone

Include an unconstrained finish milestone on the schedule titled "Substantial Completion". Substantial Completion is defined as the point in time the Government would consider the project ready for beneficial occupancy wherein by mutual agreement of the Government and Contractor, Government use of the facility is allowed while construction access continues in order to complete remaining items (e.g. punch list and other close out submittals).

1.6.2.2.4 Projected Completion Milestone

Include an unconstrained finish milestone on the schedule titled "Projected Completion". Projected Completion is defined as the point in time the Government would consider the project complete. This milestone must have the Contract Completion (CCD) milestone as its only successor.

1.6.2.2.5 Contract Completion Date (CCD) Milestone

Include as the last activity on the schedule a finish milestone titled "Contract Completion (CCD)". Calculation of schedule updates must be such that if the finish of the "Projected Completion" milestone falls after the contract completion date, then negative float will be calculated on the longest path and if the finish of the "Projected Completion" milestone falls before the contract completion date, the float calculation must reflect positive float on the longest path.

1.6.2.3 Work Breakdown Structure & Activity Code

At a minimum, the Contractor must establish a Work Breakdown Structure

(WBS) and provide activity codes identified as follows:

1.6.2.3.1 Work Breakdown Structure (WBS)

Group all activities and milestones within appropriate WBS categories including, at a minimum, the following:

a. Project Milestones:

(1) Management Milestones

(2) Project Administrative Meetings

b. Pre-Construction Phase:

(1) Submittals and Reviews

(2) Procurement

c. Construction Phase; Create multiple sub-sections in accordance with project specific categories of work including in WBS descending order as follows:

(1) General Area

(a) Type of Work Item

1. Location

d. Commissioning & Testing:

(1) Specific area/locations of commissioning

(2) Final Testing

(3) Training

e. Project Closeout: Include activity items such as Punchlist, Demobilization, O&M, As-built Drawings, and As-built NAS.

f. Modifications: Create multiple sub-sections as the project progresses identified by modifications issued.

1.6.2.3.2 Responsibility Code

All activities in the project schedule must be identified with the party responsible for completing the task. Activities must not belong to more than one responsible party.

1.6.2.3.3 Construction Specification Institute (CSI) Masterformat Code

Identify all activities in the project schedule with its respective Specification Section number. Activities must not belong to more than one Section number. If an activity does not have an applicable CSI Code (e.g. Mobilize), the code must be "0000".

1.6.2.4 Anticipated Weather Lost Work Days

Use the following schedule of anticipated monthly non-work days due to

adverse weather as the basis for establishing a "Weather Calendar" showing the number of anticipated non-workdays for each month due to adverse weather, in addition to Saturdays, Sundays and all Federal Holidays as non-work days.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS (Joint Base Pearl Harbor Hickam)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3	2	2	0	0	0	0	0	0	1	2	3

MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS (MCBH Kaneohe Bay, Oahu)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	3	3	3	2	0	1	1	1	2	4	4

MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS (NCTAMS PAC Wahiawa, Oahu)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
6	3	4	3	1	0	1	0	1	2	3	3

MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS (PMRF Barking Sands, Kauai)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3	2	2	1	1	0	0	0	0	2	3	3

Assign the Weather Calendar to any activity that could be impacted by adverse weather. The Contracting Officer will issue a modification in accordance with the contract clauses, giving the Contractor a time extension for the difference of days between the anticipated and actual adverse weather delay if the number of actual adverse weather delay days exceeds the number of days anticipated for the month in which the delay occurs and the adverse weather delayed activities are critical to contract completion. A lost workday due to weather conditions is defined as a day in which the Contractor cannot work at least 50 percent of the day on the impacted activity.

1.6.2.5 Anticipated Restricted Delays

Unless otherwise noted or defined in Section 01 14 00 WORK RESTRICTIONS, allow in the schedule a total of 5 lost workdays per calendar year for instances where base access is not permitted due to a restriction or closure which causes a delay in the work. A lost workday is defined as a day which the Contractor cannot work at least 50 percent of the day on the closed installation. If the installation is closed for a period longer than 5 lost workdays per calendar year, the Contracting Officer will issue a no cost contract modification as applicable in accordance with the contract clauses extending the contract completion date where the critical path has been impacted.

1.6.2.6 Cost Loading

1.6.2.6.1 Cost Loading Activities

Assign Material and Equipment Costs, for which payment will be requested in advance of installation, to their respective procurement activity (i.e., the material/equipment on-site activity). Assign cost for material/equipment, paid for after installation; labor; and construction equipment to their respective Construction Activities. The value of commissioning, testing and closeout WBS section may not be less than 10 percent of the total costs for Procurement and Construction Activities. Evenly disperse overhead and profit to each activity over the duration of the project.

1.6.2.6.2 Quantities and Units of Measure

Each cost loaded activity must have a detailed quantity breakdown and unit of measure. Lump sum costing is not acceptable.

1.6.3 Schedule Software Settings and Restrictions

a. Activity Constraints: Date/time constraint(s), other than those required by the contract, are not allowed unless accepted by the Contracting Officer. Identify any constraints proposed and provide an explanation for the purpose of the constraint in the Narrative Report as described in paragraph REQUIRED TABULAR REPORTS.

b. Default Progress Data Disallowed: Actual Start and Actual Finish dates on the CPM schedule must match the dates on the Contractor Quality Control and Production Reports.

c. Software Settings: Handle schedule calculations and Out-of-Sequence progress (if applicable) through Retained Logic, not Progress Override. Show all activity durations and float values in days. Show activity progress using Remaining Duration. Set default activity type to "Task Dependent".

d. At a minimum, include the following settings and parameters in Baseline Schedule preparation:

(1) General: Define or establish Calendars and Activity Codes at the "Project" level, not the "Global" level.

(2) Admin Drop-Down Menu, Admin Preferences, Time Periods Tab:

(a) Set time periods for P6 to 8.0 Hours/Day, 40.0 Hours/Week, 172.0 Hours/Month and 2000.0 Hours/Year.

(b) Use assigned calendar to specify the number of work hours for each time period: Must be checked.

(3) Admin Drop-Down Menu, Admin Preferences, Earned Value Tab:

(a) Earned Value Calculation: Use "Budgeted values with current dates".

(4) Project Level, Dates Tab:

(a) Set "Must Finish By" date to "Contract Completion Date".

(5) Project Level, Defaults Tab:

(a) Duration Type: Set to "Fixed Duration & Units".

(b) Percent Complete Type: Set to "Physical".

(c) Activity Type: Set to "Task Dependent".

(d) Calendar: Set to "Standard 5 Day Workweek". Calendar must reflect Saturday, Sunday and all Federal holidays as non-work days. Alternative calendars may be used with Contracting Officer approval.

(6) Project Level, Calculations Tab:

(a) Activity percent complete based on activity steps: Must be Checked.

(b) Reset Remaining Duration and Units to Original: Must be Checked.

(c) Subtract Actual from At Completion: Must be Checked.

(d) Recalculate Actual units and Cost when duration percent(%) complete changes: Must be Checked.

(e) Link Actual to Date and Actual This Period Units and Cost: Must be Checked.

(f) Price/Unit: Set to "$1/h".

(g) Update units when costs change on resource assignments: Must be Unchecked.

(7) Project Level, Settings Tab:

(a) Define Critical Activities: Check "Total Float is less than or equal to" and add "0d".

(8) Work Breakdown Structure Level, Earned Value Tab:

(a) Technique for Computing Performance Percent Complete: "Activity percent complete" is selected.

(b) Technique for Computing Estimate to Complete (ETC): "PF = 1" is selected.

1.6.4 Required Tabular Reports

Include the following reports with the Baseline, Monthly Update and any other required schedule submittals:

a. Log Report: Listing of all changes made between the previous schedule and current updated schedule.

b. Narrative Report: Identify and justify:

(1) Progress made in each area of the project;

(2) Critical Path;

(3) Date/time constraint(s), other than those required by the contract

(4) Changes in the following; added or deleted activities, original and remaining durations for activities that have not started, logic, milestones, planned sequence of operations, critical path, and cost loading;

(5) Any decrease in previously reported activity Earned Amount;

(6) Pending items and status thereof, including permits, changes orders, and time extensions;

(7) Status of Contract Completion Date and interim milestones;

(8) Current and anticipated delays (describe cause of delay and corrective actions(s) and mitigation measures to minimize);

(9) Description of current and future schedule problem areas.

Each entry in the narrative report must cite the respective Activity ID and Activity Description, the date and reason for the change, and description of the change.

c. Earned Value Report: List all activities having a budget amount cost loaded. Compile total earnings on the project from notice to proceed to current progress payment request. Show current budget, previous physical percent complete, to-date physical percent complete, previous earned value, to-date earned value and cost to complete on the report for each activity.

d. Schedule Variance Control (SVC) Diagram: With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates and 2) Earned Value to-date. Revise Cash Flow S-Curves when the contract is modified, or as directed by the Contracting Officer.

e. Daily Reported Production Activity: Submit on a monthly basis, in electronic spreadsheet format, a summary of daily reported production activity for the reporting month in the update schedule. Use the following columns for reporting:

(1) Date

(2) Activity ID

(3) Work Description

(4) Contractor

(5) Billable Hours

1.7 SUBMISSION AND ACCEPTANCE

1.7.1 Monthly Network Analysis Updates

Meet with Government representatives at monthly intervals to review and agree on the information presented in the updated project schedule. The submission of an acceptable, updated schedule to the Government is a condition precedent to the processing of the Contractor's invoice. Submit an acceptable, updated schedule to the Government regardless of whether a Contractor's invoice is submitted for the given period. The Contractor and Government must consent to agree on percentage of payment for each activity progressed during the update period. Monthly update schedules must incorporate as-built events as they occurred and provide ongoing status of anticipated finish dates. As-built events must correspond to contemporaneous records including but not limited to submittals, daily production reports and quality control reports.

Provide the following with each Schedule submittal:

a. Time-Scaled Logic Diagram.

b. Reports listed in paragraph entitled "REQUIRED TABULAR REPORTS."

c. Data disks containing the project schedule. Include the back-up native .xer program files.

1.7.2 As-Built Schedule

As a condition precedent to the release of retention and making final payment, submit an "As-Built Schedule," as the last schedule update showing all activities at 100 percent completion. This schedule must reflect the exact manner in which the project was actually constructed.

1.8 CONTRACT MODIFICATION

Submit a Time Impact Analysis (TIA) with each cost and time proposal for a proposed change. TIA must illustrate the influence of each change or delay on the Contract Completion Date or milestones. No time extensions will be granted nor delay damages paid unless a delay occurs which consumes all available Project Float, and extends the Projected Finish beyond the Contract Completion Date.

a. Each TIA must be in both narrative and schedule form. The narrative must define the scope and conditions of the change; provide start and finish dates of impact, successor and predecessor activity to impact period, responsible party; describe how it originated, and how it impacts the schedule. The schedule submission must consist of three native files:

   (1) Fragnet used to define the scope of the changed condition

   (2) Most recent accepted schedule update as of the time of the proposal or claim submission that has been updated to show all activity progress as of the time of the impact start date.

   (3) The impacted schedule that has the fragnet inserted in the updated schedule and the schedule “run” so that the new completion date is determined.

b. For claimed as-built project delay, the inserted fragnet TIA method must be modified to account for as-built events known to occur after the data date of schedule update used.

c. All TIAs must include any mitigation, and must determine the apportionment of the overall delay assignable to each individual delay. The associated narrative must clearly describe the findings in a chronological listing beginning with the earliest delay event.

(1) Identify types of delays as follows:

(a) Excusable Delay: Force-Majeure (e.g. weather) - Contractor may receive time extension, but time will not be compensable.

(b) Inexcusable Delay: Contractor Responsibility – Contractor will not receive time extension.

(c) Compensable Delay: Government Responsibility – Contractor may receive compensable time extension.

(2) If a combination of any of the delay types outlined above occurs, it is considered Concurrent Delay, which will require an analysis of the facts to determine compensability and entitlement to any time extension under the applicable contract clauses.

d. Submit Data disks containing the narrative and native schedule files.

e. Unless the Contracting Officer requests otherwise, only add conformed contract modifications into the Project NAS.

1.8.1 No Reservation of Rights

All direct costs, indirect cost, and time extensions will be negotiated and made full, equitable and final at the time of modification issuance.

1.9 PROJECT FLOAT

Project Float is the length of time between the Contractor's Projected Completion Milestone and the Contract Completion Date Milestone. Project Float available in the schedule will not be for the exclusive use of either the Government or the Contractor.

The use of Resource Leveling or other techniques used for the purpose of artificially adjusting activity durations to consume float and influence critical path is prohibited.

1.10 THREE-WEEK LOOK AHEAD SCHEDULE

Prepare and issue a 3-Week Look Ahead schedule to provide a more detailed day-to-day plan of upcoming work identified on the Project Network Analysis Schedule. Key the work plans to NAS activity numbers and update each week to show the planned work for the current and following two-week period. Additionally, include upcoming outages, closures, field evaluation tests, preparatory meetings, and initial meetings. Identify critical path activities on the Three-Week Look Ahead Schedule. The detail work plans are to be bar chart type schedules, derived from but maintained separately from the Project NAS on an electronic spreadsheet program and printed on 8-1/2 by 11 inch sheets as directed by the Contracting Officer. Activities

must not exceed 5 working days in duration and have sufficient level of detail to assign crews, tools and equipment required to complete the work. Deliver three hard copies and one electronic file of the 3-Week Look Ahead Schedule to the Contracting Officer no later than 8 a.m. each Monday and review during the weekly CQC Coordination or Production Meeting.

1.11 CORRESPONDENCE AND TEST REPORTS

All correspondence (e.g., letters, Requests for Information (RFIs), e-mails, meeting minute items, Production and QC Daily Reports, material delivery tickets, photographs) must reference Schedule activity IDs that are being addressed. All test reports (e.g., concrete, soil compaction, weld, pressure) must reference schedule activity IDs that are being addressed.

1.12 ADDITIONAL SCHEDULING REQUIREMENTS

Any references to additional scheduling requirements, including systems to be inspected, tested and commissioned, that are located throughout the remainder of the Contract Documents, are subject to all requirements of this section.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES
05/11

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to or commencing work on site.

Certificates of insurance

Surety bonds

List of proposed Subcontractors

List of proposed products

Construction progress schedule

Network Analysis Schedule (NAS)

Submittal register

Schedule of prices

Health and safety plan

Work plan

Quality Control(QC) plan

Environmental protection plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts,

instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier,

installer or Subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (MSDS)concerning impedances, hazards and safety precautions.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

Interim "DD Form 1354" with cost breakout for all assets 30 days prior to facility turnover.

1.1.2 Approving Authority

Office or designated person authorized to approve submittal.

1.1.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor QC approval. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

1.3 PREPARATION

1.3.1 Transmittal Form

Transmit each submittal, except sample installations and sample panels to office of approving authority. Transmit submittals with transmittal form prescribed by Contracting Officer and standard for project. On the transmittal form identify Contractor, indicate date of submittal, and include information prescribed by transmittal form and required in paragraph entitled, "Identifying Submittals," of this section. Process transmittal forms to record actions regarding samples installations panels.

1.3.2 Identifying Submittals

When submittals are provided by a Subcontractor, the Prime Contractor is to prepare, review and stamp with Contractor's approval all specified submittals prior to submitting for Government approval.

Identify submittals, except sample installations and sample panels, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:

a. Project title and location.

b. Construction contract number.

c. Date of the drawings and revisions.

d. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other subcontractor associated with the submittal.

e. Section number of the specification section by which submittal is required.

f. Submittal description (SD) number of each component of submittal.

g. When a resubmission, add alphabetic suffix on submittal description, for example, submittal 18 would become 18A, to indicate resubmission.

h. Product identification and location in project.

1.3.3 Format for SD-02 Shop Drawings

Shop drawings are not to be less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless other form is required. Drawings are to be suitable for reproduction and be of a quality to produce clear, distinct lines and letters with dark lines on a white background.

Present 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.

Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled, "Identifying Submittals," of this section.

Number drawings in a logical sequence. Each drawing is to bear the number of the submittal in a uniform location adjacent to the title block. Place the Government contract number in the margin, immediately below the title block, for each drawing.

Reserve a blank space, no smaller than 4 inches on the right hand side of each sheet for the Government disposition stamp.

Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

Include the nameplate data, size and capacity on drawings. Also include applicable federal, military, industry and technical society publication references.

1.3.4 Format of SD-03 Product Data and SD-08 Manufacturer's Instructions

Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.

Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.

Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of SD-07 Certificates.

Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, submit as specified for SD-07 Certificates.

Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal and marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of construction effort.

Submit manufacturer's instructions prior to installation.

1.3.5 Format of SD-04 Samples

Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:

a. Sample of Equipment or Device: Full size.

b. Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.

c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.

d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.

e. Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.

f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.

g. Sample Panel: 4 by 4 feet.

h. Sample Installation: 100 square feet.

Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.

Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples are to be in undamaged condition at time of use.

Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean up of project.

When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.3.6 Format of SD-05 Design Data and SD-07 Certificates

Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.

1.3.7 Format of SD-06 Test Reports and SD-09 Manufacturer's Field Reports

Provide reports on 8 1/2 by 11 inches paper in a complete bound volume.

Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

1.3.8 Format of SD-10 Operation and Maintenance Data (O&M)

Comply with the requirements specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA for O&M Data format.

1.3.9 Format of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.

1.4 QUANTITY OF SUBMITTALS

1.4.1 Number of Copies of SD-02 Shop Drawings

Submit six copies of submittals of shop drawings requiring review and approval only by QC organization and seven copies of shop drawings requiring review and approval by Contracting Officer.

1.4.2 Number of Copies of SD-03 Product Data and SD-08 Manufacturer's Instructions

Submit in compliance with quantity requirements specified for shop drawings.

1.4.3 Number of Samples SD-04 Samples

a. Submit one samples, or one sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.

b. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

1.4.4 Number of Copies SD-05 Design Data and SD-07 Certificates

Submit in compliance with quantity requirements specified for shop drawings.

1.4.5 Number of Copies SD-06 Test Reports and SD-09 Manufacturer's Field Reports

Submit in compliance with quantity and quality requirements specified for shop drawings other than field test results that will be submitted with QC reports.

1.4.6 Number of Copies of SD-10 Operation and Maintenance Data

Submit three copies of O&M Data to the Contracting Officer for review and approval.

1.4.7 Number of Copies of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

Unless otherwise specified, submit two sets of administrative submittals.

1.5 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.5.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.5.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government, including the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.5.3 Warranting That Variations Are Compatible

When delivering a variation for approval, Contractor, including its Designer(s) of Record, warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.5.4 Review Schedule Is Modified

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.6 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. The Government will provide the initial submittal register with the following fields completed, to the extent that will be required by the Government during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Column (f): Indicate approving authority for each submittal.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

1.6.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.6.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.6.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.6.4 Action Codes

Entries for columns (j) and (o), are to be used are as follows (others may be prescribed by Transmittal Form):

1.6.4.1 Government Review Action Codes

"A" - "Approved as submitted"; "Completed"

"B" - "Approved, except as noted on drawings"; "Completed"

"C" - "Approved, resubmission required"; "Resubmit"

"D" - "Returned by correspondence"; "Completed"

"E" - "Disapproved (See attached)"; "Resubmit"

"F" - "Receipt acknowledged"; "Completed"

"G" - "Other (Specify)"; "Resubmit"

"X" - "Receipt acknowledged, does not comply"; "Resubmit"

1.6.5 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.7 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 30 calendar days will be allowed and shown on the register for review and approval of submittals for food service equipment and refrigeration and HVAC control systems.

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have

been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

e. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 15 working days for submittals for QC Manager approval and 20 working days for submittals for Contracting Officer approval. Period of review for submittals with Contracting Officer approval begins when Government receives submittal from QC organization.

f. For submittals requiring review by fire protection engineer, allow review period, beginning when Government receives submittal from QC organization, of 30 working days for return of submittal to the Contractor.

g. Period of review for each resubmittal is the same as for initial submittal.

1.7.1 Reviewing, Certifying, Approving Authority

The QC organization is responsible for reviewing and certifying that submittals are in compliance with contract requirements. Approving authority on submittals is QC Manager unless otherwise specified for specific submittal. At each "Submittal" paragraph in individual specification sections, a notation "G," following a submittal item, indicates Contracting Officer is approving authority for that submittal item.

1.7.2 Constraints

Conform to provisions of this section, unless explicitly stated otherwise for submittals listed or specified in this contract.

Submit complete submittals for each definable feature of work. Submit at the same time components of definable feature interrelated as a system.

When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.

Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.7.3 QC Organization Responsibilities

a. Note date on which submittal was received from Contractor on each submittal.

b. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.

c. Review submittals for conformance with project design concepts and compliance with contract documents.

d. Act on submittals, determining appropriate action based on QC organization's review of submittal.

(1) When QC Manager is approving authority, take appropriate action on submittal from the possible actions defined in paragraph entitled, "Approved/Accepted Submittals," of the section."

(2) When Contracting Officer is approving authority or when variation has been proposed, forward submittal to Government with certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate. The QC organization's review of submittal determines appropriate action.

e. Ensure that material is clearly legible.

f. Stamp each sheet of each submittal with QC certifying statement or approving statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.

(1) When approving authority is Contracting Officer, QC organization will certify submittals forwarded to Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number _____, is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by Submittal Reviewer _____, Date _____
(Signature when applicable)

Certified by QC Manager _____, Date _____"
(Signature)

(2) When approving authority is QC Manager, QC Manager will use the following approval statement when returning submittals to Contractor as "Approved" or "Approved as Noted."

"I hereby certify that the (material) (equipment) (article) shown and marked in this submittal and proposed to be incorporated with contract Number _____, is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is approved for use.

Certified by Submittal Reviewer _____, Date _____
(Signature when applicable)

Approved by QC Manager _____, Date _____"
(Signature)

g. Sign certifying statement or approval statement. The QC organization member designated in the approved QC plan is the person signing certifying statements. The use of original ink for signatures is required. Stamped signatures are not acceptable.

h. Update submittal register as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by Contracting Officer.

i. Retain a copy of approved submittals at project site, including

Contractor's copy of approved samples.

1.8 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

a. Note date on which submittal was received from QC Manager.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph entitled, "Review Notations," of this section and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date approved submittals. One copies of the approved submittal will be retained by the Contracting Officer and six copies of the submittal will be returned to the Contractor.

1.8.1 Review Notations

Contracting Officer review will be completed within 30 calendar days after date of submission. Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.

b. Submittals marked "approved as noted" "or approved except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.

d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.9 DISAPPROVED OR REJECTED SUBMITTALS

Contractor shall make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the clause entitled, "Changes," is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, the Contractor shall make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.10 APPROVED/ACCEPTED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing and other information are satisfactory.

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.11 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 33 29

SUSTAINABILITY REPORTING
02/15

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 HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 189.1	(2011; Errata 1-2 2012; INT 1 2013; Errata 3-8 2013) Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

ANSI/SMACNA 008	(2007) IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition

U.S. DEPARTMENT OF ENERGY (DOE)

ISWG Guiding Principles	(2008) High Performance and Sustainable Buildings Guidance

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED GBDC Ref Guide	(2009; R 2010) LEED Reference Guide for Green Building Design, Construction and Major Renovations of Commercial and Institutional Buildings including Core & Shell and K-12 Projects

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

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2 SUMMARY

This specification includes general requirements and procedures for this project to be constructed and documented per the federally mandated "Guiding Principles" (GP), Third Party Certification (TPC) requirements (if applicable), UFC 1-200-02, High Performance and Sustainable Building Requirements, and other requirements identified in this specification.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor QC approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in

conformance to this section. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preliminary Sustainability Notebook; G

Preliminary High Performance and Sustainable Building Checklist

SD-07 Certificates

Third Party Certification (TPC)

SD-11 Closeout Submittals

Final Sustainability Notebook; G

Final High Performance and Sustainable Building Checklist; G

Amended Final Sustainability Notebook; G

Third Party Certification Plaque and Certificates; G

1.4 GUIDING PRINCIPLES VALIDATION (GPV)

NOTE:
1. GUIDING PRINCIPLES VALIDATION (GPV) applies to all building projects (vertical construction) in accordance with UFC 1-200-02 High Performance and Sustainable Building Requirements.

2. Only GPV (which includes at a minimum HPSB Checklist and initial Sustainability Action Plan) is required for the following types of projects:

a. New construction or renovation projects that require a very limited number of construction trades. Examples include: interior painting, replacing floor material, repairing roofs, or resurfacing parking lot.

b. Renovation projects less than $2.5 Million.

Provide construction related sustainability documentation to verify achievement of ISWG Guiding Principles Validation (GPV). Provide the following for GPV:

a. Refer to Attachment 1, HPSB Checklist at the end of this specification section.

b. Obtain approval of any changes to the HPSB Checklist from the Contracting Officer at the Preconstruction Conference. Contracting Officer's approval establishes identified ISWG Guiding Principles Requirements as the project's sustainability goals.

No variations or substitutions to the HPSB Checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any changes that impact meeting the approved ISWG Guiding Principles Requirements for this project and demonstrate that change will not incur additional construction cost or increase the life cycle cost.

c. Include all work required to incorporate the applicable ISWG Guiding Principles Requirements indicated on the HPSB Checklist and in this contract.

d. Include construction related documentation to maintain an up-to-date Sustainability Notebook. Supplement construction related documentation containing the following components;

(1) HPSB Checklist

(2) Sustainability Action Plan

(3) Documentation illustrating Guiding Principle (GP) Requirements compliance

(4) Commissioning Plan and Reports

1.4.1 Sustainability Action Plan

Include the following information in the Sustainability Action Plan:

a. Contractor's planned method to achieve each construction related GP requirement.

b. For each designated construction related ISWG Guiding Principles Requirements that is not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

c. Name and contact information for: Contractor's POC responsible for ensuring sustainability goals are accomplished and documentation is assembled.

1.4.2 Costs

Contractor is responsible for all costs associated with constructing and demonstrating that project complies with approved ISWG Guiding Principles Requirements.

1.4.3 Calculations

Provide calculations, product data, and certifications required in this section to demonstrate compliance with the ISWG Guiding Principles Requirements.

1.4.4 Third Party Certification (TPC) Documentation

This project has been designed for, and must be constructed to attain a sustainability rating of LEED GBDC Ref Guide Silver or as indicated in each task order . Project is already registered with the TPC Organization. Provide construction related sustainability documentation, in the format required by the TPC Organization, to the Contracting Officer for approval, and for final approval by the TPC organization. Third Party Certification is met when Government receives TPC organization certificate and plaque. Include the following:

a. Refer to Attachment 2, TPC Checklist at the end of this specification section.

b. Obtain approval of the TPC Checklist from the Contracting Officer at the Pre-Construction Conference.

   No variations or substitutions to the approved TPC checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any project changes that impact meeting the approved TPC Requirements for this project. Demonstrate that change will not: incur additional construction cost; increase the life cycle cost; impact previous TPC Design Review; or impact required TPC certification level.

c. Complete all work required to incorporate the applicable TPC Requirements.

d. Maintain the construction related information, and provide replacement pages, in the Sustainability Notebook pertaining to additions and changes to the approved sustainability requirements. The Sustainability Notebook is in electronic format and is explained in the paragraph entitled "SUSTAINABILITY NOTEBOOK". The Sustainability Notebook contains the following components in addition to the GPV components above:

   (1) TPC Checklist

   (2) Sustainability Action Plan

   (3) Completed TPC documentation for each identified prerequisite and credit. Upload onto the TPC Online documentation website.

   (4) Copy of all correspondence with the TPC organization.

e. Include the following information in the Sustainability Action Plan. Provide this TPC information in addition to the GPV Action Plan items above:

   (1) Contractor's planned method to achieve each TPC requirement.

   (2) For each required TPC credit that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

   (3) Provide the commissioning plan and schedule for performance testing.

   (4) Name and contact information for: Contractor's Sustainability POC and other names of sustainability professionals on the Contractor's Staff responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled. Contractor's Sustainability POCs are also responsible for ensuring GPV required in paragraph GUIDING PRINCIPLES VALIDATION (GPV) above.

f. Contractor is responsible for all costs associated with constructing

and demonstrating that project complies with approved TPC requirements, including but not limited to:

(1) TPC coordination with Government's AE and other consultants, TPC website requirements, and management for construction related documentation.

(2) Construction work required to incorporate TPC prerequisites and credits.

(3) Submittals required to demonstrating compliance with Government approved TPC checklists.

g. Provide all calculations, product data, and certifications required in this contract to demonstrate compliance with the TPC Requirements of this section.

1.4.5 Third Party Certification (TPC)

Contractor is responsible for registering and meeting all requirements to achieve Third Party Certification (TPC) level of LEED GBDC Ref Guide Silver or as indicated in each Task Order , or other Government-approved equivalent TPC sustainability certification. An equivalent TPC organization must demonstrate equivalency for Government consideration, prior to use on the project. Third Party Certification is met when Government receives TPC organization certificate and plaque.

Register project with TPC organization using the following format and content:

a. Project Title First Line: US Army, US Air Force, US Navy or US Marine Corps, Building Name (if known)

b. Project Title Second Line: MILCON P#, DD1391 Project Name

c. Project Address: UIC (Installation code), Category code, RPUID (Real Property Unique Identifier) Number

d. Project Owner Organization: US Army, US Air Force, US Navy or US Marine Corps

e. Primary Contact, Owner: Agency Project Manager

f. Additional Contact, Building Owner: Public Works Officer or Designee

The TPC Certification requires the following:

a. Refer to Attachment 2, TPC Checklist at the end of this specification section.

b. Obtain approval of the TPC Checklist from the Contracting Officer at the Pre-Construction Conference.

No variations or substitutions to the approved TPC checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any project changes that impact meeting the approved TPC Requirements for this project. Demonstrate that change will not: incur additional construction cost; increase the life cycle cost; impact previous TPC

Design Review; or impact required TPC certification level.

c. Complete all work required to incorporate the applicable TPC Requirements.

d. Maintain the construction related information, and provide replacement pages, in the Sustainability Notebook pertaining to additions and changes to the approved sustainability requirements. The Sustainability Notebook is in electronic format and is explained in the paragraph entitled "SUSTAINABILITY NOTEBOOK". The Sustainability Notebook contains the following components in addition to the GPV components above:

(1) TPC Checklist

(2) Completed TPC Online forms for each identified prerequisite and credit

(3) Copy of all correspondence with the TPC organization including proof of TPC registration

(4) Documentation illustrating compliance with TPC requirements

(5) TPC Award Certificate

e. Include the following information in the Sustainability Action Plan. Provide this TPC information in addition to the GPV Action Plan items above:

(1) Contractor's planned method to achieve each TPC requirement.

(2) For each required TPC credit that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

(3) Name and contact information for: Contractor's Sustainability POC and other names of sustainability professionals on the Contractor's Staff responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled

(4) Provide the plan and schedule for performance testing, data collection, and commissioning.

f. Contractor is responsible for all costs associated with constructing and demonstrating that project complies with approved TPC requirements, including but not limited to:

(1) Final TPC review, certification and plaque fees

(2) Online (or offline with secure facilities) TPC management and documentation.

(3) Obtaining TPC certification based on Government-approved sustainability goals.

(4) Construction work required to incorporate TPC prerequisites and

credits.

(5) Submittals required to demonstrate compliance with Government approved TPC checklists.

g. Provide all calculations, product data, and certifications required in this specification to demonstrate compliance with the TPC Requirements.

h. Provide all online (or offline, with secure facilities) TPC management and documentation.

i. Contractor is responsible for all required responses to TPC.

j. Provide TPC Plaque and Certificates. Use format below to create the Plaque, Certificate and Letter of Congratulations. Forward to parties designated by Contracting Officer:

(1) Plaque:

Name: Final Building Name. If unknown, provide Form DD1391 Project Name.

(2) Certificate:

Project Title, first line: P-(X); Form DD1391 Project Name).

Project Title, second line: UIC (Installation code)

(3) Letter Congratulations:

Address letter to Facility's Installation commander Name. Address the letter to an individual person.

1.5 SUSTAINABILITY SUBMITTALS

Provide documentation in the Sustainability Notebook and the HPSB Checklist to indicate compliance with the sustainability requirements of the project.

1.5.1 "S" Submittals for Sustainability Documentation

Submit the GPV and TPC sustainability documentation required in this specification as "S" submittals. Highlight GPV and TPC compliance data in "S" submittal.

1.5.2 SUSTAINABILITY NOTEBOOK

Provide and maintain a comprehensive Sustainability Notebook to document compliance with the sustainability requirements identified in the approved HPSB and TPC Checklists. Sustainability Notebook must contain all required data to support full compliance with the ISWG Guiding Principles Requirements and TPC requirements. Sustainability Notebook is in the form of an Adobe PDF file; bookmarked at each ISWG Guiding Principles Requirement , TPC requirement,and sub-bookmarked at each document. Match format to ISWG Guiding Principles numbering system indicated herein. Maintain up to date information, spreadsheets, templates, and other required documentation with each current submittal. For TPC projects, provide a second Table of contents using TPC numbering system. Locate documentation unique to TPC here. Where TPC documentation would repeat GP

documentation, insert note referring reviewer to GP documentation.

Contracting Officer may deduct from the monthly progress payment accordingly if Sustainability Notebook information is not current, until information is updated and on track per project goals.

1.5.2.1 Sustainability Notebook Submittal Schedule

Provide Sustainability Notebook Submittals at the following milestones of the project:

a. Preliminary Sustainability Notebook

Submit preliminary Sustainability Notebook for approval at the Pre-construction conference. Include Preliminary High Performance and Sustainable Building Checklist.

b. Construction Progress Meetings. Update GP and TPC documentation in the Sustainability Notebook and TPC Online tool for each meeting.

c. Final Sustainability Notebook

Submit updated Sustainability Notebook within 60 days after the Beneficial Occupancy Date (BOD). Final progress payment retainage may be held by Contracting Officer until final sustainability documentation is complete. Submit three (3) electronic copies of the Final Sustainability Notebook on DVDs to the Government. Include Final High Performance and Sustainable Building Checklist.

d. Amended Final Sustainability Notebook

Amend and resubmit the Final Sustainability Notebook to include commissioning, testing and balancing, and collection of performance requirements. Submit three (3) final electronic copies of the Amended Final Sustainability Notebook Submittal on DVDs to the Government no longer than 30 days after the GP, TPC, and Cx designated data collection period.

1.5.3 HIGH PERFORMANCE SUSTAINABLE BUILDING (HPSB) CHECKLIST

Provide construction documentation that provides proof of and supports compliance with the completed HBSP Checklist.

1.5.3.1 HPSB Checklist Submittals

Submit an updated copy of the HPSB Checklist with each Sustainability Notebook submittal. Attach HPSB Checklist to DD1354 Real Property Record Submittal.

1.5.3.2 HPSB Checklist Public Access

Where not included as attachment to this specification section, use the following as HPSB Checklist for respective service branch. Where Internet address appears on two lines, copy full address into Internet browser.

a. Air Force - Air Force MILCON Sustainability Requirements Scoresheet, Attachment 3 of "AF Sustainable Design Development Implementing Guidance Memo"

http://www.wbdg.org/ccb/browse_cat.php?c=265

b. Army - Energy & Sustainability Record Card
http://wbdg.org/ccb/ARMYCOE/COEECB/ecb_2013_25.pdf

c. Navy - NAVFAC Sustainability & Energy Data Record Card/High Performance and Sustainable Building Checklist
http://www.wbdg.org/pdfs/navfac_sustainable_energy_data_record_card.pdf

1.6 DOCUMENTATION REQUIREMENTS

Third Party Certification requirements or credits are mandatory when they have requirements that match a Guiding Principle Requirement. Documentation used to demonstrate TPC compliance may be used to demonstrate GP compliance.

Incorporate each of the following ISWG Guiding Principles Requirements into project construction; and provide documentation that proves compliance with each listed requirement. Items below are organized according to the ISWG Guiding Principles. For projects that require TPC, refer to Third Party Certifier's reference manuals for TPC requirements.

1.6.1 Commissioning

Work with the Commissioning Authority (CxA) to achieve requirements of the Commissioning plan and other contract document requirements at each stage of commissioning. Maintain up-to-date records of commissioning activities in the Sustainability Notebook, to include commissioning plan and summary commissioning report.

1.6.2 Energy Efficient Equipment

Provide only energy-using equipment that is Energy Star rated, or has the Federal Energy Management Program (FEMP) recommended efficiency. Where Energy Star or FEMP recommendations have not been established, provide equipment with efficiency in the top 25 percent for the type of equipment procured. Provide only energy using equipment that meets FEMP requirements for low standby power consumption. Energy efficient equipment can be found at: http://www1.eere.energy.gov/femp/ and http://www.energystar.gov/. Provide the following documentation:

Proof that equipment is energy efficient and complies with the cited requirements.

1.6.3 Benchmarking

Provide report of initial actual energy performance with the energy design targets. Provide the following documentation:

Prefinal Performance Report with data collected from the first 60 days of operation of the facility after Beneficial Occupancy Date (BOD). Submit this information with the Final Sustainability Notebook Submittal.

1.6.4 Reduce Volatile Organic Compounds (VOC)

Provide materials and products with low pollutant emissions, including composite wood products, adhesives, sealants, interior paints and finishes, carpet systems, and furnishings. Meeting the requirements of ASHRAE 189.1 Sections 8.4.2 (Prescriptive Option: Materials) or Section 8.5.2

(Performance Option: Materials) demonstrates compliance. Provide the following documentation:

a. Demonstrate that materials do not exceed maximum VOC emissions of cited standards. VOC averaging is allowed where coatings are subject to human contact or harsh environmental conditions.

b. Demonstrate that flooring materials comply with VOC emissions of cited standards.

c. Demonstrate that composite wood and agrifiber products and associated laminating adhesives contain no added urea-formaldehyde.

d. Demonstrate that furniture and seating complies with low emissions requirements.

e. Create and maintain a list of above listed products used on the project within the building vapor barrier. Demonstrate how product meets cited standards.

1.6.5 Indoor Air Quality During Construction

Prior to construction, create indoor air quality plan. Implement IAQ plan during construction and flush building air before occupancy.

a. Construction submittal documentation required:

(1) For new construction and for renovation of unoccupied existing buildings, comply with ASHRAE 189.1 Section 10.3.1.4. (Indoor Air Quality (IAQ) Construction Management), with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent. For renovation of occupied existing buildings, comply with ANSI/SMACNA 008 IAQ Guidelines for Occupied Buildings Under Construction.

(2) Provide required documentation showing that after construction ends and prior to occupancy, new HVAC filters were installed, and building air was flushed out in accordance with UFC 1-200-02.

1.6.6 Recycled Content

Provide materials on this project with aggregated total recycled content greater than 10 percent. In addition, comply with 40 CFR 247. Refer to http://www.epa.gov/cpg/products.htm for assistance identifying products cited in 40 CFR 247. Provide the following documentation:

a. Total amount of recycled content contained in building materials as a percentage of total cost of all building materials on the project (mechanical, electrical, and plumbing components, fire protection equipment and transportation are excluded).

b. Substitutions: Contractor may submit for Government approval, proposed alternative products or systems that provide equivalent performance and appearance and have greater contribution to project recycled content requirements. For all such proposed substitutions, submit with the Sustainability Action Plan accompanied by product data demonstrating equivalence.

1.6.7 Bio-Based Products

Utilize products and material made from biobased materials to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. Use only supplies and materials of a type and quality that conform to applicable specifications and standards.

Biobased products that are designated for preferred procurement under the USDA BioPreferred Program must meet the required minimum biobased content. Refer to http://www.biopreferred.gov for the product categories and BioPreferred Catalog. Provide the following documentation:

a. For biobased products used on this project, provide biobased content and biobased source of material. Indicate name of the manufacturer, cost of each product and the use of each product on this project.

1.6.8 Landfill Disposal

Divert construction debris from landfill disposal in accordance with Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT. Provide the following documentation:

a. Documentation showing total amount of construction debris diverted from landfill as a percentage of all construction debris on the project.

b. Include project's Construction Waste Management Plan and all dumpster haul tickets.

1.6.9 Ozone Depleting Substances

Eliminate the use of ozone depleting substances during and after construction where alternative environmentally preferable products are available. Meet the requirements of ASHRAE 189.1 Section 9.3.3 Refrigerants for no CFC-based refrigerants in heating ventilation, air conditioning and refrigeration systems (except for fire suppression system requirements, covered elsewhere in this specification). Provide the following documentation:

a. MSDS sheets for all refrigerants provided

b. Products that meet the criteria of U.S. EPA Significant New Alternatives Policy, available at http://www.epa.gov/ozone/snap/index.html.

1.6.10 Validation and Certification Restrictions

The Contractor's purchase of renewable energy certificates (RECs) specifically to meet project sustainability goals is prohibited.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 SUSTAINABILITY COORDINATION

3.1.1 Coordinating Sustainability Documentation Progress

Provide sustainability focus and coordination at the following meetings to achieve sustainability goals. Contractor's designated TPC accredited sustainability professional responsible for GP and TPC documentation must participate in the following meetings to coordinate documentation completion.

a. Pre-Construction Conference: Discuss the following: TPC and HPSB Checklists, Sustainability Action Plan, Construction submittal requirements and schedule, individuals responsible for achieving each Guiding Principle Requirement and TPC prerequisite and credit.

b. Construction Progress Meetings: Review GP and TPC sustainability requirements with project team including contractor and sub-contractor representatives. Demonstrate GP and TPC documentation is being collected and updated to the Sustainability Notebook and TPC Online tool.

   (1) Facility Turnover Meetings: Review Sustainability Notebook, and TPC Online submission for completeness and identify any outstanding issues relating to final documentation requirements.

   (2) Final Sustainability Notebook Review

3.2 SUSTAINABILITY AWARD

Finalize the sustainability certification process and obtain the TPC Certification Plaque and Certificates, indicating completion of the projects sustainability goals.

3.2.1 Third Party Certification Plaque and Certificates

Obtain and install plaque and provide one original framed copy of the certificate. Mount certificates in 1 inch deep metal frames, with double matt, and wire hangers. Obtain one additional certificates, and deliver to Contractor Officer, unless otherwise instructed. Hang the Plaque in a prominent interior location approved by the Contracting Officer.

-- End of Section --

SECTION 01 35 13

SPECIAL PROJECT PROCEDURES
11/11

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.

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 150/5300-13	(2012; Rev A; Change 1 2014) Airport Design
FAA AC 70/7460-1	(2007; Rev K) Obstruction Marking and Lighting

1.2 DEFINITIONS

1.2.1 Landing Areas

"Landing Areas" means:

a. The primary surfaces, comprising the surface of the runway, runway shoulders, and lateral safety zones. The length of each primary surface is the same as the runway length. The width of each primary surface is 2000 feet (1000 feet on each side of the runway centerline). Exceptions: Some airfields are based on a primary width of 1500 feet (750 feet on each side of the runway centerline). In such instances, substitute the proper width in the applicable statements.

b. The "clear zone" beyond the ends of each runway is the extension of the primary surface for a distance of 1000 feet beyond each end of each runway.

c. All taxiways, plus the lateral clearance zones along each side for the length of the taxiways (the outer edge of each lateral clearance zone is laterally 250 feet from the far or opposite edge of the taxiway (example: a 75 foot widetaxiway must have a combined width and lateral clearance zone of 425 feet.)

d. All aircraft parking aprons, plus the area 125 feet in width extending beyond each edge all around the aprons.

1.2.2 Safety Precaution Areas

“Safety Precaution Areas” means those portions of approach-departure clearance zones and transitional zones where placement of objects incident to contract performance might result in vertical projections at or above the approach-departure clearance, or the transitional surface.

a. The “approach-departure clearance surface” is an extension of the primary surface and the clear zone at each end of each runway, for a distance of 50,000 feet, first along an inclined (glide angle) and then

along a horizontal plane, both flaring symmetrically about the runway centerline extended.

(1) The inclined plane (glide angle) begins in the clear zone 200 feet past the end of the runway (and primary surface) at the same elevation as the end of the runway. It continues upward at a slope of 50:1 (1 foot vertically for each 50 feet horizontally) to an elevation of 500 feet above the established airfield elevation. At that point the plane becomes horizontal, continuing at that same uniform elevation to a point 50,000 feet longitudinally from the beginning of the inclined plane (glide angle) and ending there.

(2) The width of the surface at the beginning of the inclined plane (glide angle) is the same as the width of the clear zone. It then flares uniformly, reaching the maximum width of 16,000 feetat the end.

b. The “approach-departure clearance zone” is the ground area under the approach-departure clearance surface.

c. The “transitional surface” is a sideways extension of all primary surfaces, clear zones, and approach-departure clearance surfaces along inclined planes.

(1) The inclined plane in each case begins at the edge of the surface.

(2) The slope of the incline plane is 7:1 (1 foot vertically for each 7 feet horizontally). It continues to the point of intersection with the:

(a) Inner horizontal surface (which is the horizontal plane 150 feet above the established airfield elevation); or

(b) Outer horizontal surface (which is the horizontal plane 500 feet above the established airfield elevation), whichever is applicable.

d. The “transitional zone” is the ground area under the transitional surface. (It adjoins the primary surface, clear zone, and approach-departure clearance zone.)

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Heavy Equipment and Vehicle List

Existing Conditions Survey

Construction Operations Plan

Safety Plan

Schedule of Work

Watercraft list

SD-04 Samples

Model Unit

PART 2 PRODUCTS

2.1 AIRFIELD OBSTRUCTION LIGHTS

Airfield obstruction lights must conform to FAA AC 70/7460-1 and have red or white lenses.

PART 3 EXECUTION

3.1 HAZARDS TO AIRFIELD OR HELIPORT OPERATION

In addition to "DFARS 252.236-7005, Airfield Safety Precautions," the following paragraphs apply.

3.1.1 Work in Proximity to Landing AreasLanding Strips or Landing Pad(s)

Place nothing upon the landing area or applicable portions of safety precaution areas without authority of the Contracting Officer.

Use of landing areaslanding strips or landing pads for purposes other than aircraft operation,is prohibited without permission of the Contracting Officer, and the landing arealanding strip or landing pad is closed by order of the Contracting Officer and marked as indicated herein.

Accomplish all construction work on the runways, taxiways, and parking aprons and in the end zones of the runways and 75 feet to each side of the runways and taxiways, the landing strip, 75 feet to each side thereof, and on the taxiways and parking apronsthe landing pad(s) with extreme care regarding the operation of aircraft. Cooperate closely, and coordinate with the Operations Officer and the Contracting Officer. Park equipment in an area designated by the Contracting Officer. Parking of equipment, vehicles, or any type of storage overnight or for any extended period of time in the proximity of the landing areas or taxiways, landing strip, or landing pad is strictly prohibited. Leave no material in areas where extreme care is to be taken regarding the operation of aircraft.

During periods of active performance of work on the airfield by the Contractor, govern all operations of mobile equipment per the safety provisions.

3.1.2 Schedule of Work/Aircraft Operating Schedules

Schedule work to conform to aircraft operating schedules. The Government will exert every effort to schedule aircraft operations so as to permit the maximum amount of time for the Contractor's activities; however, in the event of emergency, intense operational demands, adverse wind conditions, and other such unforeseen difficulties, the Contractor must cease operations at the specified locations in the aircraft operational area for the safety of the Contractor and military personnel and Government property. Submit a schedule of the work to the Contracting Officer for transmittal to the Operations Officer describing the work to be

accomplished; the location of the work, noting distances from the ends of landing areas, taxiways, landing strips, landing pads and buildings and other structures as necessary; and dates and hours during which the work is to be accomplished. Keep the approved schedule of work current, and notify the Contracting Officer of any changes prior to beginning each day's work.

Prior to commencement of work, submit the following to the Contracting Officer for transmittal to the Operations Officer:

Existing Conditions Survey
Construction Operations Plan
Safety Plan
Heavy Equipment and Vehicle List

Where flying is controlled, additional permission must be obtained from the control tower operator to enter a landing area unless such area is marked as hazardous to aircraft.

3.1.3 Daytime Markings

During daylight, mark stationary and mobile equipment with international orange and white checkered flags, mark the material, and work with yellow flags.

Vehicles operating in the landing area, must be identified by means of a flag on a staff attached to and flying above the vehicle. Flag size must be not less than 3 feet square and consist of a checkered pattern of international orange and white squares not less than 1 foot on each side. Flags varying in any dimension by not more than 10 percent of the specified dimensions are considered to comply with the stated requirements.

3.1.4 Nighttime Markings

During nighttime, which begins 2 hours before sundown and ends 2 hours after sunrise, mark stationary and mobile equipment and material, and work with battery-operated, low-intensity, red flasher lights. Where the Operations Officer or Contracting Officer determines that the red flasher lights may confuse pilots approaching for landings, the Operations Officer or Contracting Officer may direct that the red flasher lights be left off or that the color of the lights be changed.

Light construction and installation must comply with FAA AC 70/7460-1. Lights must be operational during periods of reduced visibility, darkness, and as directed by the Contracting Officer.

No separate payments will be made for lighting and protection necessitated by the safety provisions.

3.1.5 Excavation

Open only those trenches for which material is on hand and ready for placing therein. As soon as possible after the material has been placed and work approved, backfill and compact the trenches as specified.

Maintain landing areaslandings strips or landing pads at all times free from hazards, holes, material piles, or projecting shoulders that might damage tires or landing gear. Paved surfaces must be kept clean at all times and free from small stones or other objects which could cause damage to propellers, craft, and personnel.

3.1.6 Contractor Safety Precautions

The Contractor is advised that aircraft operations will produce extremely high noise levels and will induce vibrations in pavements, structures, and equipment in the vicinity, and may result in high velocity flying debris in the area. The Contractor is responsible for providing all necessary protective eye and ear gear and other safety devices for his personnel, for insuring protection of his equipment, and for scheduling the work to eliminate hazards to his personnel and equipment and to prevent damage to work performed by him.

Boundary areas for hazardous work locations and restrictions are defined in FAA AC 150/5300-13. Construction activity within the limits of the boundary areas without approval of the Contracting Officer is prohibited.

Provide a minimum of 2 aviation red or high intensity white obstruction lights on temporary structures (including cranes) over 100 feet above ground level.

3.1.7 Radio Contact

Provide necessary battery powered portable radios, including one radio for the tower. During work within the landing area, have an operator (who speaks fluent English) available for radio contact with the tower at all times. Radio frequency must be approved by the tower.

3.2 HARBOR WATERWAYS

In addition to "DFARS 252.236-7002, Obstruction of Navigable Waterways," obtain from the Operations Officer at the Naval Base, Pearl Harbor via the Contracting Officer, permission to use Pearl Harbor waterways and the regulations and directives governing such usage. Submit a watercraft list with a description of crafts, including sizes, types, numbers and boat crew for approval.

3.2.1 Hazards to Navigation

Maintain complete control of the movement of floating equipment and material. Loose floating equipment and material are not permitted. Keep in readiness at all times a powered craft capable of moving, securing and disposing of floating equipment which may get loose and become a hazard to navigation.

3.2.2 Submarine Cables or Underwater Utilities

Physically locate submarine cables or underwater utilities as indicated prior to performance of work.

3.2.3 RIMPAC Operational Exercises

Due to the RIMPAC exercises conducted every even numbered years, the Contractor must anticipate delays and disruption in construction activities for a period of 60 consecutive calendar days during the contract. Disruption may range from complete shutdown of construction activity for a prolonged period of time or periodic short term shutdown of less than a full day, but in no event will all such shutdowns in the aggregate exceed 60 calendar days per calendar year. This affected period is anticipated between 1 April and 31 July of every even numbered year. Bidders must take

into consideration such delays when preparing their bids.

3.2.4 December 7, 1941 Commemorative Ceremonies

To minimize disturbances during Pearl Harbor's December 7, 1941 Commemorative Ceremonies, the Contractor must shut down all construction activities on the day that ceremonies are held.

3.3 MODEL UNIT

Prior to placement of material orders for components of the BEQ living suites, BOQ living suites or family housing units and the installation of those components throughout the project, the Contractor must complete the construction of the components of the model unit, and gain the approval of the Contracting Officer for the materials and workmanship therein.

3.3.1 Model Unit Description

Provide a model unit made up of enough living suites consisting of two bedrooms and an interconnecting bathroom or single family housing units to show all of the different levels of completion required below. The model unit must have enough suites or housing units to show all level of completion simultaneously, except for foundation and floor slab levels which are approved by the Contracting Officer and covered by following levels. The model unit must be living suites or family housing units constructed at the location agreed upon with the Contracting Officer and a part of the permanent structure as indicated or a temporary structure constructed to full scale at the location indicated, and demolished at the completion of the contract.

3.3.2 Model Unit Requirements

Adhere to the following requirements for model construction:

a. Provide materials in model unit identical to those actually approved in submittals. The QC Manager and Organization must be in place to approve and process submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. Do not procure, fabricate, or install materials prior to approval by the Contracting Officer.

b. The Contracting Officer retains the right to disapprove and reject materials or items which are not in compliance with the project drawings and specifications.

c. After approval of initial product submittals, provide full size samples of these components in the required color, and in sufficient quantity to completely outfit the model unit. Provide full size samples as dictated by the construction schedule for installation of those components in the model unit. Do not order or approve production of any materials beyond those required for the model unit, until the full size samples have been installed in the model unit and approved by the Contracting Officer.

d. Proceed immediately with construction of the model unit after the Contracting Officer acknowledges the required product submittals are approved.

e. Provide all temporary utilities and climate control necessary to construct, inspect, approve, and maintain the model unit.

f. Provide and maintain the following throughout the construction period of the entire project: Temporary parking at the model unit; signage from the temporary parking to the model unit; the visual approach to the unit including trash removal, lawn and landscaping maintenance.

g. Locate the model unit in an easily accessible location for public tours. The Government retains the right to use the model unit for supervised tours and public relations activities following each level of completion. Tours will take place during normal working hours.

h. Prior to completion and approval of the model unit, and with written permission to start from the Contracting Officer, the Contractor may perform general sitework and run major utility lines for the rest of the project.

3.3.3 Model Unit Levels of Completion

Exhibit and secure approval of model unit at the following levels of completion:

a. Level 1 (Pre-Finished Level) - Model unit construction within a completed building exterior must exhibit plumbing, ductwork, electrical locations, exposed framing, and windows. Leave walls and floors unfinished but ready for application of final finish. Upon completion of this level, model unit must be available to the Government for a period of five (5) working days for inspection.

b. Level 2 (Finished Level) - Model unit construction must exhibit all materials, completely finished as specified, including fixtures, wall and floor finishes, cabinets, and shelving. Upon completion, the model unit must be available to the government for a period of fifteen (15) working days for inspection.

Model unit must be exhibited and approved at the following 7 levels of completion:

Level 1, model must be available for government inspection for 28 calendar days.

Levels 2 through 7, model unit must be available for government inspection for 10 calendar days per level.

a. Level 1 (Foundation & Floor Slab Level) - Clearly demonstrate treatment of earth excavation, testing of underslab mechanical piping, earth compaction, assembly and support of concrete reinforcing, technique of concrete movement and placement, framing of foundation steps, placement of insulation, final exposed concrete finished surface treatment, location outlines of all walls, all slab penetrations, and structural support points.

b. Level 2 (Framing Level) - Clearly exhibit all load bearing and non-load bearing framing, sheathing, anchorage for exterior shell materials, and pre-trim frame-out.

c. Level 3 (Exterior Shell Level) - Exhibit all exterior finishes, windows and doors with temporary hardware, caulking, sealant, sheathing paper,

wall ties, locations of mechanical equipment, roofing, louvers, vents and trim.

d. Level 4 (Plumbing, Mechanical and Electrical rough-in Level) - Exhibit electrical conduit and box location for switches, outlets fixtures, cable and data collection, ductwork, built-in plumbing fixtures, plumbing piping, and water pressure test of all plumbing pipe.

e. Level 5 (Interior Finishes-rough Level) - Exhibit non-veneer plaster, unspackled and uncaulked wall and ceiling finishes, insulation, interior doors, final locations of all outlets and fixtures.

f. Level 6 (Interior Finishes & Fixtures-final Level) - Exhibit final interior finishes, veneer plaster, painting, caulking, built-in shelving, cabinetwork, cabinet supported sinks, final door hardware, mechanical louvers, final electrical equipment connections, electrical fixtures, freestanding bathroom fixtures, properly functioning appliances, and operation of mechanical and electrical systems.

g. Level 7 (Site Finishes Level) - Exhibit final driveway, walks, exterior stairs, final concrete and asphalt finished surface treatment, topsoil quality and application, sodding/seeding of lawn, tree and shrub planting, landscaping beds, playground fall areas and playground equipment. Contracting Officer retains the right to inspect all preparation and installation of pavings. Provide adequate notice to the Contracting Officer prior to commencing paving work.

-- End of Section --

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS
11/15

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 ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSE/SAFE Z359.2	(2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2007) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems,

	Subsystems and Components
ASSE/SAFE Z359.6	(2009) Specifications and Design Requirements for Active Fall Protection Systems
ASSE/SAFE Z359.7	(2011) Qualification and Verification Testing of Fall Protection Products
ASSE/SAFE Z490.1	(2009) Criteria for Accepted Practices in Safety, Health, and Environmental Training

ASME INTERNATIONAL (ASME)

ASME B30.20	(2013; INT Oct 2010 - May 2012) Below-the-Hook Lifting Devices
ASME B30.22	(2010) Articulating Boom Cranes
ASME B30.26	(2015; INT Jun 2010 - Jun 2014) Rigging Hardware
ASME B30.3	(2012) Tower Cranes
ASME B30.5	(2014) Mobile and Locomotive Cranes
ASME B30.8	(2010) Floating Cranes and Floating Derricks
ASME B30.9	(2014; INT Feb 2011 - Nov 2013) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2015) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2003) Guide for Protective Grounding of Power Lines
IEEE C2	(2012; Errata 2012; INT 1-4 2012; INT 5-7 2013; INT 8-10 2014; INT 11 2015) National Electrical Safety Code

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA Z535.2	(2011) Environmental and Facility Safety Signs

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2013) Standard for Portable Fire Extinguishers
NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction,Alteration, and

	Demolition Operations
NFPA 306	(2014) Standard for Control of Gas Hazards on Vessels
NFPA 51B	(2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National Electrical Code
NFPA 70E	(2015; ERTA 1 2015) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

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

10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.333	Selection and Use of Work Practices
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1915.89	Control of Hazardous Energy (Lockout/Tags-Plus)
29 CFR 1919	Gear Certification
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.1400	Cranes and Derricks in Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is 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 through provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have

occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are 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;

d. Transfer to another job;

e. Medical treatment beyond first aid;

f. Loss of consciousness; or

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

1.2.17 USACE Property and Equipment

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

1.2.18 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the

operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document any mishap that meets the criteria described in the Contractor Significant Incident Report (CSIR) using the NAVFAC prescribed Navy Crane Center (NCC) form.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Reports; G

LHE Inspection Reports

SD-07 Certificates

Contractor Safety Self-Evaluation Checklist

Crane Operators/Riggers

Standard Lift Plan; G

Critical Lift Plan ; G

Naval Architecture Analysis; G

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

Third Party Certification of Barge-Mounted Mobile Cranes

License Certificates

Radiography Operation Planning Work Sheet; G

1.4 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher.

1.5 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor at the pre-construction conference. Complete the checklist monthly and submit with each request for payment voucher. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90 may result in retention of up to 10 percent of the voucher.

1.6 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations. Submit 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 govern.

1.6.1 Subcontractor Safety Requirements

For this contract, neither Contractor nor any subcontractor may enter into contract with any subcontractor that fails to meet the following requirements. The term subcontractor in this and the following paragraphs means any entity holding a contract with the Contractor or with a subcontractor at any tier.

1.6.1.1 Experience Modification Rate (EMR)

Subcontractors on this contract must have an effective EMR less than or equal to 1.10, as computed by the National Council on Compensation Insurance (NCCI) or if not available, as computed by the state agency's rating bureau in the state where the subcontractor is registered, when entering into a subcontract agreement with the Prime Contractor or a subcontractor at any tier. The Prime Contractor may submit a written request for additional consideration to the Contracting Officer where the specified acceptable EMR range cannot be achieved. Relaxation of the EMR range will only be considered for approval on a case-by-case basis for special conditions and must not be anticipated as tacit approval. Contractor's Site Safety and Health Officer (SSHO) must collect and maintain the certified EMR ratings for all subcontractors on the project and make them available to the Government at the Government's request.

1.6.1.2 OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate

Subcontractors on this contract must have a DART rate, calculated from the most recent, complete calendar year, less than or equal to 3.4 when entering into a subcontract agreement with the Prime Contractor or a subcontractor at any tier. The OSHA Dart Rate is calculated using the following formula:

(N/EH) x 200,000

where:

N = number of injuries and illnesses with days away, restricted work, or job transfer

EH = total hours worked by all employees during most recent, complete calendar year

200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year)

The Prime Contractor may submit a written request for additional consideration to the Contracting Officer where the specified acceptable OSHA Dart rate range cannot be achieved for a particular subcontractor. Relaxation of the OSHA DART rate range will only be considered for approval on a case-by-case basis for special conditions and must not be anticipated as tacit approval. Contractor's Site Safety and Health Officer (SSHO) must collect and maintain self-certified OSHA DART rates for all subcontractors on the project and make them available to the Government at the Government's request.

1.7 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.7.1 Personnel Qualifications

1.7.1.1 Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate 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 and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs. The SSHO shall meet either one of the following minimum level requirements as indicated in each task order:

Level 1:
The SSHO is required to have a minimum of 5 years of construction industry safety experience on similar projects. Complete the 30-hour OSHA construction safety class or equivalent within the last 5 years. Complete an average of at least 24 hours of formal safety training each year for the past 5 years. Complete the 40-hour Construction Hazard Awareness Course. Achieve certification as a Safety Trained Supervisor (STS). Competent person training as needed.

Level 2:
The SSHO is required to have a minimum of 5 years of construction industry safety experience on similar projects. 30-hour OSHA construction safety class or equivalent within the last 5 years. An average of at least 24 hours of formal safety training each year for the past 5 years with training for competent person status for at least the following 4 areas of competency: 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. SSHO shall have Construction Health & Safety Technician (CHST) certification and have no other duties other than safety and occupational health management, inspections, and enforcement on this contract.

Level 3:
The SSHO is required to have a minimum of 10 years safety work of a progressive nature with at least 5 years of experience on similar projects. 30-hour OSHA construction safety class or equivalent within the last 5 years. An average of at least 24 hours of formal safety training each year for the past 5 years with training for competent person status for at least the following 4 areas of competency: 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. The SSHO shall have a Certified Safety Professional (CSP) and/or Certified Industrial Hygienist (CIH) certification. The CSP and/or CIH shall have no other duties than safety and occupational health management, inspections, and/or industrial hygiene.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. 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 that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.7.1.1.1 Additional Site Safety and Health Officer (SSHO) Requirements and Duties

The SSHO must have completed a 40 hour contract safety awareness course based on the content and principles of EM 385-1-1, and instructed in accordance with the guidelines of ASSE/SAFE Z490.1, by a trainer meeting the qualifications of paragraph QUALIFIED TRAINER REQUIREMENTS. If the SSHO does not have a current certification, certification must be obtained within 60 days, maximum, of contract award.

As a minimum this course shall provide the participant with knowledge of the unique EM 385-1-1 U.S. Army Corps of Engineers Safety and Health requirements, NAVFAC P-307 Management of Weight Handling Equipment Manual, Hazard Identification, Recommending Hazard Abatement Methods, Properly preparing a site-specific Accident Prevention Plan (APP), Activity Hazard Analysis (AHA), and other skills necessary to effectively manage a safety program for contractors doing business with the US Navy, NAVFAC, US Army Corps of Engineers and other government DOD agencies.

The 40 Hour Construction Safety Hazard Awareness Course will include a written examination that will cover the following the following safety topics as it applies to the requirements identified in the 1) EM 385-1-1 U.S. Army Corps of Engineers Safety and Health requirements Manual and 2) the NAVFAC P-307 Management of Weight Handling Equipment Manual:

Program Management, Sanitation, Medical and First-Aid Requirements, Temporary Facilities, Personal Protective and Safety Equipment, Hazardous or Toxic Agents and Environments, Lighting, Accident Prevention Signs, Tags, Labels, Signals, Piping System Identification, and Traffic Control, Fire Prevention and Protection, Welding and Cutting, Electrical, Control of Hazardous Energy, Hand and Power Tools, Material Handling, Storage, & Disposal, Rigging, Cranes and Hoisting Equipment, Conveyors, Motor Vehicles, Machinery and Mechanized Equipment, All Terrain Vehicles, Utility Vehicles, and other Specialty Vehicles, Floating Plant and Marine Activities, Pressurized Equipment Systems, Fall Protection, Work Platforms and Scaffolding, Demolition, Safe Access, Ladders, Floor & Wall Openings, Stairs and Railing Systems, Excavations and Trenching, Underground Construction (Tunnels), Shafts, and Caissons, Concrete, Masonry, Steel Erection and Residential Construction, Hazardous Waste Operations and Emergency Response (HAZWOPER), and Confined Space Entry.

This course is periodically offered by General Contractors Association of Hawaii, Hawaii Building Industry Foundation, Associated Builders and Contractors - Hawaii Chapter, and the Guam Contractors Association.

1.7.1.2 Contractor Quality Control (QC) Manager:

The Contractor Quality Control Manager cannot be the SSHO on this project, even though the QC has safety inspection responsibilities as part of the QC duties unless otherwise indicated in each task order.

1.7.1.3 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, 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) to the the Contracting Officer for information in consultation with the Safety Office.

1.7.1.3.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space.

For work involving marine operations that handle combustible or hazardous materials, this person must have the ability to understand and follow through on the air sampling, Personal Protective Equipment (PPE), and instructions of a Marine Chemist, Coast Guard authorized persons, or

Certified Industrial Hygienist. Confined space and enclosed space work must comply with NFPA 306, OSHA 29 CFR 1915, Subpart B, "Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment," or as applicable, 29 CFR 1910.147 for general industry.1.7.1.3.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.7.1.3.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

1.7.1.4 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards,Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements.

b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

c. Update training course materials whenever an update of the EM 385-1-1 becomes available.

d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

e. Request, review and incorporate student feedback into a continuous course improvement program.

1.7.1.5 Dredging Contract Requirements

1.7.1.5.1 Dredging Safety Personnel Requirements

a. Provide a minimum of one full time collateral duty SSHO assigned per project site for the primary working shift.

b. For a project involving multiple work shifts, provide one Collateral Duty Safety Officer (CDSO) on a dredge and one at the dredged material placement site. During these shifts, the SSHO must be available at all times to assist with emergency situations.

c. For individual dredging projects or sites with a dredge crew and fill crew on watch of 8 employees or less, a CDSO must be appointed, instead

of an SSHO. The CDSO assumes the same responsibilities as a full-time SSHO.

d. An example of one dredging project site is reflected in each of the following:

(1) a mechanical dredge, tug(s) and scow(s), scow route, and material placement site; or

(2) a hydraulic pipeline dredge, attendant plant, and material placement site; or,

(3) a hopper dredge (include land-based material placement site - if applicable.)

e. For Hopper Dredges with the U.S. Coast Guard, documented crews may designate an officer as a Collateral Duty Safety Officer (CDSO) instead of having a full-time SSHO onboard if the officer meets the SSHO training and experience requirements.

1.7.1.5.2 SSHO Requirements for Dredging

a. In addition to requirements stated elsewhere in this specification, an individual serving as a SSHO must be present at the project site, located so that they have full mobility and reasonable access to all major work operations, for at least one shift in each 24 hour period when work is being performed. The SSHO must be available during their shift for immediate verbal consultation and notification, either by phone or radio.

b. The SSHO is a full-time, dedicated position, except as noted above, who must report to a senior project (or corporate) official. When the SSHO is permitted to be a collateral duty, the SSHO is not permitted to be in another position requiring continuous mechanical or equipment operations, such as equipment operators.

c. The SSHO must inspect all work areas and operations during initial set-up and at least monthly observe and provide personal oversight on each shift during dredging operations for projects with many work sites, more often for those with less work sites.

d. If the SSHO is off-site for a period longer than 24 hours, anotherqualified SSHO must be provided and fulfill the same roles and responsibilities as the SSHO during their absence.

1.7.1.5.3 Collateral Duty Safety Officer (CDSO) Requirements for Dredging

a. A CDSO is an individual who is assigned collateral duty safety responsibilities in addition to their full-time occupation, and who supports and supplements the SSHO efforts in managing, implementing and enforcing the Contractor's Safety and Health Program. The assigned CDSO must be an individual(s) with work oversight responsibilities, such as master, mate, fill foreman, or superintendent. A CDSO must not be an employee responsible for continuous mechanical or equipment operations, such as an equipment operator.

b. A CDSO performs safety program tasks as assigned by the SSHO and must report safety findings to the SSHO. The SSHO must document results of safety findings and provide information for inclusion in the CQC

reports to the Contracting Officer.

1.7.1.5.4 Safety Personnel Training Requirements for Dredging

A SSHO and a CDSO for dredging contracts must take either a formal classroom or online OSHA 30-hour Construction Safety Course, or an equivalent 30 hours of formal classroom or online safety and health training covering the subjects of the OSHA 30-hour Course in accordance with EM 385-1-1 Appendix A, paragraph 3.d.(3), applicable to dredging work, and given by qualified instructors. In exception to EM 385-1-1, Section 01.A.17, comply with the following:

a. The SSHO must maintain competency through having taken 8 hours of formal classroom or online safety and health related coursework every year. Hours spent as an instructor in such courses will be considered the same as attending them, but each course only gets credit once (for example, instructing a 1-hour asbestos awareness course 5 times in a year provides one hour credit for training).

b. The SSHO and a CDSO must have a minimum of three years of experience within the past five years in one of the following:

(1) Supervising/managing dredging activities

(2) Supervising/managing marine construction activities

(3) Supervising/managing land-based construction activities

(4) Work managing safety programs or processes

(5) Conducting hazard analyses and developing controls in activities or environments with similar hazards

1.7.1.6 Crane Operators/Riggers

Provide Operators meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

Crane Operators must also meet the crane operator requirements of the State of Hawaii for Crane certification.

1.7.2 Personnel Duties

1.7.2.1 Duties of the Site Safety and Health Officer (SSHO)

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 Contractors' daily production report.

b. Conduct mishap investigations and complete required accident reports.

Report mishaps and near misses.

c. Use OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors. Post and maintain the Form 300 on the site Safety Bulletin Board.

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

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.

k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If 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.

1.7.3 Meetings

1.7.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, 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).

b. 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 Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.

c. Deficiencies in the submitted APP, identified during the Contracting

Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin work until an APP is established that is acceptable to the Contracting Officer.

1.7.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.8 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their 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. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager.

Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. 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 Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.8.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of 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 of qualified persons. As a minimum, designate and submit qualifications of competent persons 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; and personal protective equipment and clothing to include selection, use and maintenance.

1.8.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.8.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, 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.)

1.8.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 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 conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.8.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

a. For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

b. For barge mounted mobile cranes, provide a Naval Architecture Analysis and include an LHE Manufacturer's Floating Service Load Chart in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L.02. The Floating Service Load Chart must provide a table of rated load versus boom angle and radius. The Floating Service Load Chart must also provide the maximum allowable machine list and trim associated with the tabular loads and radii provided. If the Manufacturer's Floating Service Load Chart is not available, a floating service load chart may be developed and provided by a qualified Registered Professional Engineer (RPE), competent in the field of floating cranes. The Load Chart must be in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L; provide a table of rated load versus boom angle and radius; provide the maximum allowable machine list and machine trim associated with the tabular loads and radii provided; and be stamped by a RPE qualified and competent in the field of floating cranes. The RPE, competent in the field of floating cranes must stamp and certify (sign) that the Naval Architectural Analysis (NAA) meets the requirements of EM 385-1-1, Section 16.L.03.

c. Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.8.2.4 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. 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 must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum 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 documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.8.2.5 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. 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.

1.8.2.6 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.8.2.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 31 00 00 EARTHWORK.

1.8.2.8 Occupant Protection Plan

Identify the safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 82 33.13 20 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD.

1.8.2.9 Lead Compliance Plan

Identify the safety and health aspects of lead work, and prepare in accordance with Section 02 83 13.00 20 LEAD IN CONSTRUCTION.

1.8.2.10 Asbestos Hazard Abatement Plan

Identify the safety and health aspects of asbestos work, and prepare in accordance with Section 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS.

1.8.2.11 Site Safety and Health Plan

Identify the safety and health aspects, and prepare in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

1.8.2.12 PCB Plan

Identify the safety and health aspects of Polychlorinated Biphenyls work, and prepare in accordance with Sections 02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs) and 02 61 23 REMOVAL AND DISPOSAL OF PCB CONTAMINATED SOILS.

1.8.2.13 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 DEMOLITION AND DECONSTRUCTION and referenced sources. Include engineering survey as applicable.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.9.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.9.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.10 DISPLAY OF SAFETY INFORMATION

1.10.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety 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 Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may 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 01.A.06. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.10.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.11 SITE SAFETY REFERENCE MATERIALS

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

1.12 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.13 NOTIFICATIONS and REPORTS

1.13.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, load handling equipment (LHE) or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

1.13.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable NAVFAC Contractor Incident Reporting System (CIRS), and electronically submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS). The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: For Navy Projects, complete the applicable documentation in NAVFAC Contractor Incident Reporting System (CIRS), and electronically submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS). Near miss reports are considered positive and proactive Contractor safety management actions.

c. Conduct an accident investigation for any load handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.13.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.13.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.13.5 Third Party Certification of Barge-Mounted Mobile Cranes

For project requiring barge cranes: Certify barge-mounted mobile cranes in accordance with 29 CFR 1919 by an OSHA accredited person.

1.14 HOT WORK

1.14.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Fire Division. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated

extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Division phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DIVISION IMMEDIATELY.

1.14.2 Work Around Flammable Materials

Obtain services from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.15 RADIATION SAFETY REQUIREMENTS

Submit License Certificates, employee training records, and Leak Test Reports for radiation materials and equipment to the Contracting Officer and Radiation Safety Office (RSO), and Contracting Oversight Technician (COT) for all specialized and licensed material and equipment proposed for use on the construction project. Maintain on-site records whenever licensed radiological materials or ionizing equipment are on government property.

Protect workers from radiation exposure in accordance with 10 CFR 20, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

1.15.1 Radiography Operation Planning Work Sheet

Submit a Radiography Operation Planning Work Sheet to Contracting Officer 14 days prior to commencement of operations involving radioactive materials or radiation generating devices. The Contracting Officer and COT will review this worksheet and submit questions and comments.

Contractors must use primary dosimeters process by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

1.15.2 Site Access and Security

Coordinate site access and security requirements with the Contracting Officer and COT for all radiological materials and equipment containing ionizing radiation that are proposed for use on a government facility. The Navy COT or authorized representative will meet the Contractor at a designated location, ensure safety of the materials being transported, and will escort the Contractor to the job site and return upon completion of the work.

Provide a copy of all calibration records, and utilization records to the COT for radiological operations performed on the site.

1.15.3 Loss or Release and Unplanned Personnel Exposure

Loss or release of radioactive materials, and unplanned personnel exposures must be reported immediately to the Contracting Officer, RSO, and Base Security Department Emergency Number.

1.15.4 Site Demarcation and Barricade

Properly demark and barricade an area surrounding radiological operations to preclude personnel entrance, in accordance with EM 385-1-1, Nuclear Regulatory Commission, and Applicable State regulations and license requirements, and in accordance with requirements established in the accepted Radiography Operation Planning Work Sheet.

Do not close or obstruct streets, walks, and other facilities occupied and used by the Government without written permission from the Contracting Officer.

1.15.5 Security of Material and Equipment

Properly secure the radiological material and ionizing radiation equipment at all times, including keeping the devices in a properly marked and locked container, and secondarily locking the container to a secure point in the Contractor's vehicle or other approved storage location during transportation and while not in use. While in use, maintain a continuous visual observation on the radiological material and ionizing radiation equipment. In instances where radiography is scheduled near or adjacent to buildings or areas having limited access or one-way doors, make no assumptions as to building occupancy. Where necessary, the Contracting Officer will direct the Contractor to conduct an actual building entry, search, and alert. Where removal of personnel from such a building cannot be accomplished and it is otherwise safe to proceed with the radiography, position a fully instructed employee inside the building or area to prevent exiting while external radiographic operations are in process.

1.15.6 Transportation of Material

Comply with 49 CFR 173 for Transportation of Regulated Amounts of Radioactive Material. Notify Local Fire authorities and the site Radiation Safety officer (RSO) of any Radioactive Material use.

1.15.7 Schedule for Exposure or Unshielding

Actual exposure of the radiographic film or unshielding the source must not be initiated until after 5 p.m. on weekdays.

1.15.8 Transmitter Requirements

Adhere to the base policy concerning the use of transmitters, such as radios and cell phones. Obey Emissions control (EMCON) restrictions.

1.16 CONFINED SPACE ENTRY REQUIREMENTS.

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive

CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used. Contractors entering and working in confined spaces while performing shipyard industry work are required to follow the requirements of OSHA 29 CFR 1915 Subpart B.

1.16.1 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. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.16.2 Forced Air Ventilation

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.

1.16.3 Sewer Wet Wells

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

1.16.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.17 DIVE SAFETY REQUIREMENTS

Develop a Dive Operations Plan, AHA, emergency management plan, and personnel list that includes qualifications, for each separate diving operation. Submit these documents to the District Dive Coordinator (DDC) for review and acceptance at least 15 working days prior to commencement of diving operations. These documents must be at the diving location at all times. Provide each of these documents as a part of the project file.

1.18 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

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

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

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

2.1 CONFINED SPACE SIGNAGE

Provide permanent signs integral to or securely attached to access covers

for new permit-required confined spaces. Signs for confined spaces must comply with NEMA Z535.2. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" in bold letters a minimum of one inch in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" must be red and readable from 5 feet.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Hard Hat

b. Long Pants

c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Use

Each hazardous material must receive approval from the Contracting Office or their designated representative prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

3.1.3 Hazardous Material Exclusions

Notwithstanding 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, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting

fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.4 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer 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 FAR 52.243-4, "Changes" and FAR 52.236-2, "Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 30 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

Contracting Officer will, at the Contractor's request, apply lockout/tagout tags and take other actions that, because of experience and knowledge, are known to be necessary to make the particular equipment safe to work on for government owned and operated systems.

No person, regardless of position or authority, shall operate any switch, valve, or equipment that has an official lockout/tagout tag attached to it, nor shall such tag be removed except as provided in this section. No person shall work on any energized equipment including, but not limited to activities such as erecting, installing, constructing, repairing, adjusting, inspecting, un-jamming, setting up, trouble shooting, testing, cleaning, dismantling, servicing and maintaining machines equipment of processes until an evaluation has been conducted identifying the energy source and the procedures which will be taken to ensure the safety of personnel.

When work is to be performed on electrical circuits, only qualified personnel shall perform work on electrical circuits.

No person shall work on any equipment that requires a lockout/tagout tag unless he, his immediate supervisor, project leader, or a subordinate has in his possession the stubs of the required lockout/tagout tags.

A supervisor who is required to enter an area protected by a lockout/tagout tag will be considered a member of the protected group provided he notifies the holder of the tag stub each time he enters and departs from the protected area.

Identification markings on building light and power distribution circuits shall not be relied on for established safe work conditions.

Before clearance will be given on any equipment other than electrical (generally referred to as mechanical apparatus), the apparatus, valves, or systems shall be secured in a passive condition with the appropriate vents, pins, and locks.

Pressurized or vacuum systems shall be vented to relieve differential pressure completely.

Vent valves shall be tagged open during the course of the work.

Where dangerous gas or fluid systems are involved, or in areas where the environment may be oxygen deficient, system or areas shall be purged, ventilated, or otherwise made safe prior to entry.

3.3.1 Tag Placement

Lockout/tagout tags shall be completed in accordance with the regulations printed on the back thereof and attached to any device which, if operated, could cause an unsafe condition to exist.

If more than one group is to work on any circuit or equipment, the employee in charge of each group shall have a separate set of lockout/tagout tags completed and properly attached.

When it is required that certain equipment be tagged, the Government will review the characteristics of the various systems involved that affect the safety of the operations and the work to be done; take the necessary actions, including voltage and pressure checks, grounding, and venting, to make the system and equipment safe to work on; and apply such lockout/tagout tags to those switches, valves, vents, or other mechanical devices needed to preserve the safety provided. This operation is referred to as "Providing Safety Clearance."

3.3.2 Tag Removal

When any individual or group has completed its part of the work and is clear of the circuits or equipment, the supervisor, project leader, or individual for whom the equipment was tagged shall turn in his signed lockout/tagout tag stub to the Contracting Officer. That group's or individual's lockout/tagout tags on equipment may then be removed on authorization by the Contracting Officer.

3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, 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 in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and 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, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M,ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.O through 21.O.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. 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. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 6 feet of an edge, on a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by use of personal fall arrest/restraint systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized. Provide in accordance with 29 CFR 1926.500.

(2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and EM 385-1-1, Section L.

b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:1 (vertical to horizontal) requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also applies to residential or housing type construction.

3.4.4 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Plan and 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 or assisted-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 Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.5 WORK PLATFORMS

3.5.1 Scaffolding

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. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable 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.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. 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 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. 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.

k. 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.

3.5.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the

operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

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

3.6.2 Load Handling Equipment (LHE)

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Prior to cranes entering federal activities, a Crane Access Permit must be obtained from the Contracting Officer. A copy of the permitting process will be provided at the Preconstruction Conference. Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

g. Do not use crane suspended personnel work platforms (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. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

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

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

j. Use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

m. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.6.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.6.4 USE OF EXPLOSIVES

Explosives must not be used or brought to the project site.

3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.7.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service.

3.7.2 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.

3.7.3 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 verified 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. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.8 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.8.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. 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 is 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

are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and 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. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.8.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State and Local requirements applicable to where work is being performed.

3.8.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.8.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.8.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

3.9 SAFETY APPAREL ON CONSTRUCTION JOBSITES

All personnel on construction jobsites shall wear high-visibility safety apparel (garment, vest, or harness of retro-reflective and fluorescent material) meeting ANSI/ISEA 107 2004 or later requirements. As a minimum, all personnel shall wear ANSI/ISEA 107 2004 Class I compliant apparel. When the risk level exceeds those of Class I, Class II or Class III safety apparel shall be worn.

All workers will be required to wear their hard hats with the bill facing forward. Ball caps, knit caps, or other headdress worn under the hard hat is prohibited unless approved by the hard hat manufacturer.

3.10 EMERGENCY BREATHING APPARATUS (EBA)/SELF-CONTAINING SELF RESCUER (SCSR)

All personnel entering the Red Hill tunnel and adits shall be equipped with Emergency Breathing Apparatus (EBA)/Self-Contained Self Rescuer (SCSR). This equipment shall be provided by the contractor for all personnel present in the tunnel due to performance of this contract. The EBA/SCSR shall be shoulder, back, or front carried and able to provide a user with over 60 minutes of oxygen in escape situations requiring heavy physical activity. The unit shall be designed and approved solely as an exit and escape device.

The contractor shall appoint in writing a competent person responsible for all aspects of EBA/SCSR usage on this contract. Prior to contract startup, the contractor shall submit a detailed EBA/SCSR plan prepared and approved by this competent person. Prior to entry, the competent person shall train and document all personnel on the usage of the EBA/SCSR requirements, including identification of escape routes (both primary and secondary) specific to each worker's assigned location in the facility.

-- End of Section --

SECTION 01 45 00.00 20

QUALITY CONTROL
11/11

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 in the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 52.2	(2012; Errata 2013; INT 1 2014; ADD A, B, AND D SUPP 2015; INT 3 2015; Errata 2 2015; ADD C 2015) Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size

ASTM INTERNATIONAL (ASTM)

ASTM D6245	(2012) Using Indoor Carbon Dioxide Concentrations to Evaluate Indoor Air Quality and Ventilation
ASTM D6345	(2010) Selection of Methods for Active, Integrative Sampling of Volatile Organic Compounds in Air

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

ANSI/SMACNA 008	(2007) IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES

SD-01 Preconstruction Submittals

Construction Quality Control (QC) Plan; G

Submit a Construction QC Plan prior to start of construction.

Indoor Air Quality (IAQ) Management Plan; G

Basis of Design and Design Intent

SD-05 Design Data

Design Review

Contract Document Review

SD-07 Certificates

CA Resume

1.3 INFORMATION FOR THE CONTRACTING OFFICER

Prior to commencing work on construction, the Contractor can obtain a single copy set of the current report forms from the Contracting Officer. The report forms will consist of the Contractor Production Report, Contractor Production Report (Continuation Sheet), Contractor Quality Control (CQC) Report, CQC Report (Continuation Sheet), Preparatory Phase Checklist, Initial Phase Checklist, Rework Items List, and Testing Plan and Log.

Deliver the following to the Contracting Officer during Construction:

a. CQC Report: Mail or hand-carry the original (wet signatures) and one copy by 10:00 AM the next working day after each day that work is performed and for every seven consecutive calendar days of no-work.

b. Contractor Production Report: Submit the report electronically by 10:00 AM the next working day after each day that work is performed and for every seven consecutive calendar days of no-work.

c. Preparatory Phase Checklist: Submit the report electronically in the same manner as the CQC Report for each Preparatory Phase held.

d. Initial Phase Checklist: Submit the report electronically in the same manner as the CQC Report for each Initial Phase held.

e. QC Specialist Reports: Submit the report electronically by 10:00 AM the next working day after each day that work is performed.

f. Field Test Reports: Within two working days after the test is performed, submit the report as an electronic attachment to the CQC Report.

g. Monthly Summary Report of Tests: Submit the report as an electronic attachment to the CQC Report at the end of each month.

h. Testing Plan and Log: Submit the report as an electronic attachment to the CQC Report, at the end of each month. Provide a copy of the final Testing Plan and Log to the OMSI preparer for inclusion into the OMSI documentation.

i. Rework Items List: Submit lists containing new entries daily, in the same manner as the CQC Report.

j. CQC Meeting Minutes: Within two working days after the meeting is

held, submit the report as an electronic attachment to the CQC Report.

k. QC Certifications: As required by the paragraph entitled "QC Certifications."

l. Special Inspection Report: Submit the Special Inspection reports, in the same manner as the CQC Report.

1.4 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. This QC program is a key element in meeting the objectives of NAVFAC Commissioning. The QC program consists of a QC Organization, QC Plan, QC Plan Meeting(s), a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, testing, independent Special Inspections in accordance with Section 01 45 35 SPECIAL INSPECTIONS, completion inspections, and QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this Contract. The QC program must cover on-site and off-site work and must be keyed to the work sequence. No construction work or testing may be performed unless the QC Manager is on the work site. The QC Manager must report to the Project Superintendent. The QC Manager, Project Superintendent and Project Manager must work together effectively. Although the QC Manager is the primary individual responsible for quality control, all individuals will be held responsible for the quality of work on the job.

1.4.1 Commissioning

Commissioning (Cx) is a systematic process of ensuring that all building systems meet the requirements and perform interactively according to the Contract. The QC Program is a key to this process by coordinating, verifying and documenting measures to achieve the following objectives:

a. Verify and document that the applicable equipment and systems are installed in accordance with the design intent as expressed through the Contract and according to the manufacturer's recommendations and industry accepted minimum standards.

b. Verify and document that equipment and systems receive complete operational checkout by the installing contractors.

c. Verify and document proper performance of equipment and systems.

d. Verify that Operation and Maintenance (O&M) documentation is complete.

e. Verify the Training Plan and training materials are accurate and provide correct instruction and documentation on the critical elements of the products, materials, and systems in the constructed facility. Verify that all identified Government operating personnel are trained.

f. Verify and document that all contract requirements for LEED fundamental commissioning are met.

1.4.2 Acceptance of the Construction Quality Control (QC) Plan

Acceptance of the QC Plan is required prior to the start of construction.

The Contracting Officer reserves the right to require changes in the QC Plan and operations as necessary, including removal of personnel, to ensure the specified quality of work. The Contracting Officer reserves the right to interview any member of the QC organization at any time in order to verify the submitted qualifications. All QC organization personnel are subject to acceptance by the Contracting Officer. The Contracting Officer may require the removal of any individual for non-compliance with quality requirements specified in the Contract.

1.4.3 Preliminary Construction Work Authorized Prior to Acceptance

The only construction work that is authorized to proceed prior to the acceptance of the QC Plan is mobilization of storage and office trailers, temporary utilities, and surveying.

1.4.4 Notification of Changes

Notify the Contracting Officer, in writing, of any proposed changes in the QC Plan or changes to the QC organization personnel, a minimum of 10 work days prior to a proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

1.4.5 Special Inspections

Perform all required Special Inspections per Section 01 45 35 SPECIAL INSPECTIONS, the statement of Special Inspections and the Schedule of Special Inspections.

1.5 QC ORGANIZATION

1.5.1 QC Manager

1.5.1.1 Duties

Provide a QC Manager at the work site to implement and manage the QC program. The only duties and responsibilities of the QC Manager are to manage and implement the QC program on this Contract. The QC Manager is required to attend the partnering meetings, QC Plan Meetings, Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control except for those phases of control designated to be performed by QC Specialists, perform submittal review and approval, ensure testing is performed and provide QC certifications and documentation required in this Contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by the QC Specialists, testing laboratory personnel and any other inspection and testing personnel required by this Contract. The QC Manager is the manager of all QC activities. The QC manager is responsible for notifying the Special InspectorSpecial Inspector of Record of activities which require their review. The QC manager is responsible for coordinating the Special Inspection activities, see paragraph QUALITY CONTROL MANAGER, in Section 01 45 35 SPECIAL INSPECTIONS.

1.5.1.2 Qualifications

An individual with a minimum of 5 years combined experience in the following positions: Project Superintendent, QC Manager, Project Manager, Project Engineer or Construction Manager on similar size and type

construction contracts which included the major trades that are part of this Contract. The individual must have at least two years experience as a QC Manager. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification, safety compliance, and sustainability.

NOTE: Include the following for large, complex projects above $15 million

A graduate of a four year accredited college or university program in one of the following disciplines: Engineering, Architecture, Construction Management, Engineering Technology, Building Construction, or Building Science, with a minimum of 10 years experience as a Project Superintendent, QC Manager, Project Manager, Project Engineer or Construction Manager on similar size and type construction contracts which included the major trades that are part of this Contract. The individual must have at least two years experience as a QC Manager. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification, safety compliance, and sustainability.

1.5.2 Commissioning Authority

1.5.2.1 Duties

Provide a Commissioning Authority (CA) as key person for the Cx and documentation thereof, who is subordinate to the QC Manager. The CA directs and coordinates Cx activities and submits Cx reports to the Contracting Officer to meet the submittal and reporting requirements ofCommissioning and develops the commissioning plan. The CA coordinates the actions of the QC Specialists, Testing Laboratory personnel, eOMSI Preparer, and other inspection and testing personnel required by this Contract for building Cx.

1.5.2.2 Qualifications

The CA must be certified as a commissioning professional by the Associated Air Balance Council (AABC) Commissioning Group (ACG), the Association of Energy Engineers (AEE), the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), the Commissioning Process Management Professional (CPMP), the Building Commissioning Association (BCA), the National Environmental Balancing Bureau (NEBB), or the University of Wisconsin - Madison (UWM). CA resume is required, providing education, experience and management capabilities on at least two similar size and type contracts. The CA may not have been involved with the project design, construction management, or supervision .

1.5.3 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager must have completed the course entitled "Construction Quality Management (CQM) for Contractors." If the QC Manager does not have a current certification, they must obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the Contracting Officer for information on the next scheduled class.

1.5.4 Alternate QC Manager Duties and Qualifications

Designate an alternate for the QC Manager at the work site to serve in the

event of the designated QC Manager's absence. The period of absence may not exceed two weeks at one time, and not more than 30 workdays during a calendar year. The qualification requirements for the Alternate QC Manager must be the same as for the QC Manager.

1.5.5 QC Specialists Duties and Qualifications

Provide a separate QC Specialist at the work site for each of the areas of responsibilities, specified in Part 3, Execution, of the technical sections, who must assist and report to the QC Manager and who must have no duties other than their assigned quality control duties. QC Specialists are required to attend the Coordination and Mutual Understanding Meeting, QC meetings and be physically present at the construction site to perform the three phases of control and prepare documentation for each definable feature of work in their area of responsibility.

Qualification/Experience in Area of Responsibility	Area of Responsibility	Frequency
Roofing Manufacturer's Technical Representative/five years minimum	Installation and testing of roofing systems, Section 07 53 23 ETHYLENE-PROPYLENE-DIENE-ROOFING	Full time
Mechanical Inspector, International Code Council (ICC) Certified/five years minimum	Installation and testing of boilers, Section 23 52 49.00 20 STEAM BOILERS AND EQUIPMENT (500,000 - 18,000,000 BTU/HR)	Minimum three times a week during installation and full time during testing
Registered Structural Engineer, (P.E.)	Erection of structural steel, Section 05 12 00 STRUCTURAL STEEL	Minimum twice a week

1.5.6 Special Inspector or Special Inspector of Record

NOTE: The Special Inspector of Record is required for the following project conditions:

1) Seismic Design Category D, E or F; and assigned to Risk Cat III, IV or V.
2) Seismic Design Category D, E or F; and with a height greater than 75 ft.
3) Seismic Design Category E, assigned to Risk Category I or II and the building is greater than two stories above grade plane.
4) Nominal design wind speed in excess of 110 mph; and assigned to Risk Cat II, IV or V.
5) Nominal design wind speed in excess of 110 mph; and with a heigh greater than 75 ft.

The Special Inspector (SI) or Special Inspector of Record (SIOR) must be an independent third party hired directly by the Prime Contractor. The SI or SIOR must not be a company employee of the Contractor or any Sub-Contractor performing the work to be inspected. The qualifications of the SI or SIOR are defined in Section 01 45 35 SPECIAL INSPECTION.

1.5.7 Registered Fire Protection Engineer

The U.S. Registered Fire Protection Engineer (FPE) must be an independent third party hired directly by the Prime Contractor as an integral part of the Prime Contractor's Quality Control Organization. This FPE must have no business relationships (owner, partner, operating officer, distributor, salesman, or technical representative) with any subcontractors involved with this project, or with any fire protection equipment device manufacturers, suppliers or installers for any such equipment provided as part of this project. This FPE is responsible for review, approval, and coordination of all fire protection system material submittals, calculations, shop drawings, etc.

1.5.8 Submittal Reviewers Duties and Qualifications

Provide Submittal Reviewers, other than the QC Manager or CA, qualified in the disciplines being reviewed, to review and certify that the submittals meet the requirements of this Contract prior to certification or approval by the QC Manager.

Each submittal must be reviewed by an individual with 10 years of construction experience.

NOTE: Include the following for large, complex projects above $25 million

Each submittal must be reviewed by a registered architect or professional engineer.

Each of the following submittals must be reviewed by individuals meeting the qualifications/experience specified below:

Qualification / Experience in Submittal Discipline	Submittals to be reviewed:	
	Section No	Submittal
Register Mechanical Engineer	Division 22 & 23	All
Registered Structural Fabrication Engineer, (P.E.)	Section 05 12 00 STRUCTURAL STEEL	Drawings Erection Plan
Certified Industrial Hygienist (CIH)/ Comprehensive practice with five years experience in asbestos	Section 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIAL	Asbestos Hazard Abatement Plan

1.5.9 QC Administrative Assistant

Provide an Administrative Assistant at the work site until the work has been accepted. The primary duty is to assist the QC Manager in processing and maintaining files for submittals, preparing and publishing reports and meeting minutes. After primary duties are accomplished, other duties may be assigned provided the duties do not interfere with primary duties.

1.5.10 Underwater QC Team

Provide Underwater QC (UWQC) Team at the work site to perform underwater surveillance and inspection for the Contractor. The UWQC Team divers must have current commercial diver's license, with a minimum of five (5) years experience with underwater inspection. The personnel make up of the UWQC team must comply with EM 385-1-1, OSHA and local requirements for Contract diving operations. Comply with all the applicable safety requirements of EM 385-1-1, OSHA and local requirements for Contract diving operations. The UWQC lead diver must be thoroughly familiar with the design plans and specifications to sufficiently understand the engineering aspects of the underwater construction and to be able to recognize and document potential problem areas such as improperly constructed or defective areas. Provide all necessary equipment to conduct surveillance and inspection services, including diver's equipment, dive boat, communication equipment, and photographic/video equipment. Diver(s) must be equipped to maintain two-way communication with QC personnel during diving operations. Prepare and submit a report including photographs and/or videos with the QC report after each dive. Frequency of underwater surveillance and inspection will be once during installation and including final inspection or as indicated in each task order. The UWQC Team must be an independent third party hired directly by the Prime Contractor, and must have no involvement with the design, preparation of Contract, or installation of work.

1.6 QUALITY CONTROL (QC) PLAN

1.6.1 Construction Quality Control (QC) Plan

1.6.1.1 Requirements

Provide, for acceptance by the Contracting Officer, a Construction QC Plan submitted in a three-ring binder that includes a table of contents, with major sections identified with tabs, with pages numbered sequentially, and that documents the proposed methods and responsibilities for accomplishing quality control commissioning activities during the construction of the project:

a. QC ORGANIZATION: A chart showing the QC organizational structure.

b. NAMES AND QUALIFICATIONS: Names and qualifications, in resume format, for each person in the QC organization. Include the CQM for Contractors course certifications for the QC Manager and Alternate QC Manager as required by the paragraphs entitled "Construction Quality Management Training" and "Alternate QC Manager Duties and Qualifications".

c. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONNEL: Duties, responsibilities, and authorities of each person in the QC organization.

d. OUTSIDE ORGANIZATIONS: A listing of outside organizations, such as architectural and consulting engineering firms, that will be employed by the Contractor and a description of the services these firms will provide.

e. APPOINTMENT LETTERS: Letters signed by an officer of the firm appointing the QC Manager and Alternate QC Manager and stating that they are responsible for implementing and managing the QC program as described in this Contract. Include in this letter the responsibility

of the QC Manager and Alternate QC Manager to implement and manage the three phases of control, and their authority to stop work which is not in compliance with the Contract. Letters of direction are to be issued by the QC Manager to all other QC Specialists outlining their duties, authorities, and responsibilities. Include copies of the letters in the QC Plan.

f. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER: Procedures for reviewing, approving, and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval. Provide the initial submittal of the Submittal Register as specified in Section 01 33 00 SUBMITTAL PROCEDURES.

g. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraphs entitled "Accreditation Requirements", as applicable.

h. TESTING PLAN AND LOG: A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test. Use Government forms to log and track tests.

i. PROCEDURES TO COMPLETE REWORK ITEMS: Procedures to identify, record, track, and complete rework items. Use Government forms to record and track rework items.

j. DOCUMENTATION PROCEDURES: Use Government form.

k. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task that is separate and distinct from other tasks and has control requirements and work crews unique to that task. A DFOW is identified by different trades or disciplines and is an item or activity on the construction schedule. Include in the list of DFOWs, but not be limited to, all critical path activities on the NAS. Include all activities for which this specification requires QC Specialists or specialty inspection personnel. Provide separate DFOWs in the Network Analysis Schedule for each design development stage and submittal package.

l. PROCEDURES FOR PERFORMING THE THREE PHASES OF CONTROL: Identify procedures used to ensure the three phases of control to manage the quality on this project. For each DFOW, a Preparatory and Initial phase checklist will be filled out during the Preparatory and Initial phase meetings. Conduct the Preparatory and Initial Phases and meetings with a view towards obtaining quality construction by planning ahead and identifying potential problems for each DFOW.

m. PERSONNEL MATRIX: Not Applicable

n. PROCEDURES FOR COMPLETION INSPECTION: Procedures for identifying and documenting the completion inspection process. Include in these procedures the responsible party for punch out inspection, pre-final inspection, and final acceptance inspection.

o. TRAINING PROCEDURES AND TRAINING LOG: Procedures for coordinating and documenting the training of personnel required by the Contract.

p. ORGANIZATION AND PERSONNEL CERTIFICATIONS LOG: Procedures for

coordinating, tracking and documenting all certifications on subcontractors, testing laboratories, suppliers, personnel, etc. QC Manager will ensure that certifications are current, appropriate for the work being performed, and will not lapse during any period of the contract that the work is being performed.

1.7 COORDINATION AND MUTUAL UNDERSTANDING MEETING

After submission of the QC Plan, and prior to Government approval and the start of construction, the QC Manager will meet with the Contracting Officer to present the QC program required by this Contract. When a new QC Manager is appointed, the coordination and mutual understanding meeting must be repeated.

1.7.1 Purpose

The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, design intent, Cx, environmental requirements and procedures, coordination of activities to be performed, Special Inspections, and the coordination of the Contractor's management, production, and QC personnel. At the meeting, the Contractor will be required to explain in detail how three phases of control will be implemented for each DFOW, as well as how each DFOW will be affected by each management plan or requirement as listed below:

a. Waste Management Plan.

b. IAQ Management Plan.

c. Procedures for noise and acoustics management.

d. Environmental Protection Plan.

e. Environmental regulatory requirements.

f. Cx Plan.

g. Special Inspections.

1.7.2 Coordination of Activities

Coordinate activities included in various sections to assure efficient and orderly installation of each component. Coordinate operations included under different sections that are dependent on each other for proper installation and operation. Schedule construction operations with consideration for indoor air quality as specified in the IAQ Management Plan. Coordinate prefunctional tests and startup testing with Cx. Coordinate special inspections.

1.7.3 Attendees

As a minimum, the Contractor's personnel required to attend include an officer of the firm, the Project Manager, Project Superintendent, QC Manager, Alternate QC Manager, QC Specialists, Special Inspector,Special Inspector of Record, CA, Environmental Manager, and subcontractor representatives. Each subcontractor who will be assigned QC responsibilities must have a principal of the firm at the meeting. Minutes of the meeting will be prepared by the QC Manager and signed by the

Contractor and the Contracting Officer. Provide a copy of the signed minutes to all attendees and include in the QC Plan.

1.8 QC MEETINGS

After the start of construction, conduct QC meetings once every two weeks by the QC Manager at the work site with the Project Superintendent. the QC Specialists, the Special Inspector, the Special Inspector of Record, the CA, and the foremen who are performing the work of the DFOWs. The QC Manager is to prepare the minutes of the meeting and provide a copy to the Contracting Officer within two working days after the meeting. The Contracting Officer may attend these meetings. As a minimum, accomplish the following at each meeting:

a. Review the minutes of the previous meeting.

b. Review the schedule and the status of work and rework.

c. Review the status of submittals.

d. Review the work to be accomplished in the next two weeks and documentation required.

e. Resolve QC and production problems (RFI, etc.).

f. Address items that may require revising the QC Plan.

g. Review Accident Prevention Plan (APP).

h. Review environmental requirements and procedures.

i. Review Waste Management Plan.

j. Review IAQ Management Plan.

k. Review Environmental Management Plan.

l. Review the status of training completion.

m. Review Cx Plan and progress.

1.9 DESIGN REVIEW AND DOCUMENTATION

1.9.1 Basis of Design and Design Intent

The CA must review the basis of design received from the Contracting Officer and the design intent. The Basis of Design is not part of the contract documents, but will be provided by the Contracting Officer upon request. Document the Basis of Design review in the Design Review report required below.

1.9.2 Design Review

The CA must review design documents to verify that each commissioned system meets the design intent relative to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. Fully document design review in written report.

1.9.3 Contract Document Review

The CA must review the Contract documents to verify that Cx is adequately specified, and that each commissioned system is likely to meet the design intent relative to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. Fully document contract document review in written report.

1.10 THREE PHASES OF CONTROL

Adequately cover both on-site and off-site work with the Three Phases of Control and include the following for each DFOW.

1.10.1 Preparatory Phase

Notify the Contracting Officer at least two work days in advance of each preparatory phase meeting. The meeting will be conducted by the QC Manager and attended by the QC Specialists, the Project Superintendent, the CA, the Special Inspector, the Special Inspector of Record, and the foreman responsible for the DFOW. When the DFOW will be accomplished by a subcontractor, that subcontractor's foreman must attend the preparatory phase meeting. Document the results of the preparatory phase actions in the daily Contractor Quality Control Report and in the Preparatory Phase Checklist. Perform the following prior to beginning work on each DFOW:

a. Review each paragraph of the applicable specification sections.

b. Review the Contract drawings.

c. Verify that field measurements are as indicated on construction and/or shop drawings before confirming product orders, in order to minimize waste due to excessive materials.

d. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required.

e. Review the testing plan and ensure that provisions have been made to provide the required QC testing.

f. Review special inspections required by Section 01 45 35 SPECIAL INSPECTION, the statement of special inspections and the schedule of special inspections.

g. Examine the work area to ensure that the required preliminary work has been completed.

h. Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

i. Arrange for the return of shipping/packaging materials, such as wood pallets, where economically feasible.

j. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data and are properly stored.

k. Discuss specific controls used and construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFOW.

l. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted.

m. Review the Cx Plan and ensure all preliminary work items have been completed and documented.

1.10.2 Initial Phase

Notify the Contracting Officer at least two work days in advance of each initial phase. When construction crews are ready to start work on a DFOW, conduct the initial phase with the QC Specialists, the Project Superintendent, the Special Inspector, the Special Inspector of Record,and the foreman responsible for that DFOW. Observe the initial segment of the DFOW to ensure that the work complies with Contract requirements. Document the results of the initial phase in the daily CQC Report and in the Initial Phase Checklist. Repeat the initial phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each DFOW:

a. Establish level of workmanship and verify that it meets the minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

b. Resolve any workmanship issues.

c. Ensure that testing is performed by the approved laboratory.

d. Check work procedures for compliance with the APP and the appropriate AHA to ensure that applicable safety requirements are met.

e. Review project specific work plans (i.e. Cx, HAZMAT Abeatement, Stormwater Management) to ensure all preparatory work items have been completed and documented.

f. Coordinate scheduled work with special inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the statement of special inspections and the schedule of special inspections.

1.10.3 Follow-Up Phase

Perform the following for on-going work daily, or more frequently as necessary, until the completion of each DFOW and document in the daily CQC Report:

a. Ensure the work is in compliance with Contract requirements.

b. Maintain the quality of workmanship required.

c. Ensure that testing is performed by the approved laboratory.

d. Ensure that rework items are being corrected.

e. Assure manufacturers representatives have performed necessary

inspections if required and perform safety inspections.

f. Review the Cx Plan and ensure all work items, testing, and documentation has been completed.

g. Coordinate scheduled work with special inspections required by Section 01 45 35 SPECIAL INSPECTIONS, the statement of special inspections and the schedule of special inspections.

1.10.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same DFOW if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if work on a DFOW is resumed after substantial period of inactivity, or if other problems develop.

1.10.5 Notification of Three Phases of Control for Off-Site Work

Notify the Contracting Officer at least two weeks prior to the start of the preparatory and initial phases.

1.11 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review and approval of submittals are described in Section 01 33 00 SUBMITTAL PROCEDURES.

1.12 TESTING

Except as stated otherwise in the specification sections, perform sampling and testing required under this Contract.

1.12.1 Accreditation Requirements

Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation. The laboratory's scope of accreditation must include the appropriate ASTM standards (E 329, C 1077, D 3666, D 3740, A 880, E 543) listed in the technical sections of the specifications. Laboratories engaged in Hazardous Materials Testing must meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the Corporate Office.

1.12.2 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology at http://ts.nist.gov/ts/htdocs/210/214/214.htm , the American Association of State Highway and Transportation Officials (AASHTO) program at http://www.amrl.net/amrlsitefinity/default/aap.aspx , International Accreditation Services, Inc. (IAS) at http://www.iasonline.org, U. S. Army Corps of Engineers Materials Testing Center (MTC) at http://gsl.erdc.usace.army.mil/SL/MTC/, the American Association for Laboratory Accreditation (A2LA) program at http://www.a2la.org/, the Washington Association of Building Officials (WABO) at http://www.wabo.org/ (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL)

at http://wacel.org/fmi/xsl/wacel/index.xsl (Approval authority by WACEL is limited to projects within Facilities Engineering Command (FEC) Washington geographical area).

1.12.3 Capability Check

The Contracting Officer retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in this Contract.

1.12.4 Test Results

Cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the Contracting Officer immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results must be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the signed reports, certifications, and other documentation to the Contracting Officer via the QC Manager. Furnish a summary report of field tests at the end of each month, in accordance with paragraph INFORMATION FOR THE CONTRACTING OFFICER.

1.12.5 Test Reports and Monthly Summary Report of Tests

Furnish the signed reports, certifications, and a summary report of field tests at the end of each month to the Contracting Officer. Attach a copy of the summary report to the last daily Contractor Quality Control Report of each month. Provide a copy of the signed test reports and certifications to the OMSI preparer for inclusion into the OMSI documentation.

1.13 QC CERTIFICATIONS

1.13.1 CQC Report Certification

Contain the following statement within the CQC Report: "On behalf of the Contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge, except as noted in this report."

1.13.2 Invoice Certification

Furnish a certificate to the Contracting Officer with each payment request, signed by the QC Manager, attesting that as-built drawings are current, coordinated and attesting that the work for which payment is requested, including stored material, is in compliance with Contract requirements.

1.13.3 Completion Certification

Upon completion of work under this Contract, the QC Manager must furnish a certificate to the Contracting Officer attesting that "the work has been completed, inspected, tested and is in compliance with the Contract." Provide a copy of this final QC Certification for completion to the OMSI preparer for inclusion into the OMSI documentation.

1.14 COMPLETION INSPECTIONS

1.14.1 Punch-Out Inspection

Near the completion of all work or any increment thereof, established by a completion time stated in the Contract Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager and the CA must conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings, specifications and Contract. Include in the punch list any remaining items on the "Rework Items List", which were not corrected prior to the Punch-Out Inspection. Include within the punch list the estimated date by which the deficiencies will be corrected. Provide a copy of the punch list to the Contracting Officer. The QC Manager, or staff, must make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government "Pre-Final Inspection".

1.14.2 Pre-Final Inspection

The Government and QCM will perform this inspection to verify that the facility is complete and ready to be occupied. A Government "Pre-Final Punch List" will be documented by the CQM as a result of this inspection. The QC Manager will ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the Client can be scheduled. Any items noted on the "Pre-Final" inspection must be corrected in a timely manner and be accomplished before the contract completion date for the work,or any particular increment thereof, if the project is divided into increments by separate completion dates.

1.14.3 Final Acceptance Inspection

Notify the Contracting Officer at least 14 calendar days prior to the date a final acceptance inspection can be held. State within the notice that all items previously identified on the pre-final punch list will be corrected and acceptable, along with any other unfinished Contract work, by the date of the final acceptance inspection. The Contractor must be represented by the QC Manager, the Project Superintendent, the CA, and others deemed necessary. Attendees for the Government will include the Contracting Officer, other FEAD/ROICC personnel, and personnel representing the Client. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract Clause entitled "Inspection of Construction."

1.15 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities.

1.15.1 Construction Documentation

Reports are required for each day that work is performed and must be attached to the Contractor Quality Control Report prepared for the same day. Maintain current and complete records of on-site and off-site QC program operations and activities. The forms identified under the paragraph "INFORMATION FOR THE CONTRACTING OFFICER" will be used. Reports are required for each day work is performed. Account for each calendar day

throughout the life of the Contract. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The Project Superintendent and the QC Manager must prepare and sign the Contractor Production and CQC Reports, respectively. The reporting of work must be identified by terminology consistent with the construction schedule. In the "remarks" sections of the reports, enter pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site, quality control problem areas, deviations from the QC Plan, construction deficiencies encountered, meetings held. For each entry in the report(s), identify the Schedule Activity No. that is associated with the entered remark.

1.15.2 Quality Control Validation

Establish and maintain the following in a series of three ring binders. Binders must be divided and tabbed as shown below. These binders must be readily available to the Contracting Officer during all business hours.

a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.

b. All milestone inspections, arranged by Activity Number.

c. An up-to-date copy of the Testing Plan and Log with supporting field test reports, arranged by specification section.

d. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.

e. An up-to-date copy of the Rework Items List.

f. Maintain up-to-date copies of all punch lists issued by the QC staff to the Contractor and Sub-Contractors and all punch lists issued by the Government.

g. Commissioning documentation including Cx checklists, schedules, tests, and reports.

h. Special inspection reports.

1.15.3 Reports from the QC Specialist(s)

Reports are required for each day that work is performed in their area of responsibility. QC Specialist reports must include the same documentation requirements as the CQC Report for their area of responsibility. QC Specialist reports are to be prepared, signed and dated by the QC Specialists and must be attached to the CQC Report prepared for the same day.

1.15.4 Testing Plan and Log

As tests are performed, the CA and the QC Manager will record on the "Testing Plan and Log" the date the test was performed and the date the test results were forwarded to the Contracting Officer. Attach a copy of the updated "Testing Plan and Log" to the last daily CQC Report of each month, per the paragraph "INFORMATION FOR THE CONTRACTING OFFICER".

Provide a copy of the final "Testing Plan and Log" to the OMSI preparer for inclusion into the OMSI documentation.

1.15.5 Rework Items List

The QC Manager must maintain a list of work that does not comply with the Contract, identifying what items need to be reworked, the date the item was originally discovered, the date the item will be corrected by, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered. Attach a copy of the "Rework Items List" to the last daily CQC Report of each month. The Contractor is responsible for including those items identified by the Contracting Officer.

1.15.6 As-Built Drawings

The QC Manager is required to ensure the as-built drawings, required by Section 01 78 00 CLOSEOUT SUBMITTALS are kept current on a daily basis and marked to show deviations which have been made from the Contract drawings. Ensure each deviation has been identified with the appropriate modifying documentation (e.g. PC No., Modification No., Request for Information No., etc.). The QC Manager or QC Specialist assigned to an area of responsibility must initial each revision. Upon completion of work, the QC Manager will furnish a certificate attesting to the accuracy of the as-built drawings prior to submission to the Contracting Officer.

1.16 NOTIFICATION ON NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected non-compliance with the Contract. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, is deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time for excess costs or damages by the Contractor.

1.17 CONSTRUCTION INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN

Submit an IAQ Management Plan within 15 days after Contract award and not less than 10 days before the preconstruction meeting. Revise and resubmit Plan as required by the Contracting Officer. Make copies of the final plan available to all workers on site. Include provisions in the Plan to meet the requirements specified below and to ensure safe, healthy air for construction workers and building occupants.

1.17.1 Requirements During Construction

Provide for evaluation of indoor Carbon Dioxide concentrations in accordance with ASTM D6245. Provide for evaluation of volatile organic compounds (VOCs) in indoor air in accordance with ASTM D6345. Use filters with a Minimum Efficiency Reporting Value (MERV) of 8 in permanently installed air handlers during construction.

1.17.1.1 Control Measures

Meet or exceed the requirements of ANSI/SMACNA 008, Chapter 3, to help minimize contamination of the building from construction activities. The

five requirements of this manual which must be adhered to are described below:

a. HVAC protection: Isolate return side of HVAC system from surrounding environment to prevent construction dust and debris from entering the duct work and spaces.

b. Source control: Use low emitting paints and other finishes, sealants, adhesives, and other materials as specified. When available, cleaning products must have a low VOC content and be non-toxic to minimize building contamination. Utilize cleaning techniques that minimize dust generation. Cycle equipment off when not needed. Prohibit idling motor vehicles where emissions could be drawn into building. Designate receiving/storage areas for incoming material that minimize IAQ impacts.

c. Pathway interruption: When pollutants are generated use strategies such as 100 percent outside air ventilation or erection of physical barriers between work and non-work areas to prevent contamination.

d. Housekeeping: Clean frequently to remove construction dust and debris. Promptly clean up spills. Remove accumulated water and keep work areas dry to discourage the growth of mold and bacteria. Take extra measures when hazardous materials are involved.

e. Scheduling: Control the sequence of construction to minimize the absorption of VOCs by other building materials.

1.17.1.2 Moisture Contamination

a. Remove accumulated water and keep work dry.

b. Use dehumidification to remove moist, humid air from a work area.

c. Do not use combustion heaters or generators inside the building.

d. Protect porous materials from exposure to moisture.

e. Remove and replace items which remain damp for more than a few hours.

1.17.2 Requirements after Construction

After construction ends and prior to occupancy, conduct a building flush-out or test the indoor air contaminant levels. Flush-out must be a minimum two-weeks with MERV-13 filtration media as determined by ASHRAE 52.2 at 100 percent outside air. Air contamination testing must be consistent with EPA's current Compendium of Methods for the Determination of Air Pollutants in Indoor Air. After building flush-out or testing and prior to occupancy, replace filtration media. Filtration media must have a MERV of 13 as determined by ASHRAE 52.2.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PREPARATION

Designate receiving/storage areas for incoming material to be delivered

according to installation schedule and to be placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. Store and handle materials in a manner as to prevent loss from weather and other damage. Keep materials, products, and accessories covered and off the ground, and store in a dry, secure area. Prevent contact with material that may cause corrosion, discoloration, or staining. Protect all materials and installations from damage by the activities of other trades.

-- End of Section --

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
08/09

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 WATER WORKS ASSOCIATION (AWWA)

AWWA C511	(2007) Standard for Reduced-Pressure Principle Backflow Prevention Assembly

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR List	(continuously updated) List of Approved Backflow Prevention Assemblies
FCCCHR Manual	(10th Edition) Manual of Cross-Connection Control

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2013) Standard for Safeguarding Construction,Alteration, and Demolition Operations
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013) National Electrical Code

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1	(2007; Rev K) Obstruction Marking and Lighting

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009) Manual on Uniform Traffic Control Devices

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

Traffic control plan; G

SD-06 Test Reports

Backflow Preventer Tests; G

SD-07 Certificates

Backflow Tester Certification; G

Backflow Preventers Certificate of Full Approval

1.3 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.3.1 Backflow Tester Certificate

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the regulatory agency. Tester must not be affiliated with any company participating in any other phase of this Contract.

1.3.2 Backflow Prevention Training Certificate

Submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

1.4 HURRICANE CONDITION OF READINESS

Unless directed otherwise, comply with:

a. Condition FOUR (Sustained winds of 50 knots or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove all debris, trash, or objects that could become missile hazards. Contact Contracting Officer for Condition Requirements.

b. Condition THREE (Sustained winds of 50 knots or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness. Contact Contracting Officer for weather and COR updates and completion of required actions.

c. Condition TWO (Sustained winds of 50 knots or greater expected within 24 hours): Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact Contracting Officer for weather and Condition of Readiness (COR) updates and completion of required actions.

d. Condition ONE. (Sustained winds of 50 knots or greater expected within 12 hours): Secure the jobsite, and leave Government premises.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

2.1.1 Bulletin Board

Immediately upon beginning of work, provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer.

2.1.2 Project and Safety Signs

The requirements for the signs, their content, and location are as specified in Section 01 58 00 PROJECT IDENTIFICATION.. Erect signs within 15 days after receipt of the notice to proceed. Correct the data required by the safety sign daily, with light colored metallic or non-metallic numerals.

2.2 TEMPORARY TRAFFIC CONTROL

2.2.1 Haul Roads

Construct access and haul roads necessary for proper prosecution of the work under this contract. Construct with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic are be avoided. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, must be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads are subject to approval by the Contracting Officer. Lighting must be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations.

2.2.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic barricades will be required. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.2.3 Fencing

Provide fencing along the construction site at all open excavations and tunnels to control access by unauthorized people.

a. The safety fencing must be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. Install fencing to be able to restrain a force of at least 250 pounds against it.

2.2.4 Temporary Wiring

Provide temporary wiring in accordance with NFPA 241 and NFPA 70. Include frequent inspection of all equipment and apparatus.

2.2.5 Backflow Preventers

Reduced pressure principle type conforming to the applicable requirements AWWA C511. Provide backflow preventers complete with 150 pound flanged cast iron, bronze or brass mounted gate valve and strainer, 304 stainless steel or bronze, internal parts. The particular make, model/design, and size of backflow preventers to be installed must be included in the latest edition of the List of Approved Backflow Prevention Assemblies issued by the FCCCHR List and be accompanied by a Certificate of Full Approval from FCCCHR List. After installation conduct Backflow Preventer Tests and provide test reports verifying that the installation meets the FCCCHR Manual Standards. After installation, NAVFAC Hawaii Water Utilities shall test and certify backflow preventer. If the temporary water connection needs to be moved to another location during construction, the Contractor shall notify the Contracting Officer in writing a minimum of 5 working days prior to movement. The relocated backflow preventer shall be re-tested and re-certified by NAVFAC Hawaii Water Utilities.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Contractor employees will park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Contractor employee parking must not interfere with existing and established parking requirements of the government installation.

3.2 AVAILABILITY AND USE OF UTILITY SERVICES

3.2.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.2.2 Payment for Utility Services

a. The Government will make all reasonably required utilities available to the Contractor from existing outlets and supplies, as specified in the

contract. Unless otherwise provided in the contract, the amount of each utility service consumed will be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. Carefully conserve any utilities furnished without charge.

b. Reasonable amounts of the following utilities will be made available to the Contractor at the prevailing rates.

Utility Services		
	Cost ($) per	Unit
Electricity	Prevailing Rate	
Potable Water	Prevailing Rate	
Sanitary Sewer	Prevailing Rate	

c. The point at which the Government will deliver such utilities or services and the quantity available is as indicated. Pay all costs incurred in connecting, converting, and transferring the utilities to the work. Make connections, including providing backflow-preventing devices on connections to domestic water lines; providing meters; and providing transformers; and make disconnections.

3.2.3 Meters and Temporary Connections

At the Contractors expense and in a manner satisfactory to the Contracting Officer, provide and maintain necessary temporary connections, distribution lines, and meter bases (Government will provide meters) required to measure the amount of each utility used for the purpose of determining charges. Notify the Contracting Officer, in writing, 5 working days before final electrical connection is desired so that a utilities contract can be established. The Government will provide a meter and make the final hot connection after inspection and approval of the Contractor's temporary wiring installation. The Contractor will not make the final electrical connection.

3.2.4 Advance Deposit

An advance deposit for utilities consisting of an estimated month's usage or a minimum of $50.00 will be required. The last monthly bills for the fiscal year will normally be offset by the deposit and adjustments will be billed or returned as appropriate. Services to be rendered for the next fiscal year, beginning 1 October, will require a new deposit. Notification of the due date for this deposit will be mailed to the Contractor prior to the end of the current fiscal year.

3.2.5 Final Meter Reading

Before completion of the work and final acceptance of the work by the Government, notify the Contracting Officer, in writing, 5 working days before termination is desired. The Government will take a final meter reading, disconnect service, and remove the meters. Then remove all the temporary distribution lines, meter bases, and associated paraphernalia. Pay all outstanding utility bills before final acceptance of the work by the Government.

3.2.6 Sanitation

a. Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system. Any penalties and / or fines associated with improper discharge will be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Maintain these conveniences at all times without nuisance. Include provisions for pest control and elimination of odors. Government toilet facilities will not be available to Contractor's personnel.

3.2.7 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.2.8 Obstruction Lighting of Cranes

Provide a minimum of 2 aviation red or high intensity white obstruction lights on temporary structures (including cranes) over 100 feet above ground level. Light construction and installation must comply with FAA AC 70/7460-1. Lights must be operational during periods of reduced visibility, darkness, and as directed by the Contracting Officer.

3.2.9 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials daily to minimize potential hazards.

3.3 TRAFFIC PROVISIONS

3.3.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close any thoroughfare or interfere in any way with traffic on railways or highways except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan must be in accordance with State and local regulations and the MUTCD, Part VI. Make all notifications and obtain any permits required for modification to traffic movements outside Station's jurisdiction.. Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.

b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.

c. Provide, erect, and maintain, at contractors expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

3.3.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of any damage to roads caused by construction operations.

3.3.3 Rush Hour Restrictions

Do not interfere with the peak traffic flows preceding and during normal operations without notification to and approval by the Contracting Officer.

3.3.4 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Treat dust abatement on access roads with applications of calcium chloride, water sprinklers, or similar methods or treatment.

3.4 CONTRACTOR'S TEMPORARY FACILITIES

Contractor-owned or -leased trailers must be identified by Government assigned numbers. Apply the number to the trailer within 14 calendar days of notification, or sooner, if directed by the Government.

3.4.1 Safety

Protect the integrity of any installed safety systems or personnel safety devices. If entrance into systems serving safety devices is required, the Contractor must obtain prior approval from the Contracting Officer. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the Contracting Officer.

3.4.2 Administrative Field Offices

Provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

3.4.3 Storage Area

Construct a temporary 6 foot high chain link fence around trailers and materials. Include plastic strip inserts, colored brown, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Do not place or store Trailers, materials, or equipment outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the installation boundaries. Trailers,

equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on any given day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the fenced area at the end of each work day.

3.4.4 Supplemental Storage Area

Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but will be within the installation boundaries. Fencing of materials or equipment will not be required at this site; however, the Contractor is responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area by the Government.

3.4.5 Appearance of Trailers

a. Trailers utilized by the Contractor for administrative or material storage purposes must present a clean and neat exterior appearance and be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on installation property.

b. Paint using suitable paint and maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

3.4.6 Maintenance of Storage Area

a. Keep fencing in a state of good repair and proper alignment. Grassed or unpaved areas, which are not established roadways, will be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways, should the Contractor elect to traverse them with construction equipment or other vehicles; gravel gradation will be at the Contractor's discretion. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers will be edged or trimmed neatly.

3.4.7 New Building

In the event a new building is constructed for the temporary project field office, it will be a minimum 12 feet in width, 16 feet in length and have a minimum of 7 feet headroom. Equip the building with approved electrical wiring, at least one double convenience outlet and the required switches and fuses to provide 110-120 volt power. Provide a work table with stool, desk with chair, two additional chairs, and one legal size file cabinet that can be locked. The building must be waterproof, supplied with a heater, have a minimum of two doors, electric lights, a telephone, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation, and a supply of approved drinking water. Approved sanitary facilities must be furnished. Screen the windows and doors and provide the doors with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge

pins will be non-removable. Arrange the windows to open and to be securely fastened from the inside. Protect glass panels in windows by bars or heavy mesh screens to prevent easy access. In warm weather, furnish air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 20 degrees F below the outside temperature when the outside temperature is 95 degrees F. Any new building erected for a temporary field office must be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work become the property of the Contractor and removed from the site.

3.4.8 Security Provisions

Provide adequate outside security lighting at the Contractor's temporary facilities. The Contractor will be responsible for the security of its own equipment; in addition, the Contractor will notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

3.4.9 Storage Size and Location

The open site available for storage must be as indicated. square feet.

3.4.10 Storage in Existing Buildings

The Contractor will be working in or around existing buildings; the storage of material where indicated. Provide 8 foot high security fence with a lockable gate around the storage area. Remove at the completion of work.

3.4.11 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

3.4.11.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions must include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

3.5 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing at the work site. Maintain the safety fencing during the life of the contract and, upon completion and acceptance of the work, will become the property of the Contractor and be removed from the work site.

3.6 CLEANUP

Remove construction debris, waste materials, packaging material and the

like from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away. Store any salvageable materials resulting from demolition activities within the fenced area described above or at the supplemental storage area. Neatly stack stored materials not in trailers, whether new or salvaged.

3.7 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, haul roads, and any other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence that will become the property of the Contractor. Restore areas used by the Contractor for the storage of equipment or material, or other use to the original or better condition. Remove gravel used to traverse grassed areas and restore the area to its original condition, including top soil and seeding as necessary.

-- End of Section --

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS
11/15

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.

STATE OF HAWAII, DEPARTMENT OF HEALTH (DOH), CLEAN WATER BRANCH (CWB), HAWAII ADMINISTRATIVE RULES (HAR)

DOH HAR 11-55	Water Pollution Control

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846	(Third Edition; Update IV) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

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

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 261.7	Residues of Hazardous Waste in Empty Containers
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 262.31	Standards Applicable to Generators of Hazardous Waste-Labeling
40 CFR 262.34	Standards Applicable to Generators of Hazardous Waste-Accumulation Time
40 CFR 263	Standards Applicable to Transporters of

	Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards For Universal Waste Management
40 CFR 273.2	Standards for Universal Waste Management - Batteries
40 CFR 273.4	Standards for Universal Waste Management - Mercury Containing Equipment
40 CFR 273.5	Standards for Universal Waste Management - Lamps
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 355	Emergency Planning and Notification
40 CFR 403	General Pretreatment Regulations for Existing and New Sources of Pollution
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 64	Compliance Assurance Monitoring
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
40 CFR 761	Polychlorinated Biphenyls (PCBs)

	Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 172.101	Hazardous Material Regulation-Purpose and Use of Hazardous Material Table
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Class I and II Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act. A list of Class I ODS can be found on the EPA website at the following weblink. http://www.epa.gov/ozone/science/ods/classone.html.

Class II ODS is defined in Section 602(s) of The Clean Air Act. A list of Class II ODS can be found on the EPA website at the following weblink. http://www.epa.gov/ozone/science/ods/classtwo.html.

1.2.2 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.2.3 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.2.4 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.2.5 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The

control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.6 Hazardous Debris

As defined in paragraph SOLID WASTE, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that: Is regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.120; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.2.8 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibit a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D.

1.2.9 Land Application

Land Application means spreading or spraying discharge water at a rate that allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Comply with federal, state, and local laws and regulations.

1.2.10 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by installations to obtain NPDES permit coverage for their stormwater discharges.

1.2.11 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.2.12 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, POLs and may be appropriately tested and discarded in a manner which is in compliance with other state and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, perform a hazardous waste determination prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.13 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.2.14 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.15 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.2.15.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.2.15.2 Green Waste

Green waste is the vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not

included.

1.2.15.3 Material not regulated as solid waste

Material not regulated as solid waste is nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.2.15.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 263.

1.2.15.5 Recyclables

Recyclables are materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable, wiring, insulated/non-insulated copper wire cable, wire rope, and structural components. It also includes commercial-grade refrigeration equipment with Freon removed, household appliances where the basic material content is metal, clean polyethylene terephthalate bottles, cooking oil, used fuel oil, textiles, high-grade paper products and corrugated cardboard, stackable pallets in good condition, clean crating material, and clean rubber/vehicle tires. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans that meet the definition of empty containers in accordance with 40 CFR 261.7 may be included as recyclable if sold to a scrap metal company.

1.2.15.6 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

Excess soil generated from construction projects on Navy Region Hawaii Property is not to be given to the Contractor. Excess soil shall disposed of at a permitted landfill that can accept the soil. The Contractor is responsible for performing all required sampling to meet the requirements of the permitted landfill.

If the need exist for reuse of excess soil on government DOD property, the contractor will be notified of such need. With the consent of the DoD property owner and NAVFAC HI Environmental Department, EV4, the contractor may turn over excess soil to the government at a location specified by the contracting officer. Only soil with no known or suspected contaminates, stains or odor shall be reused on DoD property.

The contractor must not assume that the goverment will accept excess soil. The contractor is responsible for all costs associated with sampling, testing and disposing of all excess soils.

1.2.15.7 Scrap Metal

This includes scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe, and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

1.2.15.8 Wood

Wood is dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included. Treated wood includes, but is not limited to, lumber, utility poles, crossties, and other wood products with chemical treatment.

1.2.16 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, creeks or "waters of the United States". Surface discharges are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.2.17 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.2.17.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.2.18 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.2.19 Wetlands

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.2.20 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (for example, thermostats), and lamps (for example, fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Survey

Solid Waste Management Permit; G

Regulatory Notifications; G

Environmental Protection Plan; G

Stormwater Notice of Intent (for NPDES coverage under the general permit for construction activities); G

NPDES Permit Application (for individual permit for construction activities)

Dirt and Dust Control Plan; G

Employee Training Records; G

Environmental Manager Qualifications; G

SD-06 Test Reports

Laboratory Analysis

Inspection Reports

Solid Waste Management Report; G

SD-07 Certificates

Employee Training Records; G

ECATTS Certificate Of Completion; G

Erosion and Sediment Control Inspector Qualifications

SD-11 Closeout Submittals

Stormwater Pollution Prevention Plan Compliance Notebook; G

Stormwater Notice of Cessation (for NPDES coverage under the general permit for construction activities); G

Waste Determination Documentation; G

Disposal Documentation for Hazardous and Regulated Waste; G

Assembled Employee Training Records; G

Solid Waste Management Permit; G

Solid Waste Management Report; G

Contractor Hazardous Material Inventory Log; G

Hazardous Waste/Debris Management; G

Regulatory Notifications; G

Sales Documentation; G

Contractor Certification (when sales documentation is not available)

As-Built Topographic Survey

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.4.1 Training in Environmental Compliance Assessment Training and Tracking System (ECATTS)

1.4.1.1 Personnel Requirements

The Environmental Manager is responsible for environmental compliance on projects. The Environmental Manager and other staff, must complete applicable ECATTS training modules (installation specific or general) prior to starting respective portions of on-site work under this Contract. If personnel changes occur for any of these positions after starting work, replacement personnel must complete applicable ECATTS training within 14 days of assignment to the project.

1.4.1.2 Certification

Submit an ECATTS certificate of completion for personnel who have completed the required ECATTS training. This training is web-based and can be accessed from any computer with Internet access using the following instructions.

Register for NAVFAC Environmental Compliance Training and Tracking System, by logging on to https://environmentaltraining.ecatts.com/. Obtain the

password for registration from the Contracting Officer.

1.4.1.3 Refresher Training

This training has been structured to allow contractor personnel to receive credit under this contract and to carry forward credit to future contracts. Ensure the Environmental Manager review their training plans for new modules or updated training requirements prior to beginning work. Some training modules are tailored for specific state regulatory requirements; therefore, Contractors working in multiple states will be required to retake modules tailored to the state where the contract work is being performed.

1.4.2 Conformance with the Environmental Management System

Perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). Perform work in a manner that conforms to objectives and targets of the environmental programs and operational controls identified by the EMS. Support Government personnel when environmental compliance and EMS audits are conducted by escorting auditors at the Project site, answering questions, and providing proof of records being maintained. Provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, take corrective and preventative actions. In addition, employees must be aware of their roles and responsibilities under the installation EMS and of how these EMS roles and responsibilities affect work performed under the contract.

Coordinate with the installation's EMS coordinator to identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. Provide training documentation to the Contracting Officer. The Installation Environmental Office will retain associated environmental compliance records. Make EMS Awareness training completion certificates available to Government auditors during EMS audits and include the certificates in the Employee Training Records. See paragraph EMPLOYEE TRAINING RECORDS.

1.5 SPECIAL ENVIRONMENTAL REQUIREMENTS

Comply with the special environmental requirements listed in each task order.

1.6 QUALITY ASSURANCE

1.6.1 Preconstruction Survey and Protection of Features

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s),

as applicable. The Contractor and the Contracting Officer will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.6.2 Regulatory Notifications

Provide regulatory notification requirements in accordance with federal, state and local regulations. In cases where the Government will also provide public notification (such as stormwater permitting), coordinate with the Contracting Officer. Submit copies of regulatory notifications to the Contracting Officer within 15 days prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all-inclusive): demolition, renovation, NPDES defined site work, construction, removal or use of a permitted air emissions source, and remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.6.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the installation; and types and quantities of wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and installation Environmental Office to discuss the proposed Environmental Protection Plan (EPP). Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.6.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager is directly responsible for coordinating contractor compliance with federal, state, local, and installation requirements. The Environmental Manager must ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the EPP; ensure environmental permits are obtained, maintained, and closed out; ensure compliance with Stormwater Program requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however, the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out. Submit Environmental Manager Qualifications to the Contracting Officer.

1.6.5 Employee Training Records

Prepare and maintain Employee Training Records throughout the term of the

contract meeting applicable 40 CFR requirements. Provide Employee Training Records in the Environmental Records Binder. Ensure every employee completes a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures compliance with federal, state and local regulatory requirements for RCRA Large Quantity Generator. Provide a Position Description for each employee, by subcontractor, based on the Davis-Bacon Wage Rate designation or other equivalent method, evaluating the employee's association with hazardous and regulated wastes. This Position Description will include training requirements as defined in 40 CFR 265 for a Large Quantity Generator facility. Submit these Assembled Employee Training Records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

Train personnel to meet state requirements. Conduct environmental protection/pollution control meetings for personnel prior to commencing construction activities. Contact additional meetings for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, waters of the United States, and endangered species and their habitat that are known to be in the area.

1.6.6 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.7 ENVIRONMENTAL PROTECTION PLAN

The purpose of the EPP is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Incorporate construction related objectives and targets from the installation's EMS into the EPP. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer or Contracting Officer Representative to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Submit the EPP within 15 days after Contract award and not less than 10 days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations.

During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.7.1 General Overview and Purpose

1.7.1.1 Descriptions

A brief description of each specific plan required by environmental permit or elsewhere in this Contract such as stormwater pollution prevention plan, spill control plan, solid waste management plan, wastewater management plan, air pollution control plan, contaminant prevention plan, a historical, archaeological, cultural resources, biological resources and wetlands plan, traffic control plan Hazardous, Toxic and Radioactive Waste (HTRW) Plan, Non-Hazardous Solid Waste Disposal Plan, borrowing material plan, or any other plan required per task order.

1.7.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.7.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.7.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.7.1.5 Contact Information

Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

1.7.2 General Site Information

1.7.2.1 Drawings

Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, jurisdictional wetlands, material storage areas, structures, sanitary facilities, storm drains and conveyances, and stockpiles of excess soil.

1.7.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for

marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

1.7.2.3 Documentation

A letter signed by an officer of the firm appointing the Environmental Manager and stating that person is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

1.7.3 Management of Natural Resources

a. Land resources

b. Tree protection

c. Replacement of damaged landscape features

d. Temporary construction

e. Stream crossings

f. Fish and wildlife resources

g. Wetland areas

1.7.4 Protection of Historical and Archaeological Resources

a. Objectives

b. Methods

1.7.5 Stormwater Management and Control

a. Ground cover

b. Erodible soils

c. Temporary measures

(1) Structural Practices

(2) Temporary and permanent stabilization

d. Effective selection, implementation and maintenance of Best Management Practices (BMPs).

1.7.6 Protection of the Environment from Waste Derived from Contractor Operations

Control and disposal of solid and sanitary waste. Control and disposal of hazardous waste.

This item consist of the management procedures for hazardous waste to be generated. The elements of those procedures will coincide with the Installation Hazardous Waste Management Plan. The Contracting Officer will provide a copy of the Installation Hazardous Waste Management Plan. As a

minimum, include the following:

a. List of the types of hazardous wastes expected to be generated

b. Procedures to ensure a written waste determination is made for appropriate wastes that are to be generated

c. Sampling/analysis plan, including laboratory method(s) that will be used for waste determinations and copies of relevant laboratory certifications

d. Methods and proposed locations for hazardous waste accumulation/storage (that is, in tanks or containers)

e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted)

f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)

g. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar

h. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures

i. Plans for the disposal of hazardous waste by permitted facilities; and Procedures to be employed to ensure required employee training records are maintained.

1.7.7 Prevention of Releases to the Environment

Procedures to prevent releases to the environment

Notifications in the event of a release to the environment

1.7.8 Regulatory Notification and Permits

List what notifications and permit applications must be made. Some permits require up to 180 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

1.7.9 Clean Air Act Compliance

1.7.9.1 Haul Route

Submit truck and material haul routes along with a Dirt and Dust Control Plan for controlling dirt, debris, and dust on Installation roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

1.7.9.2 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Determine requirements based on any current installation permits and the impacts of

the project. Provide a list of all fixed or mobile equipment, machinery or operations that could generate air emissions during the project to the Installation Environmental Office (Air Program Manager).

1.7.9.3 Stationary Internal Combustion Engines

Identify portable and stationary internal combustion engines that will be supplied, used or serviced. Comply with 40 CFR 60 Subpart IIII, 40 CFR 60 Subpart JJJJ, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine brake horsepower), and EPA emission certification status of each engine. Maintain applicable records and log hours of operation and fuel use. Logs must include reasons for operation and delineate between emergency and non-emergency operation.

1.7.9.4 Refrigerants

Identify management practices to ensure that heating, ventilation, and air conditioning (HVAC) work involving refrigerants complies with 40 CFR 82 requirements. Technicians must be certified, maintain copies of certification on site, use certified equipment and log work that requires the addition or removal of refrigerant. Any refrigerant reclaimed is the property of the Government, coordinate with the Installation Environmental Office to determine the appropriate turn in location.

1.7.9.5 Air Pollution-engineering Processes

Identify planned air pollution-generating processes and management control measures (including, but not limited to, spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions). Log hours of operations and track quantities of materials used.

1.7.9.6 Compliant Materials

Provide the Government a list of and SDSs for all hazardous materials proposed for use on site. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements. The Government may alter or limit use of specific materials as needed to meet installation permit requirements for emissions.

1.8 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7. Notify the Government of all general use permitted equipment the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7.

See the task order for permits, if any, that have been or will be obtained by the Government.

1.9 ENVIRONMENTAL RECORDS BINDER

Maintain on-site a separate three-ring Environmental Records Binder and submit at the completion of the project. Make separate parts within the binder that correspond to each submittal listed under paragraph CLOSEOUT SUBMITTALS in this section.

1.10 SOLID WASTE MANAGEMENT PERMIT

Provide the Contracting Officer with written notification of the quantity of anticipated solid waste or debris that is anticipated or estimated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance from the receiving location or as applicable; submit one copy of the receiving location state and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

1.10.1 Solid Waste Management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

1.11 FACILITY HAZARDOUS WASTE GENERATOR STATUS

Joint Base Pearl Harbor Hickam and Marine Corp Base Hawaii are designated as a Large Quantity Generator. Meet the regulatory requirements of this generator designation for any work conducted within the boundaries of this Installation. Comply with provisions of federal, state, and local regulatory requirements applicable to this generator status regarding training and storage, handling, and disposal of construction derived wastes.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult with the Installation Environmental Office, regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of the Installation Environmental Office or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.1.2 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do

not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer and Installation Environmental Office to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.1.3 Streams

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with any required permits including, but not limited to, Clean Water Act Section 404, and Section 401 Water Quality.

The Contracting Officer's approval and appropriate permits are required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.2 STORMWATER

Do not discharge stormwater from construction sites to the sanitary sewer. If the water is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization in advance from the Installation Environmental Office for any release of contaminated water.

3.2.1 NPDES Permit Coverage for Construction Storm Water

The contractor is responsible for compliance with National Pollutant Discharge Elimination System permit(s) as required by the State of Hawaii Department of Health Clean Water Branch's (DOH-CWB's) requirements and DOH HAR 11-55.

If the project involves any land disturbance (regardless of acreage), the contractor must contact the Installation Environmental Office to determine whether NPDES Notice of Intent (for general permit) or Permit Application (for individual permit) coverage is required. If the Government determines that NPDES permit coverage is required, the Contractor shall prepare the Notice of Intent (NOI) or Permit Application and all required attachments, for coverage under the State of Hawaii's general NPDES permit or Individual Permit in accordance with Hawaii Administrative Rules, HAR 11-55, Appendix C - NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activities or conditions contained in the issued individual permit, and State of Hawaii guidelines. If non-storm water (e.g., construction dewatering, hydrotesting/ disinfecting water, well drilling process wastewater, etc.) will be discharged into the storm drainage system or a water body, the Contractor must prepare an NOI and all required attachments, for coverage under the appropriate State general NPDES

permit(s) in accordance with HAR 11-55.

Under the terms and conditions of the permit, install, inspect, maintain BMPs, prepare and submit SWPPP inspection reports. Maintain construction operations and management in compliance with the terms and conditions of the general or individual permit (as applicable) for stormwater discharges from construction activities.

3.2.1.1 Stormwater Pollution Prevention Plan

Submit a project-specific Stormwater Pollution Prevention Plan (SWPPP) to the Contracting Officer for approval with the NOI or Application described below. The SWPPP must meet the requirements of DOH-CWB HAR 11-55 or conditions contained in the issued individual permit for stormwater discharges from construction sites.

Include the following:

a. Comply with terms of the State's general or individual permit for discharge of stormwater associated with construction activities. Prepare SWPPP in accordance with State requirements. Use the DOH-CWB website for additional guidence: http://health.hawaii.gov/cwb

b. Select applicable BMPs from EPA Fact Sheets located at http://water.epa.gov/polwaste/npdes/swbmp/Construction-Site-StormWater-Run-Off-Control.cfm or in accordance with applicable state or local requirements.

3.2.1.2 Stormwater Notice of Intent and NPDES Permit Application for Construction Activities

Prepare and submit a Notice of Intent for NPDES coverage under the State of Hawaii's NPDES general permit authorizing discharges of storm water associated with contruction activity (HAR 11-55, Appendix C) or Permit Application for individual NPDES permit for discharges of storm water associated with construction activity in accordance with HAR 11-55 and State of Hawaii guidelines to the Contracting Officer for review and approval.

For JBPHH projects, the contractor must submit the contractor prepared Storm Water Notice of Intent or Permit Application package (including the Storm Water Pollution Prevention Plan (SWPPP) and draft on-line e-Permitting submittal) and filing fees for government review a minimum of 210 calendar days for general permit applications and a minimum 270 calendar days for individual permit applications prior to start of the permitted activity. The Contractor is responsible for responding to comments from the Government and the State DOH-CWB. The Government will submit the complete NOI or Application package to DOH-CWB. Upon permit issuance from the DOH-CWB, the Government, as permit holder, will coordinate all issues pertaining to the permit(s) with the State DOH-CWB. The Contractor shall not begin any land disturbing activities or discharges of non-storm water until coverage under the appropriate permit has been issued by DOH-CWB and erosion controls and other BMPs have been implemented.

For MCBH projects, the contractor must submit the contractor prepared Storm Water Notice of Intent or Permit Application (for NPDES coverage under the permit for construction activities) and Storm Water Pollution Prevention Plan (SWPPP) for the project to the MCBH Environmental Office for review. The Contractor is responsible for responding to comments from the

Government. When all comments from the Government have been resolved, the Contractor will submit the completed NOI or Application package(s) (including the Storm Water Pollution Prevention Plan (SWPPP) and draft on-line e-Permitting submittal) and filing fees to State of Hawaii DOH-CWB for review and approval. The Contractor shall work directly with State DOH-CWB for all issues pertaining to the permit, until permit is approved and issued by State DOH-CWB.

For Individual permits, the Contractor shall also be responsible for coordinating and paying for the required notice for the 30-day public review period for individual NPDES permit(s). The Contractor is responsible for responding to comments from the Government.

No land disturbing activities may commence without permit coverage. Maintain an approved copy of the SWPPP at the onsite construction office, and continually update as regulations require, reflecting current site conditions.

Comply with the additional requirements in Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS.

3.2.1.3 Inspection Reports

Submit "Inspection Reports" to the Contracting Officer in accordance with the State of HawaiiConstruction General Permit. Provide Inspection Reports in accordance with 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS.

3.2.1.4 Stormwater Pollution Prevention Plan Compliance Notebook

Create and maintain a three ring binder of documents that demonstrate compliance with the NPDES permit. Include a copy of the permit Notice of Intent or NPDES permit application, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports and related corrective action records, other permit-required reports and records, and copies of permit-related correspondence. At project completion, the notebook becomes property of the Government. Provide the compliance notebook to the Contracting Officer.

3.2.1.5 Stormwater Notice of Cessation for Construction Activities

Submit a Notice of Cessation to the Contracting Officer for approval once construction is complete and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Respond to any comments from the Government. Once approved, the Government shall certify the Notice of Cessation for submittal to the HDOH-CWB, by the contractor.

3.2.2 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

Erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports.

3.2.2.1 Erosion Control

Prevent erosion by mulching, Compost Blankets, Geotextiles, temporary slope drains, or as defined by each task order. Stabilize slopes by chemical stabilization, sodding, seeding, or such combination of these methods necessary for effective erosion control. Use of hay bales is prohibited.

Provide seeding in accordance with Section 32 92 19 SEEDING.

3.2.2.2 Sediment Control Practices

Implement sediment control practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Implement sediment control practices prior to soil disturbance and prior to creating areas with concentrated flow, during the construction process to minimize erosion and sediment laden runoff. Include devices such as silt fences, temporary diversion dikes, storm drain inlet protection, or any other approved method to maximize control of sediment runoff. Location and details of installation and construction are indicated on the drawings.

3.2.3 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area that are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. Personnel must be knowledgeable of the purpose for marking and protecting particular objects.

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Move or relocate the Contractor facilities only when approved by the Government. Provide erosion and sediment controls for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant or work areas to protect adjacent areas.

3.2.5 Municipal Separate Storm Sewer System (MS4) Management

Comply with the Installation's MS4 permit requirements.

3.3 SURFACE AND GROUNDWATER

3.3.1 Cofferdams, Diversions, and Dewatering

Construction operations for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure must be constantly controlled to maintain compliance with existing state water quality standards and designated uses of the surface water body. Comply with the State of Hawaii Clean Water Branch water quality standards and anti-degradation provisions and the Clean Water Act Section 404, Nation Wide Permits applicable to the task order. Do not discharge excavation ground water to the sanitary sewer, storm drains, or to surface waters without prior specific authorization in writing from the Installation Environmental Office. Discharge of hazardous substances will not be permitted under any circumstances. Use sediment

control BMPs to prevent construction site runoff from directly entering any storm drain or surface waters.

If the construction dewatering is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization for any contaminated groundwater release in advance from the Installation Environmental Officer and the federal or state authority, as applicable. Discharge of hazardous substances will not be permitted under any circumstances.

3.3.2 Waters of the United States

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States except as authorized within each task order. The protection of waters of the United States shown on the drawings in accordance with paragraph LICENSES AND PERMITS is the Contractor's responsibility. Authorization to enter specific waters of the United States identified does not relieve the Contractor from any obligation to protect other waters of the United States within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 PROTECTION OF CULTURAL RESOURCES

3.4.1 Archaeological Resources

Existing archaeological resources within the work area are shown on the drawings. Protect these resources and be responsible for their preservation during the life of the Contract. If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include, but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

3.4.2 Historical Resources

Existing historical resources within the work area are shown on the drawings. Protect these resources and be responsible for their preservation during the life of the Contract.

3.5 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with 40 CFR 64 and state air emission and performance laws and standards.

3.5.1 Preconstruction Air Permits

Notify the Air Program Manager, through the Contracting Officer, at least 6 months prior to bringing equipment, assembled or unassembled, onto the

Installation, so that air permits can be secured. Necessary permitting time must be considered in regard to construction activities. Clean Air Act (CAA) permits must be obtained prior to bringing equipment, assembled or unassembled, onto the Installation.

Confirm that these permits have been obtained.

3.5.2 Oil or Dual-fuel Boilers and Furnaces

Provide product data and details for new, replacement, or relocated fuel fired boilers, heaters, or furnaces to the Installation Environmental Office (Air Program Manager) through the Contracting Officer. Data to be reported include: equipment purpose (water heater, building heat, process), manufacturer, model number, serial number, fuel type (oil type, gas type) size (MMBTU heat input). Provide in accordance with paragraph PRECONSTRUCTION AIR PERMITS.

3.5.3 Burning

Burning is prohibited on the Government premises.

3.5.4 Class I and II ODS Prohibition

Class I and II ODS are Government property and must be returned to the Government for appropriate management. Coordinate with the Installation Environmental Office to determine the appropriate location for turn in of all reclaimed refrigerant.

3.5.5 Accidental Venting of Refrigerant

Accidental venting of a refrigerant is a release and must be reported immediately to the Contracting Officer.

3.5.6 EPA Certification Requirements

Heating and air conditioning technicians must be certified through an EPA-approved program. Maintain copies of certifications at the employees' places of business; technicians must carry certification wallet cards, as provided by environmental law.

3.5.7 Dust Control

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.5.7.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities, and processing and preparation of materials (such as from asphaltic batch plants) must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or

outside the project boundaries free from particulates that would exceed 40 CFR 50, state, and local air pollution standards or that would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.5.7.2 Abrasive Blasting

Blasting operations cannot be performed without prior approval of the Installation Air Program Manager. The use of silica sand is prohibited in sandblasting.

Provide tarpaulin drop cloths and windscreens to enclose abrasive blasting operations to confine and collect dust, abrasive agent, paint chips, and other debris. Perform work involving removal of hazardous material in accordance with 29 CFR 1910.

3.5.8 Odors

Control odors from construction activities. The odors must be in compliance with state regulations and local ordinances and may not constitute a health hazard.

3.6 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Obtain a copy of the installation's Pollution Prevention/Hazardous Waste Minimization Plan for reference material when preparing this part of the EPP. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information.

3.6.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, all scrap metal must be sent for reuse or recycling and will not be disposed of in a landfill.

Include the name, physical address, and telephone number of the hauler, if transported by a franchised solid waste hauler. Include the destination and, unless exempted, provide a copy of the state or local permit (cover) or license for recycling.

3.6.2 Nonhazardous Solid Waste Diversion Report

Maintain an inventory of nonhazardous solid waste diversion and disposal of construction and demolition debris. Submit a report to NAVFAC Hawaii, EV4 through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that nonhazardous solid waste has been generated. Include the following in the report:

Construction and Demolition (C&D) Debris Disposed	cubic yards, tons, cubic meters as appropriate
C&D Debris Recycled	cubic yards, tons, cubic meters as appropriate
Total C&D Debris Generated	cubic yards, tons, cubic meters as appropriate
Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount)	cubic yards, tons, cubic meters as appropriate

3.7 WASTE MANAGEMENT AND DISPOSAL

3.7.1 Waste Determination Documentation

Complete a Waste Determination form (provided at the pre-construction conference) for Contractor-derived wastes to be generated. All potentially hazardous solid waste streams that are not subject to a specific exclusion or exemption from the hazardous waste regulations (e.g. scrap metal, domestic sewage) or subject to special rules, (lead-acid batteries and precious metals) must be characterized in accordance with the requirements of 40 CFR 261 or corresponding applicable state or local regulations. Base waste determination on user knowledge of the processes and materials used, and analytical data when necessary. Consult with the Installation environmental staff for guidance on specific requirements. Attach support documentation to the Waste Determination form. As a minimum, provide a Waste Determination form for the following waste (this listing is not inclusive): oil- and latex -based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and containers of the original materials.

3.7.1.1 Sampling and Analysis of Waste

3.7.1.1.1 Waste Sampling

Sample waste in accordance with EPA SW-846. Clearly mark each sampled drum or container with the Contractor's identification number, and cross reference to the chemical analysis performed.

3.7.1.1.2 Laboratory Analysis

Follow the analytical procedure and methods in accordance with the 40 CFR 261. Provide analytical results and reports performed to the Contracting Officer.

3.7.1.1.3 Analysis Type

Identify hazardous waste by analyzing for the following characteristics: ignitability, corrosivity, reactivity, toxicity based on TCLP results.

3.7.2 Solid Waste Management

3.7.2.1 Solid Waste Management Report

Provide copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, a statement indicating the disposal location for the solid waste that is signed by an employee authorized to legally obligate or bind the firm may be submitted. The sales documentation (or Contractor certification when sales documentation is not available) must include the receiver's tax identification number and business, EPA or state registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained for the Contractor's own use, submit the information previously described in this paragraph on the solid waste disposal report. Prices paid or received do not have to be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.7.2.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with non-hazardous solid waste. Transport solid waste off Government property and dispose of it in compliance with 40 CFR 260, state, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill is the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Where allowable under each task order, haul waste materials to the Government landfill site as shown on the drawings or as designated by the Contracting Officer. Comply with site procedures. Segregate and separate treated wood components disposed at a lined landfill approved to accept this waste in accordance with local and state regulations Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, in accordance with 49 CFR 173.

3.7.3 Control and Management of Hazardous Waste

Do not dispose of hazardous waste on Government property. Do not discharge any waste to a sanitary sewer, storm drain, or to surface waters or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer.

3.7.3.1 Hazardous Waste/Debris Management

Identify construction activities that will generate hazardous waste or debris. Provide a documented waste determination for resultant waste streams. Identify, label, handle, store, and dispose of hazardous waste or debris in accordance with federal, state, and local regulations, including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Manage hazardous waste in accordance with the approved Hazardous Waste Management Section of the EPP. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities is identified as being generated by the Government. Prior to removal of any hazardous waste from Government property, hazardous waste manifests must be signed by personnel from the Installation Environmental Office. Do not bring hazardous waste onto Government property. Provide the Contracting Officer with a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D.

3.7.3.2 Waste Storage/Satellite Accumulation/90 Day Storage Areas

Accumulate hazardous waste at satellite accumulation points and in compliance with 40 CFR 262.34 and applicable state or local regulations. Individual waste streams will be limited to 55 gallons of accumulation (or 1 quart for acutely hazardous wastes). If the Contractor expects to generate hazardous waste at a rate and quantity that makes satellite accumulation impractical, the Contractor may request a temporary 90 day accumulation point be established. Submit a request in writing to the Contracting Officer and provide the following information (Attach Site Plan to the Request):

Contract Number	
Contractor	
Haz/Waste or Regulated Waste POC	
Phone Number	
Type of Waste	
Source of Waste	
Emergency POC	
Phone Number	
Location of the Site	

Attach a Waste Determination form for the expected waste streams. Allow 10 working days for processing this request. Additional compliance requirements (e.g. training and contingency planning) that may be required are the responsibility of the Contractor. Barricade the designated area where waste is being stored and post a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.7.3.3 Hazardous Waste Disposal

3.7.3.3.1 Responsibilities for Contractor's Disposal

Provide hazardous waste manifest to the Installations Environmental Office for review, approval, and signature prior to shipping waste off Government property.

3.7.3.3.1.1 Services

Provide service necessary for the final treatment or disposal of the hazardous material or waste in accordance with 40 CFR 260, local, and state, laws and regulations, and the terms and conditions of the Contract within 60 days after the materials have been generated. These services include necessary personnel, labor, transportation, packaging, detailed analysis (if required for disposal or transportation, include manifesting or complete waste profile sheets, equipment, and compile documentation).

3.7.3.3.1.2 Samples

Obtain a representative sample of the material generated for each job done to provide waste stream determination.

3.7.3.3.1.3 Analysis

Analyze each sample taken and provide analytical results to the Contracting Officer. See paragraph WASTE DETERMINATION DOCUMENTATION.

3.7.3.3.1.4 Labeling

Determine the Department of Transportation's (DOT's) proper shipping names for waste (each container requiring disposal) and demonstrate to the Contracting Officer how this determination is developed and supported by the sampling and analysis requirements contained herein. Label all containers of hazardous waste with the words "Hazardous Waste" or other words to describe the contents of the container in accordance with 40 CFR 262.31 and applicable state or local regulations.

3.7.3.3.2 Contractor Disposal Turn-In Requirements

Hazardous waste generated must be disposed of in accordance with the following conditions to meet installation requirements:

a. Drums must be compatible with waste contents and drums must meet DOT requirements for 49 CFR 173 for transportation of materials.

b. Band drums to wooden pallets.

c. No more than three 55 gallon drums or two 85 gallon over packs are to be banded to a pallet.

d. Band using 1-1/4 inch minimum band on upper third of drum.

e. Provide label in accordance with 49 CFR 172.101.

f. Leave 3 to 5 inches of empty space above volume of material.

3.7.3.4 Universal Waste Management

Manage the following categories of universal waste in accordance with federal, state, and local requirements and installation instructions:

a. Batteries as described in 40 CFR 273.2

b. Lamps as described in 40 CFR 273.5

c. Mercury-containing equipment as described in 40 CFR 273.4

d. Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS

Mercury is prohibited in the construction of this facility, unless specified otherwise, and with the exception of mercury vapor lamps and fluorescent lamps. Dumping of mercury-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited. Remove without breaking, pack to prevent breakage, and transport out of the activity in an unbroken condition for disposal as directed.

3.7.3.5 Electronics End-of-Life Management

Recycle or dispose of electronics waste, including, but not limited to, used electronic devices such computers, monitors, hard-copy devices, televisions, mobile devices, in accordance with 40 CFR 260-262, state, and local requirements, and installation instructions.

3.7.3.6 Disposal Documentation for Hazardous and Regulated Waste

Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or state permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifests must be reviewed, signed, and approved by the Contracting Officer before the Contractor may ship waste. To obtain specific disposal instructions, coordinate with the Installation Environmental Office. Refer to Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS for the Installation Point of Contact information.

3.7.4 Releases/Spills of Oil and Hazardous Substances

3.7.4.1 Response and Notifications

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Installation Fire Department, the Installation Command Duty Officer, the Installation Environmental Office, the Contracting Officer and the state or local authority.

Submit verbal and written notifications as required by the federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 days. Spill response must be in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills without cost to the Government.

3.7.4.2 Clean Up

Clean up hazardous and non-hazardous waste spills. Reimburse the Government for costs incurred including sample analysis materials,

clothing, equipment, and labor if the Government will initiate its own spill cleanup procedures, for Contractor- responsible spills, when: Spill cleanup procedures have not begun within one hour of spill discovery/occurrence; or, in the Government's judgment, spill cleanup is inadequate and the spill remains a threat to human health or the environment.

3.7.5 Mercury Materials

Immediately report to the Environmental Office and the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Do not recycle a mercury spill cleanup; manage it as a hazardous waste for disposal.

3.7.6 Wastewater

3.7.6.1 Disposal of wastewater must be as specified below.

3.7.6.1.1 Treatment

Do not allow wastewater from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, and forms to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction- related waste water off-Government property in accordance with 40 CFR 403, state, regional, and local laws and regulations.

3.7.6.1.2 Surface Discharge

For discharge of ground water, obtain a state or federal permit specific for pumping and discharging ground water prior to surface discharging. Surface discharge in accordance with federal, state, and local laws and regulations. Surface discharge in accordance with the requirements of the NPDES or state STORMWATER DISCHARGES FROM CONSTRUCTION SITES permit.

3.7.6.1.3 Land Application

Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing be land-applied in accordance with federal, state, and local laws and regulations for land application. Discharge of these waters is not permitted into the Navy’s wastewater collection system

3.8 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan, in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto Government property that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the installation. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have

National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261.

3.8.1 Contractor Hazardous Material Inventory Log

Submit the "Contractor Hazardous Material Inventory Log"(found at: http://www.wbdg.org/ccb/NAVGRAPH/graphtoc.pdf), which provides information required by (EPCRA Sections 312 and 313) along with corresponding SDS, to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Keep copies of the SDSs for hazardous materials onsite. At the end of the project, provide the Contracting Officer with copies of the SDSs, and the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used.

The Contracting Officer may request documentation for any spills or releases, environmental reports, or off-site transfers.

3.9 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.10 CONTROL AND MANAGEMENT OF ASBESTOS-CONTAINING MATERIAL (ACM)

Manage and dispose of asbestos-containing waste in accordance with 40 CFR 61. Refer to Section 02 82 13.00 10 ASBESTOS ABATEMENT IN SCHOOLS (K-12) BUILDINGSSection 02 82 16.00 20 ASBESTOS ABATEMENT IN NON-SCHOOL (K-12) BUILDING. Manifest asbestos-containing waste and provide the manifest to the Contracting Officer. Notifications to the state and Installation Air Program Manager are required before starting any asbestos work.

3.11 CONTROL AND MANAGEMENT OF LEAD-BASED PAINT (LBP)

Manage and dispose of lead-contaminated waste in accordance with 40 CFR 745 and Section 02 82 33.13 20 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD; Section 02 83 13.00 20 LEAD IN CONSTRUCTION; Section 02 83 19.00 10 LEAD BASED PAINT HAZARD ABATEMENT, TARGET HOUSING AND CHILD OCCUPIED FACILITIES. Manifest any lead-contaminated waste and provide the manifest to the Contracting Officer.

3.12 CONTROL AND MANAGEMENT OF POLYCHLORINATED BIPHENYLS (PCBS)

Manage and dispose of PCB-contaminated waste in accordance with 40 CFR 761 and Section 02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBS).

3.13 CONTROL AND MANAGEMENT OF LIGHTING BALLAST AND LAMPS CONTAINING PCBS

Manage and dispose of contaminated waste in accordance with 40 CFR 761. Refer to Section 02 84 16 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBS AND MERCURY.

3.14 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, immediately stop work in that area and immediately inform the Contracting Officer.

3.15 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided. Storage of fuel on the project site must be in accordance with EPA, state, and local laws and regulations and paragraph OIL STORAGE INCLUDING FUEL TANKS.

3.15.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.15.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours that no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a SPCC plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the installation for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.16 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

If petroleum-contaminated soil, or suspected hazardous waste is found during construction that was not identified in the Contract documents, immediately notify the Contracting Officer. Do not disturb this material until authorized by the Contracting Officer.

3.17 CHLORDANE

Evaluate excess soils and concrete foundation debris generated during the demolition of housing units or other wooden structures for the presence of chlordane or other pesticides prior to reuse or final disposal.

3.18 SOUND INTRUSION

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives are not permitted without written permission from the Contracting Officer, and then only during the designated times. Confine pile-driving operations to the period between 8 a.m. and 4 p.m., Monday through Friday, exclusive of holidays, unless otherwise specified.

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State of Hawaii rules.

3.19 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

-- End of Section --

SECTION 01 57 19.01 20

SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS
11/15

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Storage Material Inventory; G

1.2 PACIFIC

Comply with the following state, regional and local requirements which supplement Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

1.2.1 Control and Disposal of Ionization Smoke Detectors and Tritium Exit Signs

1.2.1.1 Material Bagging

Remove existing ionization smoke detectors and tritium exit signs, and place like types, together (that is same manufacturer and model number) in a plastic bag. Label the bag with the following data:

Manufacturer: Activity:
MODEL No.: Contract No.:
Isotope and Quantity (if known):

1.2.1.2 Material Storage

Store plastic bags in 55 gallon covered drum(s). Do not seal the drum(s). Provide a label with a description of the contents and note on the label "TO BE DISPOSED OF BY RASO". Apply the label to the exterior surface of the cover and site of the drum(s). Provide a record copy of the label for each drum storage material inventory to the Contracting Officer, the RASO at COMNAVREG Pearl Harbor, and NAVFAC Hawaii Environmental Department EV4.

1.2.1.3 Storage Site and Disposal

Where permissable under the terms of each task order, deliver drums to MCBH Bunker 709, Sumner Road for storage and disposal of ionization smoke detectors and tritium exit signs as directed by the Contracting Officer.

1.2.1.4 Storage and Disposal by Contractor

Store of ionization smoke detectors and tritium exit signs in accordance

with federal, state, and local laws and regulations.

1.2.2 Hawaii

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 58 00

PROJECT IDENTIFICATION
08/09

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 WOOD PROTECTION ASSOCIATION (AWPA)

AWPA C1	(2003) All Timber Products - Preservative Treatment by Pressure Processes
AWPA C2	(2003) Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Preliminary one line drawings of project rendering; G

preliminary drawing indicating layout and text content; G

SD-04 Samples

Final rendering sample; G

Final framed rendering and copies; G

Facility Recognition Plaque; G

1.3 QUALITY ASSURANCE

1.3.1 Rendering

Provide the project rendering in accordance with the following drawing stages as required in paragraph entitled "Submittals". The following submittal data is required to properly identify the appropriate view and approve the final rendering of the facility. The final painted rendering will be used to produce the image for the signboard and framed photographic copies provided to the Contracting Officer.

1.3.1.1 Preliminary One Line Drawings

Provide three different views of the facility in a preliminary single line

drawing (black and white) format. These three views will represent the best angles at which to view the proposed facility showing the best design features and the three dimensional character of the facility.

1.3.1.2 Final Rendering Sample

Provide a photographic copy (8 by 10 inches minimum size) of final rendering for approval of color, landscaping, and foreground/background development prior to final submittal.

1.3.1.3 Final Framed Rendering and Copies

Provide final full color rendering of the proposed facility as specified.

1.3.2 Facility Recognition Plaque

Submit full size drawing of Facility Recognition Plaque for approval. Contractor shall confirm the content (message), location and mounting with Contracting Officer prior to fabrication. The names on the plaque shall be determined at the end of the project duration to assure that current participants can be identified and recognized on the plaque.

1.4 PROJECT SIGN

Prior to initiating any work on site, provide one project identification sign at the location designated. Construct the sign in accordance with project sign detail, which can be downloaded at: http://www.wbdg.org/ccb/NAVGRAPH/graphtoc.pdf. Maintain sign throughout the life of the project. Upon completion of the project, remove the sign from the site. Provide color rendering of the project. Reproduce the rendering on the signboard or enclose a copy of the rendering under a water-proof, transparent cover, and caulk for weather protection.

1.4.1 Project Identification Signboard (Navy)

A project identification signboard shall be provided in accordance with attached Plates 2MC, 3, 4, and 5. Provide preliminary drawing indicating layout and text content.The signboard shall be provided at a conspicuous location on the job site where directed by the Contracting Officer.

a. The field of the sign shall consist of a 4 by 8 foot sheet of grade B-B medium density overlaid exterior plywood.

b. Lumber shall be B or better Southern pine, pressure-preservative treated in accordance with AWPA C1 and AWPA C2. Nails shall be aluminum or galvanized steel.

c. The entire signboard and supports shall be given one coat of exterior alkyd primer and two coats of exterior alkyd enamel paint. The lettering and sign work shall be performed by a skilled sign painter using paint known in the trade as bulletin colors. The colors, lettering sizes, and lettering styles shall be as indicated. Where preservative-treated lumber is required, utilize only cured pressure-treated wood which has had the chemicals leached from the surface of the wood prior to painting.

d. Use spray applied automotive quality high gloss acrylic white enamel paint as background for the NAVFAC logo. NAVFAC logo shall be an

applied 2 mil film sticker/decal with either transparent or white background or paint the logo by stencil onto the sign. The weather resistant sticker/decal film shall be rated for a minimum of 2-year exterior vertical exposure. The self-adhering sticker shall be mounted to the sign with pressure sensitive, permanent acrylic adhesive. Shop cut sticker/decal to rectangular shape and provide pull-off backing sheet on adhesive side of design sticker for shipping.

e. Sign paint colors (manufacturer's numbers/types listed below for color identification only)

(1) Blue = To match dark blue color in the NAVFAC logo.

(2) White = To match Brilliant White color in the NAVFAC logo.

f. NAVFAC logo must retain proportions and design integrity. NAVFAC logos in electronic format may be obtained from the NAVFAC web portal via the following link:
https://portal.navfac.navy.mil/portal/page?_pageid=181,3465071&_dad=portal&_schema=p
Use the following to choose color values for the paint to be used:

(1) Dark Blue = equivalent to CMYK values 100, 72, 0, 8 .

(2) Light Blue = equivalent to CMYK values 69, 34, 0, 0.

(3) Cyan = equivalent to CMYK values 100, 9, 0, 6.

(4) Yellow = equivalent to CMYK values 0.9,94, 0.

g. Final signboard artwork (rendering) may be either mounted under plexiglass as indicated in attached Plates 2 and 5, or at the Contractor's option may be electrostatically printed on 4 mil self-adhering, weather resistant, glossy vinyl film and mounted to signboard. Provide film that is capable of full color reproduction of the building rendering and cover it with an ultra-violet protection film. Laminate the 2 mil satin gloss clear protection film to the white 4 mil vinyl image film. Utilize pressure sensitive "controltac" adhesive to attach rendering to signboard and smooth out surface with hand pressure tools in accordance with manufacturer's recommendations. Shop cut sticker to size required and provide pull-off backing sheet on adhesive side of film for shipping. Provide the rendering on film that is rated for a minimum of 2 years exterior vertical exposure.

1.4.1.1 Project Rendering

Provide a full color rendering of the proposed facility as specified below:

a. Provide rendering by a company that regularly does this work as a major component of their normal business.

b. Colors used on rendering shall match the exterior color scheme indicated in the contract document.

c. The rendering shall be a full vignette/fully developed, on heavy illustration board. Approximate finished size shall be 24 by 30 inches with minimum inside mat dimension of 16 by 20 inches. Draw the rendering at human eye, roof or bird's eye level view, painted with Case-in Tempera.

d. Provide three preliminary single line black and white perspectives prior to proceeding with the color rendering. Provide these preliminary perspectives within 30 days after contract award for evaluation by the Contracting Officer. The view selected by the Contracting Officer shall be developed into the final rendering.

e. Provide the final rendering sample photograph within 30 days after approval of preliminary single line drawings. Provide this sample photograph for evaluation by the Contracting Officer.

f. Provide final original color rendering, two (2) full size photographic reproductions of the original rendering, and the photographic negative. Original and reproductions shall be mounted on acid free board, double-matted (acid free matting) with appropriate colored board and framed in contemporary metal frames, using non-glare glass. Project name, location, Architect/Engineer firm's name shall be printed on the matting. On the back of the renderings and reproductions, indicated the project name, the location, the contract number, and the date of reproduction.

g. The rendering, the photographic copies, and the negative shall be shipped in resilient packaging to ensure damage-free delivery.

h. Provide copy of rendering to be used for the signboard that has been protected from UV damage as per specifications.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 62 35

RECYCLED/RECOVERED/BIOBASED MATERIALS

05/13

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.

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

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials
48 CFR 23	Environment, Energy and Water Efficiency, Renewable Energy Technologies, Occupational Safety, and Drug-Free Workplace

1.2 OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled, recovered and biobased materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) and the United Stats Department of Agriculture (USDA)has designated certain items which must contain a specified percent range of recovered or recycled materials. EPA and USDA designated products specified in this contract comply with the stated policy and with the EPA and USDA guidelines. Make all reasonable efforts to use recycled, recovered and biobased materials in providing the EPA and USDA designated products and in otherwise utilizing recycled, recovered and biobased materials in the execution of the work.

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Biobased Products; G

1.4 DESIGNATED ITEMS INCORPORATED IN THE WORK

Various sections of the specifications contain requirements for materials that have been designated by EPA and USDA as being products which are or can be made with recovered or recycled, recovered and biobased materials. These items, when incorporated into the work under this contract, shall

contain at least the specified percentage of recycled or recovered materials or biobased unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.5 PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA and USDA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) and USDA's Federal Procument Preferences (FPP) designations. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled, recovered and biobased materials, provided specified requirements are also met.

1.6 LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

Many products listed in 40 CFR 247 and 48 CFR 23 have been designated or proposed by EPA and USDA to include recycled, recovered and biobased materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled, recovered and biobased materials and that these products be recycled when no longer needed.

1.7 BIOPREFERRED FPP

Utilize products and material made from biobased materials to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. All supplies and materials shall be of a type and quality that conform to applicable specifications and standards.

Biobased products that are designated for preferred procurement under USDA’s BioPreferred program must meet the required minimum biobased content. Refer to http://www.biopreferred.gov/ProductCategories.aspx for the product categories and http://www.biopreferred.gov/bioPreferredCatalog/faces/jsp/catalogLanding.jsp for the BioPreferred Catalog. Submit data for the biobased products to include biobased content and source of biobased material; indicating the name of the manufacturer, cost of each material, and the intended use of each of the materials that are to be used in carrying out the requirements of the contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 74 19

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
01/07

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.

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED BD+C	(2009; R 2010) Leadership in Energy and Environmental Design(tm) Building Design and Construction (LEED-NC)
LEED GBDC Ref Guide	(2009; R 2010) LEED Reference Guide for Green Building Design, Construction and Major Renovations of Commercial and Institutional Buildings including Core & Shell and K-12 Projects

1.2 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. Divert a minimum of 60 percent by weight of total project solid waste from the landfill.

1.3 MANAGEMENT

Develop and implement a waste management program. Take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. The Environmental Manager, as specified in Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, is responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the project. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste, consider the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. Implement any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling accrue to the Contractor. Appropriately permit firms and facilities used for recycling, reuse, and disposal for the intended use to the extent required by federal, state, and local regulations. Also, provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return

methods to be used by all parties at the appropriate stages of the project.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Management Plan; G; (LEED BD+C)

SD-11 Closeout Submittals

Records; (LEED BD+C)

1.5 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section 01 45 00.00 20 QUALITY CONTROL. At a minimum, discuss environmental and waste management goals and issues at the following additional meetings:

a. Pre-bid meeting.

b. Preconstruction meeting.

c. Regular site meetings.

d. Work safety meetings.

1.6 WASTE MANAGEMENT PLAN

Submit a waste management plan within 15 days after contract award and not less than 10 days before the preconstruction meeting. The plan demonstrates how to meet the the project waste diversion goal. Also, include the following in the plan:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.

c. Description of the regular meetings to be held to address waste management.

d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.

e. Characterization, including estimated types and quantities, of the waste to be generated.

f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.

g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.

h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Identify the recycling facilities by name, location, and phone number, including a copy of the permit or license for each facility.

i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.

j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.

k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

l. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

Revise and resubmit Plan as required by the Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the Contracting Officer.

1.7 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Keep records in accordance with the LEED GBDC Ref Guide and using the LEED BD+C Letter Template. Quantities may be measured by weight or by volume, but must be consistent throughout. List each type of waste separately noting the disposal or diversion date. Identify the landfill, recycling center, waste processor, or other organization used to process or receive the solid waste. Provide explanations for any waste not recycled or reused. With each application for payment, submit updated documentation for solid waste disposal and diversion, and submit manifests, weight tickets, receipts, and invoices specifically identifying the project and waste material. Make the records available to the Contracting Officer during construction, and deliver to the Contracting Officer upon completion of the construction a copy of the

records.

1.8 COLLECTION

Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management and clearly and appropriately identify them. Provide materials for barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable. Locate out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors. Recycling and waste bin areas are to be kept neat and clean, and handle recyclable materials to prevent contamination of materials from incompatible products and materials. Clean contaminated materials prior to placing in collection containers. Use cleaning materials that are nonhazardous and biodegradable. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Separate materials by one of the following methods:

1.8.1 Source Separated Method.

Separate waste products and materials that are recyclable from trash and sorted as described below into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the following category types as appropriate to the project waste and to the available recycling and reuse programs in the project area:

a. Land clearing debris.

b. Asphalt.

c. Concrete and masonry.

d. Metal (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, lead brass, bronze).

    (1) Ferrous.

    (2) Non-ferrous.

e. Wood (nails and staples allowed).

f. Debris.

g. Glass (colored glass allowed).

h. Paper.

    (1) Bond.

    (2) Newsprint.

(3) Cardboard and paper packaging materials.

i. Plastic.

Type	
1	Polyethylene Terephthalate (PET, PETE)
2	High Density Polyethylene (HDPE)
3	Vinyl (Polyvinyl Chloride or PVC)
4	Low Density Polyethylene (LDPE)
5	Polypropylene (PP)
6	Polystyrene (PS)
7	Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

j. Gypsum.

k. Non-hazardous paint and paint cans.

l. Carpet.

m. Ceiling tiles.

n. Insulation.

o. Beverage containers.

1.8.2 Co-Mingled Method.

Place waste products and recyclable materials into a single container and then transport to a recycling facility where the recyclable materials are sorted and processed.

1.8.3 Other Methods.

Other proposed methods may be used when approved by the Contracting Officer.

1.9 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, dispose of in accordance with the following:

1.9.1 Reuse.

Give first consideration to salvage for reuse since little or no

re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Coordinate reuse with the Contracting Officer. Reuse materials as indicated. Consider sale or donation of waste suitable for reuse.

1.9.2 Recycle.

Recycle waste materials not suitable for reuse, but having value as being recyclable. Recycle all fluorescent lamps, HID lamps, and mercury-containing thermostats removed from the site. Arrange for timely pickups from the site or deliveries to recycling facilities in order to prevent contamination of recyclable materials.

1.9.3 Compost

Consider composting on site if a reasonable amount of compostable material will be available. Compostable materials include plant material, sawdust, and certain food scraps.

1.9.4 Waste.

Dispose of materials with no practical use or economic benefit to waste-to-energy plants where available. As the last choice, dispose of materials at a landfill or incinerator.

1.9.5 Return

Set aside and protect misdelivered and substandard products and materials and return to supplier for credit.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used. -- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS
08/11

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.

ASTM INTERNATIONAL (ASTM)

ASTM E1971	(2005; R 2011) Stewardship for the Cleaning of Commercial and Institutional Buildings

GREEN SEAL (GS)

GS-37	(2012) Cleaning Products for Industrial and Institutional Use

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014) Navy and Marine Corps Design Procedures

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are developed and maintained by the Contractor and depict actual conditions, including deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to Contractor submitted Requests for Information; direction from the Contracting Officer; designs which are the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site. As-built drawings are further defined in NFAS 5252.236-9310. These files serve as the basis for the creation of the record drawings.

1.2.2 Record Drawings

The record drawings are the final compilation of actual conditions reflected in the as-built drawings.

1.3 SOURCE DRAWING FILES

Request the full set of electronic drawings, in the source format, for Record Drawing preparation, after award and at least 30 days prior to required use.

1.3.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose

other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Warranty Management Plan
Warranty Tags
Final Cleaning
Spare Parts Data

SD-08 Manufacturer's Instructions

Posted Instructions

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals; G

SD-11 Closeout Submittals

As-Built Drawings; G
Record Drawings; G
As-Built Record of Equipment and Materials
Final Approved Shop Drawings

Construction Contract Specifications
Certification of EPA Designated Items; G
Interim DD FORM 1354; G
Checklist for DD FORM 1354; G
NAVFAC Sustainable & Energy Data Record Card; G

1.5 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

1.6 WARRANTY MANAGEMENT

1.6.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit one set of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Include within the warranty management plan , but not limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

c. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

d. A list for each warranted equipment, item, feature of construction or system indicating:

   (1) Name of item.
   (2) Model and serial numbers.
   (3) Location where installed.
   (4) Name and phone numbers of manufacturers or suppliers.
   (5) Names, addresses and telephone numbers of sources of spare parts.

(6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
(7) Cross-reference to warranty certificates as applicable.
(8) Starting point and duration of warranty period.
(9) Summary of maintenance procedures required to continue the warranty in force.
(10) Cross-reference to specific pertinent Operation and Maintenance manuals.
(11) Organization, names and phone numbers of persons to call for warranty service.
(12) Typical response time and repair time expected for various warranted equipment.

e. The plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

f. Procedure and status of tagging of all equipment covered by extended warranties.

g. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.6.2 Performance Bond

The Performance Bond must remain effective throughout the construction period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.6.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction

warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.6.4 Warranty Tags

At the time of installation, tag each warranted item with a durable, oil and water resistant tag approved by the Contracting Officer. Attach each tag with a copper wire and spray with a silicone waterproof coating. Also, submit two record copies of the warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

Type of	
Model number	
Serial number	
Contract number	
Warranty period from/to	
Inspector's signature	
Construction Contractor	
Address	
Telephone number	
Warranty contact	
Address	
Telephone number	
Warranty response time	
WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.	

PART 2 PRODUCTS

2.1 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items". Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials:

1) The product does not meet appropriate performance standards;
2) The product is not available within a reasonable time frame;

3) The product is not available competitively (from two or more sources);
4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product)."

Record each product used in the project that has a requirement or option of containing recycled or biobased content in accordance with SECTION 01 33 29 SUSTAINABILITY REPORTING, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, total value of biobased content, exemptions (1, 2, 3, or 4, as indicated), and comments. Recycled and biobased content values may be determined by weight or volume percent, but must be consistent throughout.

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

Provide and maintain As-Built Drawings in accordance with NFAS 5252.236-9310. Submit As-Built Drawings 30 days prior to Beneficial Occupancy Date(BOD).

3.1.1 Markup Guidelines

Make comments and markup the drawings complete without reference to letters, memos, or materials that are not part of the As-Built drawing. Show what was changed, how it was changed, where items(s) were relocated and change related details. These working as-built markup prints must be neat, legible and accurate as follows:

a. Use base colors of red, green, and blue. Color code for changes as follows:

   (1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

   (2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

   (3) Additions (Green) - Added items, lettering in notes and leaders.

b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.

c. Add and denote any additional equipment or material facilities, service lines, incorporated under As-Built Revisions if not already shown in legend.

d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.

e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.

f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.

g. For deletions, cross out all features, data and captions that relate to

that revision.

h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.

i. Indicate one of the following when attaching a print or sketch to a markup print:

1) Add an entire drawing to contract drawings

2) Change the contract drawing to show

3) Provided for reference only to further detail the initial design.

j. Incorporate all shop and fabrication drawings into the markup drawings.

3.1.2 As-Built Drawings Content

Show on the as-built drawings, but not limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building structure.

c. Layout and schematic drawings of electrical circuits and piping.

d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

e. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

g. Changes or Revisions which result from the final inspection.

h. Where contract drawings or specifications present options, show only the option selected for construction on the working as-built markup drawings.

i. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.

j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

k. Changes in location of equipment and architectural features.

j. Modifications (include within change order price the cost to change working as-built markup drawings to reflect modifications) and compliance with FC 1-300-09N procedures.

l. Actual location of anchors, construction and control joints, etc., in concrete.

m. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

n. Location, extent, thickness, and size of stone protection particularly where it will be normally submerged by water.

3.2 RECORD DRAWINGS

Prepare and provide Record Drawings in accordance with FC 1-300-09N. Provide 2 copies of Record Drawings on two separate CDs or DVDs 30 days after BOD.

Prepare final record drawings after the completion of each definable phase of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). Transfer the changes from the approved working as-built markup drawings to the original electronic CAD drawing files. Modify the as-built CAD drawing files to correctly show the features of the project as-built by bringing the working CAD drawing set into agreement with approved working as-built markup drawings, and adding such additional drawings as may be necessary. Refer to FC 1-300-09N Chapter 12 ELECTRONIC DESIGN DELIVERABLES (EDD) FORMAT. Jointly review the working as-built markup drawings with printouts from working as-built CAD drawing PDF files for accuracy and completeness. Monthly review of working as-built CAD drawing PDF file printouts must cover all sheets revised since the previous review. The final record drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final record drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the record drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. These PDF drawing files are part of the permanent records of this project. Any drawings damaged or lost must be satisfactorily replaced at no expense to the Government.

a. Drawing revisions (include within change order price the cost to change working and final record drawings to reflect revisions) and compliance with the following procedures.

(1) Follow directions in the revision for posting descriptive changes.

(2) The revision delta size must be 5/16 inch unless the area where the delta is to be placed is crowded. Use a smaller size delta for crowded areas.

(3) Place a revision delta at the location of each deletion.

(4) For new details or sections which are added to a drawing, place a revision delta by the detail or section title.

(5) For minor changes, place a revision delta by the area changed on the drawing (each location).

(6) For major changes to a drawing, place a revision delta by the title of the affected plan, section, or detail at each location.

(7) For changes to schedules or drawings, place a revision delta either by the schedule heading or by the change in the schedule.

3.3 OPERATION AND MAINTENANCE MANUALS

Provide project operation and maintenance manuals as specified in Section 01 78 23 OPERATION AND MAINTENANCE MANUALS DATA. Provide four electronic copies of the Operation and Maintenance Manual files. Submit to the Contracting Officer for approval within 60 calendar days of the Beneficial Occupancy Date (BOD). Update and resubmit files for final approval at BOD.

3.4 CLEANUP

Provide final cleaning in accordance with ASTM E1971 and submit two copies of the listing of completed final clean-up items. Leave premises "broom clean." Comply with GS-37 for general purpose cleaning and bathroom cleaning. Use only nonhazardous cleaning materials, including natural cleaning materials, in the final cleanup. Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean filters of operating equipment and comply with the Indoor Air Quality (IAQ) Management Plan. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site. Recycle, salvage, and return construction and demolition waste from project in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, and 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.

3.5 NAVFAC SUSTAINABLE & ENERGY DATA RECORD CARD

Within 60 days of the completion of Project, complete an electronic copy of the NAVFAC Sustainable & Energy Data Record Card, and submit to the Contracting Officer. Draft Record card for this project should be available from Designer of Record (DOR) or Contracting Officer. Instructions and a blank DD Form (fill-able) in ADOBE (PDF) may be obtained at the Whole Building Design Guide web site by navigating:
Home > Participating Agencies > Department of Defense (DoD) > NAVFAC Sustainable Development Program > Contract Documents > NAVFAC Sustainable & Energy Data Record Card; or directly at
http://www.wbdg.org/pdfs/navfac_sustainable_energy_data_record_card.pdf.

-- End of Section --

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA
08/15

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.

ASTM INTERNATIONAL (ASTM)

ASTM E1971	(2005; R 2011) Stewardship for the Cleaning of Commercial and Institutional Buildings

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

O&M Database ; G

Training Plan ; G

Training Outline ; G

Training Content ; G

SD-11 Closeout Submittals

Training Video Recording ; G

Validation of Training Completion ; G

1.3 OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data for the provided equipment, product, or system, defining the importance of system interactions, troubleshooting, and long-term preventive operation and maintenance. Compile, prepare, and aggregate O&M data to include clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.3.1 Package Quality

Documents must be fully legible. Operation and Maintenance data must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions.

1.3.2 Package Content

Provide data package content in accordance with paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES. Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission, except as follows. Use Data Package 3, 4 or 5 for commissioned items without a specified data package requirement in the individual technical sections. Provide a Data Package 3, 4 or 5 instead of Data Package 1 or 2, as specified in the individual technical section, for items that are commissioned.

1.3.3 Changes to Submittals

Provide manufacturer-originated changes or revisions to submitted data if a component of an item is so affected subsequent to acceptance of the O&M Data. Submit changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data within 30 calendar days of the notification of this change requirement.

1.4 O&M DATABASE

Develop an editable, electronic spreadsheet based on the equipment in the Operation and Maintenance Manuals that contains the information required to start a preventive maintenance program. As a minimum, provide list of system equipment, location installed, warranty expiration date, manufacturer, model, and serial number.

1.5 OPERATION AND MAINTENANCE MANUAL FILE FORMAT

Assemble data packages into electronic Operation and Maintenance Manuals. Assemble each manual into a composite electronically indexed file using the most current version of Adobe Acrobat or similar software capable of producing PDF file format. Provide compact disks (CD) or data digital versatile disk (DVD) as appropriate, so that each one contains operation, maintenance and record files, project record documents, and training videos. Include a complete electronically linked operation and maintenance directory.

1.5.1 Organization

Bookmark Product and Drawing Information documents using the current version of CSI Masterformat numbering system, and arrange submittals using the specification sections as a structure. Use CSI Masterformat and UFGS numbers along with descriptive bookmarked titles that explain the content of the information that is being bookmarked.

1.5.2 CD or DVD Label and Disk Holder or Case

Provide the following information on the disk label and disk holder or case:

a. Building Number

b. Project Title

c. Activity and Location

d. Construction Contract Number

e. Prepared For: (Contracting Agency)

f. Prepared By: (Name, title, phone number and email address)

g. Include the disk content on the disk label

h. Date

i. Virus scanning program used

1.6 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

The following are a detailed description of the data package items listed in paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES.

1.6.1 Operating Instructions

Provide specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.6.1.1 Safety Precautions and Hazards

List personnel hazards and equipment or product safety precautions for operating conditions. List all residual hazards identified in the Activity Hazard Analysis provided under Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS. Provide recommended safeguards for each identified hazard.

1.6.1.2 Operator Prestart

Provide procedures required to install, set up, and prepare each system for use.

1.6.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.6.1.4 Normal Operations

Provide Control Diagrams with data to explain operation and control of systems and specific equipment. Provide narrative description of Normal Operating Procedures.

1.6.1.5 Emergency Operations

Provide Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Provide Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.6.1.6 Operator Service Requirements

Provide instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gauge readings.

1.6.1.7 Environmental Conditions

Provide a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.6.1.8 Operating Log

Provide forms, sample logs, and instructions for maintaining necessary operating records.

1.6.1.9 Additional Requirements for HVAC Control Systems

Provide Data Package 5 and the following for control systems:

a. Narrative description on how to perform and apply functions, features, modes, and other operations, including unoccupied operation, seasonal changeover, manual operation, and alarms. Include detailed technical manual for programming and customizing control loops and algorithms.

b. Full as-built sequence of operations.

c. Copies of checkout tests and calibrations performed by the Contractor (not Cx tests).

d. Full points list. Provide a listing of rooms with the following information for each room:

(1) Floor

(2) Room number

(3) Room name

(4) Air handler unit ID

(5) Reference drawing number

(6) Air terminal unit tag ID

(7) Heating or cooling valve tag ID

(8) Minimum cfm

(9) Maximum cfm

e. Full print out of all schedules and set points after testing and acceptance of the system.

f. Full as-built print out of software program.

g. Marking of system sensors and thermostats on the as-built floor plan

and mechanical drawings with their control system designations.

1.6.2 Preventive Maintenance

Provide the following information for preventive and scheduled maintenance to minimize repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.6.2.1 Lubrication Data

Include the following preventive maintenance lubrication data, in addition to instructions for lubrication required under paragraph OPERATOR SERVICE REQUIREMENTS:

a. A table showing recommended lubricants for specific temperature ranges and applications.

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.

c. A Lubrication Schedule showing service interval frequency.

1.6.2.2 Preventive Maintenance Plan, Schedule, and Procedures

Provide manufacturer's schedule for routine preventive maintenance, inspections, condition monitoring (predictive tests) and adjustments required to ensure proper and economical operation and to minimize repairs. Provide instructions stating when the systems should be retested. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

a. Define the anticipated time required to perform each of each test (work-hours), test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventive maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize repairs.

b. Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include electrical and mechanical schematics and diagrams and diagnostic techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.6.2.3 Cleaning Recommendations

Provide environmentally preferable cleaning recommendations in accordance with ASTM E1971.

1.6.3 Repair

Provide manufacturer's recommended procedures and instructions for correcting problems and making repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.6.3.1 Troubleshooting Guides and Diagnostic Techniques

Provide step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.6.3.2 Wiring Diagrams and Control Diagrams

Provide point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.6.3.3 Repair Procedures

Provide instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.6.3.4 Removal and Replacement Instructions

Provide step-by-step procedures and a list of required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Use a combination of text and illustrations.

1.6.3.5 Spare Parts and Supply Lists

Provide lists of spare parts and supplies required for repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.6.3.6 Repair Work-Hours

Provide manufacturer's projection of repair work-hours including requirements by type of craft. Identify, and tabulate separately, repair that requires the equipment manufacturer to complete or to participate.

1.6.4 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.6.4.1 Product Submittal Data

Provide a copy of SD-03 Product Data submittals documented with the

required approval.

1.6.4.2 Manufacturer's Instructions

Provide a copy of SD-08 Manufacturer's Instructions submittals documented with the required approval.

1.6.4.3 O&M Submittal Data

Provide a copy of SD-10 Operation and Maintenance Data submittals documented with the required approval.

1.6.4.4 Parts Identification

Provide identification and coverage for the parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing must show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Group the parts shown in the listings by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.

1.6.4.5 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary componentsof the system. Provide copies of warranties required by Section 01 78 00 CLOSEOUT SUBMITTALS.

1.6.4.6 Extended Warranty Information

List all warranties for products, equipment, components, and sub-components whose duration exceeds one year. For each warranty listed, indicate the applicable specification section, duration, start date, end date, and the point of contact for warranty fulfillment. Also, list or reference the specific operation and maintenance procedures that must be performed to keep the warranty valid. Provide copies of warranties required by Section 01 78 00 CLOSEOUT SUBMITTALS.

1.6.4.7 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.6.4.8 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components. Provide final set points.

1.6.4.9 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms. Provide final set points.

1.6.4.10 Field Test Reports

Provide a copy of Field Test Reports (SD-06) submittals documented with the required approval.

1.6.4.11 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.7 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Provide the O&M data packages specified in individual technical sections. The information required in each type of data package follows:

1.7.1 Data Package 1

NOTE: Data Package 1 would typically be used for architectural items requiring simple but specific maintenance and replacement; for example, acoustical ceiling, floor tile or carpeting system.

a. Safety precautions and hazards

b. Cleaning recommendations

c. Maintenance and repair procedures

d. Warranty information

e. Extended warranty information

f. Contractor information

g. Spare parts and supply list

1.7.2 Data Package 2

NOTE: Data Package 2 would be used for an item that is less simple; for example, an item having a motor and some sequence of operation such as a refrigerated drinking fountain.

a. Safety precautions and hazards

b. Normal operations

c. Environmental conditions

d. Lubrication data

e. Preventive maintenance plan, schedule, and procedures

f. Cleaning recommendations

g. Maintenance and repair procedures

h. Removal and replacement instructions

i. Spare parts and supply list

j. Parts identification

k. Warranty information

l. Extended warranty information

m. Contractor information

1.7.3 Data Package 3

NOTE: Data Package 3 would be used for a complex piece of equipment, having a specific troubleshooting sequence, but one which does not require an operator on watch; for example, HVAC temperature controls

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Environmental conditions

g. Operating log

h. Lubrication data

i. Preventive maintenance plan, schedule, and procedures

j. Cleaning recommendations

k. Troubleshooting guides and diagnostic techniques

l. Wiring diagrams and control diagrams

m. Maintenance and repair procedures

n. Removal and replacement instructions

o. Spare parts and supply list

p. Product submittal data

q. O&M submittal data

r. Parts identification

s. Warranty information

t. Extended warranty information

u. Testing equipment and special tool information

v. Testing and performance data

w. Contractor information

x. Field test reports

1.7.4 Data Package 4

NOTE: Data Package 4 would be used for an extremely complex piece of equipment, having an extensive sequence of operation, a complex troubleshooting sequence and one requiring frequent operator attention; at least for start-up and shut-down. Examples of this case would be small boilers and small diesel generator sets.

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Operator service requirements

g. Environmental conditions

h. Operating log

i. Lubrication data

j. Preventive maintenance plan, schedule, and procedures

k. Cleaning recommendations

l. Troubleshooting guides and diagnostic techniques

m. Wiring diagrams and control diagrams

n. Repair procedures

o. Removal and replacement instructions

p. Spare parts and supply list

q. Repair work-hours

r. Product submittal data

s. O&M submittal data

t. Parts identification

u. Warranty information

v. Extended warranty information

w. Personnel training requirements

x. Testing equipment and special tool information

y. Testing and performance data

z. Contractor information

aa. Field test reports

1.7.5 Data Package 5

NOTE: Data Package 5 would be used for electrical equipment, components or systems on which, wiring and control diagrams are needed for operation, maintenance or repair. Examples of this case are 400 Hz frequency converters, annunciator panels and cathodic protection systems

a. Safety precautions and hazards

b. Operator prestart

c. Start-up, shutdown, and post-shutdown procedures

d. Normal operations

e. Environmental conditions

f. Preventive maintenance plan, schedule, and procedures

g. Troubleshooting guides and diagnostic techniques

h. Wiring and control diagrams

i. Maintenance and repair procedures

j. Removal and replacement instructions

k. Spare parts and supply list

l. Product submittal data

m. Manufacturer's instructions

n. O&M submittal data

o. Parts identification

p. Testing equipment and special tool information

q. Warranty information

r. Extended warranty information

s. Testing and performance data

t. Contractor information

u. Field test reports

v. Additional requirements for HVAC control systems

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TRAINING

Prior to acceptance of the facility by the Contracting Officer for Beneficial Occupancy, provide comprehensive training for the systems and equipment specified in the technical specifications. The training must be targeted for the Facilities Management Specialist, building maintenance personnel, and applicable building occupants. Instructors must be well-versed in the particular systems that they are presenting. Address aspects of the Operation and Maintenance Manual submitted in accordance with Section 01 78 00 CLOSEOUT SUBMITTALS and eOMSI Manual, as submitted in Section 01 78 24.00 20 FACILITY ELECTRON0IC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI) if required by the task order. Training must include classroom or field lectures based on the system operating requirements. The location of classroom training requires approval by the Contracting Officer.

3.1.1 Training Plan

Submit a written training plan to the Contracting Officer for approval at least 60 calendar days prior to the scheduled training. Training plan must be approved by the Quality Control Manager (QC) prior to forwarding to the Contracting Officer. Also, coordinate the training schedule with the Contracting Officer and QC. Include within the plan the following elements:

a. Equipment included in training

b. Intended audience

c. Location of training

d. Dates of training

e. Objectives

f. Outline of the information to be presented and subjects covered including description

g. Start and finish times and duration of training on each subject

h. Methods (e.g. classroom lecture, video, site walk-through, actual operational demonstrations, written handouts)

i. Instructor names and instructor qualifications for each subject

j. List of texts and other materials to be furnished by the Contractor that are required to support training

k. Description of proposed software to be used for video recording of training sessions.

3.1.2 Training Content

The core of this training must be based on manufacturer's recommendations and the operation and maintenance information. The QC is responsible for overseeing and approving the content and adequacy of the training. Provide a brief summary of the FACILITY INFORMATION manual, and a more detailed presentation of the PRODUCT AND DRAWING MANUAL, specified in Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI). Spend 95 percent of the instruction time during the presentation on the OPERATION AND MAINTENANCE DATA. Include the following for each system training presentation:

a. Start-up, normal operation, shutdown, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting, and alarms.

b. Relevant health and safety issues.

c. Discussion of how the feature or system is environmentally responsive. Advise adjustments and optimizing methods for energy conservation.

d. Design intent.

e. Use of O&M Manual Files.

f. Review of control drawings and schematics.

g. Interactions with other systems.

h. Special maintenance and replacement sources.

i. Tenant interaction issues.

3.1.3 Training Outline

Provide the Operation and Maintenance Manual Files (Bookmarked PDF), or if required, the eOMSI Manual files as specified in Section 01 78 24.00 20, FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI), and a written course outline listing the major and minor topics to be discussed by the instructor on each day of the course to each trainee in the course. Provide the course outline 14 calendar days prior to the training.

3.1.4 Training Video Recording

Record classroom training session(s) on video. Provide to the Contracting Officer two copies of the training session(s) in DVD video recording format. Capture within the recording, in video and audio, the instructors' training presentations including question and answer periods with the attendees. The recording camera(s) must be attended by a person during the recording sessions to assure proper size of exhibits and projections during the recording are visible and readable when viewed as training.

3.1.5 Unresolved Questions from Attendees

If, at the end of the training course, there are questions from attendees that remain unresolved, the instructor must send the answers, in writing, to the Contracting Officer for transmittal to the attendees, and the training video must be modified to include the appropriate clarifications.

3.1.6 Validation of Training Completion

Ensure that each attendee at each training session signs a class roster daily to confirm Government participation in the training. At the completion of training, submit a signed validation letter that includes a sample record of training for reporting what systems were included in the training, who provided the training, when and where the training was performed, and copies of the signed class rosters. Provide two copies of the validation to the Contracting Officer, and one copy to the Operation and Maintenance Manual Preparer for inclusion into the Manual's documentation.

3.1.7 Quality Control Coordination

Coordinate this training with the QC in accordance with Section 01 45 00.00 20 QUALITY CONTROL.

-- End of Section --

SECTION 01 78 24.00 20

FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI)
02/15

PART 1 GENERAL

NOTE: This eOMSI requirement for the following type of projects:
1. New construction, Milcon, greater than of equal to $750K.
2. Major renovation projects greater than or equal to 50% of the Plant Replacement Value and greater than or equal to $2.5M.

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.

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014) Navy and Marine Corps Design Procedures

1.2 DEFINITIONS AND ABBREVIATIONS

1.2.1 eOMSI Manual

Manual (PDF file) provided by the Contractor that includes, but is not limited to, product information, a facility description with photos, and a list of primary facility systems.

1.2.2 eOMSI Facility Data Workbook (FDW)

A Microsoft Excel file containing required facility information populated by the Contractor.

1.2.3 Systems

The words "system", "systems", and "equipment", when used in this document refer to as-built systems and equipment.

1.2.4 Computer Assisted Design and Drafting (CADD)

Electronic Computer Assisted Design and Drafting graphic software program that is used to create facility design contract documents and Record Drawings.

1.2.5 KTR

An abbreviation for "Contractor."

1.3 EOMSI MEETINGS

1.3.1 Pre-Construction Meeting

Be prepared to discuss the following during this meeting:

a. eOMSI Manual and eOMSI Facility Data Workbook Development Meetings

b. Processes and methods of gathering eOMSI Manual and eOMSI Facility Data Workbook information during construction.

c. The eOMSI Submittals schedule. Include the eOMSI submittal schedule on the Baseline Construction Schedule in accordance with Section 01 32 17.00 20 COST-LOADED NETWORK ANALYSIS SCHEDULE (NAS).

d. Electronic eOMSI Facility Data Workbook file for Contractor's use and completion.

1.3.2 eOMSI Manual and Facility Data Workbook Coordination Meeting

Facilitate a meeting after the Pre-Construction Meeting prior to the submission of the eOMSI Progress Submittal. Meeting attendance must include the Contractor's eOMSI Manual and Facility Data Workbook Preparer, and Quality Control Manager, the Commissioning Authority (CxA), and the Government's Design Manager (DM), Contracting Officer's Representative, and NAVFAC Public Works (PW) Facilities Management Division (FMD). Include any Mechanical, Electrical, and Fire Protection Sub-Contractors.

The purpose of this meeting is to reach a mutual understanding of the scope of work concerning the contract requirements for eOMSI and coordinate the efforts necessary by both the Government and Contractor to ensure an accurate collection, preparation and timely Government review of eOMSI.

1.3.3 Facility Turnover Meeting

Include eOMSI in NAVFAC Red Zone (NRZ) facility turnover meetings as specified in Section 01 30 00, ADMINISTRATIVE REQUIREMENTS.

1.4 SUBMITTAL SCHEDULING

1.4.1 eOMSI, Progress Submittal

Submit the Progress submittal when construction is approximately 50 percent complete, to the Contracting Officer for approval. Provide eOMSI Manual Files (Bookmarked PDF) and eOMSI Facility Data Workbook (Excel). Include the elements and portions of system construction completed up to this point.

The purpose of this submittal is to verify progress is in accordance with contract requirements as discussed during the eOMSI Coordination Meeting. Field verify a portion of the eOMSI information in accordance with paragraph FIELD VERIFICATION.

1.4.2 eOMSI, Prefinal Submittal

Submit the 100 percent submittal of the eOMSI Prefinal Submittal to the Contracting Officer for approval within 90 calendar days of the Beneficial Occupancy Date (BOD). This submittal must provide a complete, working document that can be used to operate and maintain the facility. Any portion of the submittal that is incomplete or inaccurate requires the entire submittal to be returned for correction. Any discrepancies discovered during the Government's review of eOMSI Progress submittal must be corrected prior to the Prefinal submission.

The eOMSI Prefinal Submittal must include eOMSI Manual Files (Bookmarked PDF) and eOMSI Facility Data Workbook (Excel).

1.4.3 eOMSI, Final Submittal

Submit completed eOMSI Manual Files (Bookmarked PDF) and eOMSI Facility Data Workbook (Excel). The Final submittal is due at BOD. Any discrepancies discovered during the Government's review of the Prefinal eOMSI submittal, including the Field Verification, must be corrected prior to the Final eOMSI submission.

1.5 UNITS OF MEASURE

Provide eOMSI utilizing the units of measure used in the Government generated contract documents.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

eOMSI, Progress Submittal; G

eOMSI, Prefinal Submittal; G

eOMSI, Final Submittal; G

PART 2 PRODUCTS

2.1 eOMSI FILES FORMAT

Format eOMSI manuals and files in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA. Include a complete electronically linked operation and maintenance directory. Provide four electronic copies of the eOMSI Manuals to the Contracting Officer for approval.

Provide eOMSI Facility Data Workbook on compact disks (CD) or data digital versatile disk (DVD) disks in (EXCEL) format. Scan eOMSI Manual Files and eOMSI Facility Data Workbook for viruses, malware, and spyware using a commercially available scanning program that is routinely updated to identify and remove current virus threats.

2.1.1 eOMSI Manual Organization

Organize the eOMSI Manuals into two parts: 1) Product and Drawing Information, and 2) Facility Information. Bookmark the PDF files for easy access to the information.

a. Bookmark Product and Drawing Information documents in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

b. Bookmark Facility Information to at least one level lower than the major system.

2.1.2 eOMSI Manual CD or DVD Disk Label and Disk Holder or Case

Provide disks in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

2.2 eOMSI MANUAL

2.2.1 Product and Drawing Information

Provide an organized record of the facility products, materials, equipment, and minimum information necessary to operate the facility. Provide Product and Drawing Information for the systems in the final constructed facility.

2.2.1.1 O&M Data

As a minimum, provide the approved O&M Data, submitted in the technical specification sections, in accordance with paragraph TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES in Section 01 78 23 OPERATION AND MAINTENANCE DATA.

2.2.1.2 Record Drawings

Provide an electronic, PDF copy of the Record Drawings, prepared in accordance with FC 1-300-09N and 01 78 00 CLOSEOUT SUBMITTALS. Bookmark drawings using the sheet title and sheet number.

Include Record Drawings as part of the Red-Zone specified in Section 01 30 00 ADMINISTRATIVE REQUIREMENTS.

2.2.1.3 Utility Record Drawings

Using Record Source Drawings, show and document details of the actual installation of the utility systems; annotate and highlight the eOMSI information. Provide Utility Record Drawings in PDF format. Provide the following drawings at a large enough scale to differentiate designated isolation units from surrounding valves and switches.

a. Utility Schematic Diagrams - Provide a one line schematic diagram for each utility system such as power, water, wastewater, and gas/fuel. Schematic diagram must show from the point where the utility line is connected to the mainline up to the five-foot connection point to the facility. Indicate location or area designation for route of transmission or distribution lines; locations of duct banks, manholes/ handholes or poles; isolation units such as valves and switches; and utility facilities such as pump stations, lift stations, and substations.

b. Enlarged Connection and Cutoff Plans - Provide enlarged floor plans that provide information between the five foot utility connection point and where utilities connect to facility distribution. Enlarge floor plans/ elevations of the rooms where the utility enters the building and indicate on these plans locations of the main interior and exterior connection and cutoff points for the utilities. Also enlarge floor plans / elevations of the rooms where equipment is located. Include enough information to enable someone unfamiliar with the facility to locate the connection and cutoff points. Indicate designations such as room number, panel number, circuit breaker, or valve number, of each utility and equipment connection and cutoff point, and what that connection and cutoff point controls.

2.2.2 Facility Information

Provide the following in Facility Information:

2.2.2.1 General Facility and System Description

Describe the function of the facility. Detail the overall dimensions of the facility, number of floors, foundation type, expected number of occupants, and facility Category Code. List and generally describe all the facility systems and any special building features (for example, HVAC Controls, Sprinkler Systems, Cranes, Elevators, and Generators). Include photographs marked up and labeled to show key operating components and the overall facility appearance.

2.2.2.2 Floor Plans

Provide uncluttered, legible 11 by 17 inches floor plans. Include room numbers, type or function of spaces, and overall facility dimensions on the floor plans. Do not include items such as construction instructions, references, or frame numbers.

2.2.2.3 Floor Coverings, Wall Surfaces, and Ceiling Surfaces

Provide a table that lists by room number (including hallways and common spaces), the type, and area of finish, manufacturer's product name, identifying number, and color. Include a facility summary of the total area for each type of space and floor, wall, or ceiling finish in the table.

2.2.2.4 Windows

Provide a table that lists by room number (including hallways and common spaces), the type of window, window size, number of each size and type, special features, manufacturer's product name, identifying number, and color. The table must include a facility summary of the total number for each type and size of window.

2.2.2.5 Roofing

Provide the total area of each type of roof surface and system. Provide the name of the roofing product and system; manufacturer's, supplier's, and installer's names, addresses, and phone numbers; manufacturer's product name, identifying number, and color. For each type of roof, provide a recommended inspection, maintenance and repair schedule that details checkpoints, frequencies, and prohibited practices. List roof structural load limits.

2.2.2.6 HVAC Filters

Provide a table that lists the quantity, type, size, and location of each HVAC filter, manufacturer's product name, and identifying number.

2.2.2.7 Plumbing Fixtures

Provide a table that lists by room number, the number and type of plumbing and bathroom plumbing fixtures (for example, sinks, water closets, urinals, showers and drinking fountains).

2.2.2.8 Lighting Fixtures

Provide a table that lists by room number (including hallways and common spaces), the type of lighting fixture, ballast, number of lighting fixtures, type of lamps and number of lamps, and the manufacturer's product name and the identifying number. The table must include a facility summary of the total number of fixtures of each type and number of lamps of each type.

2.2.2.9 Equipment Listing

Provide a table that lists the major equipment shown on the design equipment schedules. Show the item descriptions, locations, model numbers; and the names, addresses, and telephone numbers of the manufacturers, suppliers, contractors, and subcontractors.

2.2.2.10 System Flow Diagrams

Provide a flow diagram indicating system liquid, air or gas flow during normal operations. Integrate the system components into the diagram. A compilation of non-integrated, flow diagrams for the individual system components are not acceptable.

2.2.2.11 Valve List

Provide a list of all valves associated with the system. Show valve type, identification number, function, location and normal operating position.

2.2.2.12 Riser Diagrams

Provide riser diagrams and settings of equipment.

2.3 eOMSI FACILITY DATA WORKBOOK

An initial, pre-edited draft of the Model & Facility Data Matrix tab within the eOMSI Facility Data Workbook is attached to this section. The Government will provide this eOMSI Facility Data Workbook electronically to the Contractor upon award. Add, delete, and update Mastersystems, Systems, and Subsystems that may have changed during construction, or any items that may have been omitted or missed during design, at no additional cost to the Government. Complete the KTR Facility Data File tab based on the selection of Mastersystems, Systems, and Subsystems installed. The following tabs are included in the eOMSI Facility Data File Workbook and serve the purpose stated:

a. Instructions Tab: Instructions for completing Model & Facility Data Matrix Tab and KTR Facility Data File Tab. If a discrepancy exists between what is required in this section and the Workbook, the instructions within the workbook take precedence.

b. Model & Facility Data Matrix Tab: - The Matrix lists Required Facility Asset Fields for each SYSTEM and SUBSYSTEM. The Designer of Record selects SYSTEMS and SUBSYSTEMS that are within the project scope, which the Contractor needs to include and populate in KTR Facility Data File tab. The "Required Facility Asset Field Position Numbers," one through seventeen, are pre-populated, and are not editable.

c. Required Facility Asset Fields Tab: Defines the 17 Required Facility Asset Field Position Numbers used in Model and Facility Data Matrix and

KTR Facility Data File tabs.

d. KTR Sample Facility Data File Tab: Sample KTR eOMSI facility data file. This tab provides an example of the mandatory fields of equipment installed by the Contractor, and populated in the KTR eOMSI Facility Data File Tab, along with their descriptions.

e. KTR Facility Data File Tab: Required eOMSI facility data file deliverable provided to the Government. Provide a separate and unique new row for each facility component or piece of equipment installed.

PART 3 EXECUTION

3.1 FIELD VERIFICATION

Field verify eOMSI Facility Data Workbook information with Contractor and Government personnel. Include the following personnel in this meeting: Contractor's eOMSI Manual and Facility Data Workbook Preparer and Quality Control Manager, Commissioning Authority, and the Government's Contracting Officer's Representative and NAVFAC PW FMD. Request, and provide, an eOMSI Field Verification Meeting no sooner than 14 calendar days after submission of the Progress eOMSI submittal, and another, no sooner than 14 calendar days after submission of the Prefinal eOMSI submittal. During this meeting, the Government and Contractor will verify that the eOMSI Facility Data Workbook is complete and accurate.

Field verify that at least 5 Subsystems under each of the Mastersystems are accurate, for a total of 25 Subsystems. For each of these items, verify that the required facility asset field, as defined in the "Model & Facility Data Matrix" tab, contains the specified data and it is accurate (i.e. item description, manufacturer, model no., serial no.). 100 percent accuracy of eOMSI information is required for successful field verification. If data discrepancies are discovered amongst the 25 Subsystems verified, resubmit an updated eOMSI FDW, and request a make-up field verification meeting. At the make-up field verification meeting 25 new Subsystems and their associated required facility asset fields will be field verified; the 25 new Subsystems must be 100% accurate. Any discrepancies discovered must be corrected prior to next eOMSI Facility Data Workbook Submittal.

(1) D10 - CONVEYING
(2) D20 - PLUMBING
(3) D30 - HVAC
(4) D40 - FIRE PROTECTION
(5) D50 - ELECTRICAL

3.2 eOMSI TRAINING

Provide training on eOMSI Manuals and Facility Data Workbook in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

-- End of Section --

SECTION 02 41 00

DEMOLITION AND DECONSTRUCTION
05/10

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.

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)

AHRI Guideline K	(2009) Guideline for Containers for Recovered Non-Flammable Fluorocarbon Refrigerants

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 145	(1991; R 2008) Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
AASHTO T 180	(2010) Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6	(2006) Safety Requirements for Demolition Operations

CARPET AND RUG INSTITUTE (CRI)

CRI CIS	(2011) Carpet Installation Standard

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008; Errata 1-2010; Changes 1-3 2010; Changes 4-6 2011; Change 7 2012) Safety and Health Requirements Manual

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25	(June 2000) Storage and Handling of Liquefied and Gaseous Compressed Gases and Their Full and Empty Cylinders

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M	(2006) MILSTRIP - Military Standard Requisitioning and Issue Procedures

MIL-STD-129	(2014; Rev R) Military Marking for Shipment and Storage

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

40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 82	Protection of Stratospheric Ozone
49 CFR 173.301	Shipment of Compressed Gases in Cylinders and Spherical Pressure Vessels

1.2 PROJECT DESCRIPTION

1.2.1 Demolition/Deconstruction Plan

Prepare a either a Demolition Plan or Deconstruction Plan and submit proposed salvage, demolition, deconstruction, and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Identify components and materials to be salvaged for reuse or recycling with reference to paragraph Existing Facilities to be Removed. Append tracking forms for all removed materials indicating type, quantities, condition, destination, and end use. Coordinate with Waste Management Plan. Include statements affirming Contractor inspection of the existing roof deck and its suitability to perform as a safe working platform or if inspection reveals a safety hazard to workers, state provisions for securing the safety of the workers throughout the performance of the work. Provide procedures for safe conduct of the work in accordance with EM 385-1-1. Plan shall be approved by Structural PE prior to work beginning.

1.2.2 General Requirements

Do not begin demolition or deconstruction until authorization is received from the Contracting Officer. The work of this section is to be performed in a manner that maximizes the value derived from the salvage and recycling of materials. The work includes demolition, deconstruction, salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 ITEMS TO REMAIN IN PLACE

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Contracting Officer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload structural elements . Provide new supports and reinforcement for

existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Contracting Officer prior to performing such work.

1.3.1 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

1.3.2 Weather Protection

For portions of the building to remain, protect building interior and materials and equipment from the weather at all times. Where removal of existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas.

1.3.3 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.3.4 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Government and disconnected and sealed by the Contractor .

1.3.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished or deconstructed, unless directed otherwise by the Contracting Officer. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

1.4 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted . Where burning is permitted, adhere to federal, state, and local regulations.

1.5 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be available in accordance with the following schedule:

Schedule	
Area	Date

1.6 SUBMITTALS

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

SD-01 Preconstruction Submittals

Existing Conditions; G

SD-07 Certificates

Demolition Plan; G
Deconstruction Plan; G
Notification; G
Notification of Demolition and Renovation form; G

SD-11 Closeout Submittals

Receipts

1.7 QUALITY ASSURANCE

Submit timely notification of demolition deconstruction and renovation projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the Regional Office of the United States Environmental Protection Agency (USEPA) State's environmental protection agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSE/SAFE A10.6. Comply with the Environmental Protection Agency requirements specified. Use of explosives will not be permitted.

1.7.1 Hawaii Requirements

Complete and submit Notification of Demolition and Renovation form to Federal and State authorities and Contracting Officer, postmarked or delivered at least ten working days prior to commencement of work, in accordance with 40 CFR 61, Subpart M. Complete paragraphs I, II, III.B, III.C (if applicable), IX, and XVI of form. Copy of form is attached at end of this section.

1.7.2 Dust and Debris Control

Prevent the spread of dust and debris to occupied portions of the building

and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to aircraft.

1.8 PROTECTION

1.8.1 Traffic Control Signs

a. Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning such work.

1.8.2 Protection of Personnel

Before, during and after the demolition and deconstruction work continuously evaluate the condition of the structure being demolished and deconstructed and take immediate action to protect all personnel working in and around the project site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.9 FOREIGN OBJECT DAMAGE (FOD)

Aircraft and aircraft engines are subject to FOD from debris and waste material lying on airfield pavements. Remove all such materials that may appear on operational aircraft pavements due to the Contractor's operations. If necessary, the Contracting Officer may require the Contractor to install a temporary barricade at the Contractor's expense to control the spread of FOD potential debris. The barricade shall include a fence covered with a fabric designed to stop the spread of debris. Anchor the fence and fabric to prevent displacement by winds or jet/prop blasts. Remove barricade when no longer required.

1.10 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Contracting Officer.

1.11 EXISTING CONDITIONS

Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results.

PART 2 PRODUCTS

2.1 FILL MATERIAL

a. Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill basements, voids, depressions or excavations resulting from demolition or deconstruction of structures. Fill material shall be waste products from demolition or deconstruction until all waste appropriate for this purpose is consumed.

b. Fill material shall conform to the definition of satisfactory soil material as defined in AASHTO M 145, Soil Classification Groups A-1, A-2-4, A-2-5 and A-3. In addition, fill material shall be free from roots and other organic matter, trash, debris, frozen materials, and stones larger than 2 inches in any dimension.

c. Proposed fill material must be sampled and tested by an approved soil testing laboratory, as follows:

Soil classification	AASHTO M 145
Moisture-density relations	AASHTO T 180, Method B or D

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse onsite whenever possible.

3.1.1 Structures

a. Remove existing structures indicated to be removed to grade . Interior walls, other than retaining walls and partitions, shall be removed to 2 feet below grade or to top of concrete slab on ground. Break up basement slabs to permit drainage. Remove sidewalks, curbs, gutters and street light bases as indicated.

b. Demolish or Deconstruct structures in a systematic manner from the top of the structure to the ground. Complete demolition work above each tier or floor before the supporting members on the lower level are disturbed. Demolish concrete and masonry walls in small sections. Remove structural framing members and lower to ground by means of derricks, platforms hoists, or other suitable methods as approved by the Contracting Officer.

c. Locate demolition and deconstruction equipment throughout the structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing.

d. Building, or the remaining portions thereof, not exceeding 80 feet in height may be demolished by the mechanical method of demolition.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contracting Officer. Do not interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition or deconstruction work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered but are not indicated on the drawings, notify the Contracting Officer prior to further work in that area. Remove meters and related equipment and deliver to a location on the station in accordance with instructions of the Contracting Officer.

3.1.3 Chain Link Fencing

Remove chain link fencing, gates and other related salvaged items scheduled for removal and transport to designated areas. Remove gates as whole units. Cut chain link fabric to 25 foot lengths and store in rolls off the ground.

3.1.4 Paving and Slabs

Remove ground concrete and asphaltic concrete paving and slabs including aggregate base to a depth of 12 inches below existing adjacent grade. Provide neat sawcuts at limits of pavement removal as indicated. Pavement and slabs designated to be recycled and utilized in this project shall be moved, ground and stored as directed by the Contracting Officer. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.1.5 Roofing

Remove existing roof system and associated components in their entirety down to existing roof deck. Sequence work to minimize building exposure between demolition or deconstruction and new roof materials installation.

3.1.5.1 Temporary Roofing

Install temporary roofing and flashing as necessary to maintain a watertight condition throughout the course of the work. Remove temporary work prior to installation of permanent roof system materials unless approved otherwise by the Contracting Officer.

3.1.5.2 Reroofing

When removing the existing roofing system from the roof deck, remove only as much roofing as can be recovered by the end of the work day, unless approved otherwise by the Contracting Officer. Do not attempt to open the roof covering system in threatening weather. Reseal all openings prior to suspension of work the same day.

3.1.6 Masonry

Sawcut and remove masonry so as to prevent damage to surfaces to remain and to facilitate the installation of new work. Where new masonry adjoins existing, the new work shall abut or tie into the existing construction as specified for the new work. Provide square, straight edges and corners where existing masonry adjoins new work and other locations. .

3.1.7 Concrete

Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

3.1.8 Structural Steel

Dismantle structural steel at field connections and in a manner that will prevent bending or damage. Salvage for recycle structural steel, steel joists, girders, angles, plates, columns and shapes. Flame-cutting torches are permitted when other methods of dismantling are not practical. Transport steel joists and girders as whole units and not dismantled. Transport structural steel shapes to a designated area as directed by the Contracting Officer, stacked according to size, type of member and length, and stored off the ground, protected from the weather.

3.1.9 Miscellaneous Metal

Salvage shop-fabricated items such as access doors and frames, steel gratings, metal ladders, wire mesh partitions, metal railings, metal windows and similar items as whole units. Salvage light-gage and cold-formed metal framing, such as steel studs, steel trusses, metal gutters, roofing and siding, metal toilet partitions, toilet accessories and similar items. Scrap metal shall become the Contractor's property. Recycle scrap metal as part of demolition and deconstruction operations. Provide separate containers to collect scrap metal and transport to a scrap metal collection or recycling facility, in accordance with the Waste Management Plan.

3.1.10 Carpentry

Salvage for recycle lumber, millwork items, and finished boards, and sort by type and size. windows, doors, frames, and cabinets, and similar items as whole units, complete with trim and accessories. Brace the open end of door frames to prevent damage.

3.1.11 Carpet

Remove existing carpet for reclamation in accordance with manufacturer recommendations and as follows. Remove used carpet in large pieces, roll tightly, and pack neatly in a container. Remove adhesive according to recommendations of the Carpet and Rug Institute (CRI). Adhesive removal solvents shall comply with CRI CIS. Recycle removed carpet cushion.

3.1.12 Acoustic Ceiling Tile

Remove, neatly stack, and recycle acoustic ceiling tiles. Recycling may be available with manufacturer. Otherwise, priority shall be given to a local recycling organization. Recycling is not required if the tiles contain or may have been exposed to asbestos material.

3.1.13 Patching

Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces, using on-site materials when available. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

a. Concrete and Masonry: Completely fill holes and depressions, caused by previous physical damage or left as a result of removals in existing masonry walls to remain, with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

b. Where existing partitions have been removed leaving damaged or missing resilient tile flooring, patch to match the existing floor tile.

c. Patch acoustic lay-in ceiling where partitions have been removed. The transition between the different ceiling heights shall be effected by continuing the higher ceiling level over to the first runner on the lower ceiling and closing the vertical opening with a painted sheet metal strip.

3.1.14 Air Conditioning Equipment

Remove air conditioning, refrigeration, and other equipment containing refrigerants without releasing chlorofluorocarbon refrigerants to the atmosphere in accordance with the Clean Air Act Amendment of 1990. Recover all refrigerants prior to removing air conditioning, refrigeration, and other equipment containing refrigerants and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.15 Cylinders and Canisters

Remove all fire suppression system cylinders and canisters and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.16 Locksets on Swinging Doors

Remove all locksets from all swinging doors indicated to be removed and disposed of. Deliver the locksets and related items to a designated location for receipt by the Contracting Officer after removal.

3.1.17 Mechanical Equipment and Fixtures

Disconnect mechanical hardware at the nearest connection to existing services to remain, unless otherwise noted. Disconnect mechanical equipment and fixtures at fittings. Remove service valves attached to the

unit. Salvage each item of equipment and fixtures as a whole unit; listed, indexed, tagged, and stored. Salvage each unit with its normal operating auxiliary equipment. Transport salvaged equipment and fixtures, including motors and machines, to a designated on station storage area as directed by the Contracting Officer. Do not remove equipment until approved. Do not offer low-efficiency equipment for reuse.

3.1.17.1 Preparation for Storage

Remove water, dirt, dust, and foreign matter from units; tanks, piping and fixtures shall be drained; interiors, if previously used to store flammable, explosive, or other dangerous liquids, shall be steam cleaned. Seal openings with caps, plates, or plugs. Secure motors attached by flexible connections to the unit. Change lubricating systems with the proper oil or grease.

3.1.17.2 Piping

Disconnect piping at unions, flanges and valves, and fittings as required to reduce the pipe into straight lengths for practical storage. Store salvaged piping according to size and type. If the piping that remains can become pressurized due to upstream valve failure, end caps, blind flanges, or other types of plugs or fittings with a pressure gage and bleed valve shall be attached to the open end of the pipe to ensure positive leak control. Carefully dismantle piping that previously contained gas, gasoline, oil, or other dangerous fluids, with precautions taken to prevent injury to persons and property. Store piping outdoors until all fumes and residues are removed. Box prefabricated supports, hangers, plates, valves, and specialty items according to size and type. Wrap sprinkler heads individually in plastic bags before boxing. Classify piping not designated for salvage, or not reusable, as scrap metal.

3.1.17.3 Ducts

Classify removed duct work as scrap metal.

3.1.17.4 Fixtures, Motors and Machines

Remove and salvage fixtures, motors and machines associated with plumbing, heating, air conditioning, refrigeration, and other mechanical system installations. Salvage, box and store auxiliary units and accessories with the main motor and machines. Tag salvaged items for identification, storage, and protection from damage. Classify broken, damaged, or otherwise unserviceable units and not caused to be broken, damaged, or otherwise unserviceable as debris to be disposed of by the Contractor.

3.1.18 Electrical Equipment and Fixtures

Salvage motors, motor controllers, and operating and control equipment that are attached to the driven equipment. Salvage wiring systems and components. Box loose items and tag for identification. Disconnect primary, secondary, control, communication, and signal circuits at the point of attachment to their distribution system.

3.1.18.1 Fixtures

Remove and salvage electrical fixtures. Salvage unprotected glassware from the fixture and salvage separately. Salvage incandescent, mercury-vapor, and fluorescent lamps and fluorescent ballasts manufactured prior to 1978,

boxed and tagged for identification, and protected from breakage.

3.1.18.2 Electrical Devices

Remove and salvage switches, switchgear, transformers, conductors including wire and nonmetallic sheathed and flexible armored cable, regulators, meters, instruments, plates, circuit breakers, panelboards, outlet boxes, and similar items. Box and tag these items for identification according to type and size.

3.1.18.3 Wiring Ducts or Troughs

Remove and salvage wiring ducts or troughs. Dismantle plug-in ducts and wiring troughs into unit lengths. Remove plug-in or disconnecting devices from the busway and store separately.

3.1.18.4 Conduit and Miscellaneous Items

Salvage conduit except where embedded in concrete or masonry. Consider corroded, bent, or damaged conduit as scrap metal. Sort straight and undamaged lengths of conduit according to size and type. Classify supports, knobs, tubes, cleats, and straps as debris to be removed and disposed.

3.1.19 Elevators and Hoists

Remove elevators, hoists, and similar conveying equipment and salvage as whole units, to the most practical extent. Remove and prepare items for salvage without damage to any of the various parts. Salvage and store rails for structural steel with the equipment as an integral part of the unit.

3.1.20 Items With Unique/Regulated Disposal Requirements

Remove and dispose of items with unique or regulated disposal requirements in the manner dictated by law or in the most environmentally responsible manner.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition or deconstruction work in areas occupied by structures to be demolished or deconstructed until all demolition and deconstruction in the area has been completed and debris removed. Fill holes, open basements and other hazardous openings.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition, deconstruction, and removal procedures, and authorization by the Contracting Officer to begin demolition and deconstruction. The Government will not be responsible for

the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.2 Reuse of Materials and Equipment

Remove and store materials and equipment listed in the Demolition or Deconstruction Plan to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.3.3 Salvaged Materials and Equipment

Remove materials and equipment that are listed in the Demolition or Deconstruction Plan to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site .

a. Salvage items and material to the maximum extent possible.

b. Store all materials salvaged for the Contractor as approved by the Contracting Officer and remove from Government property before completion of the contract. On site sales of salvaged material is prohibited.

c. Remove salvaged items to remain the property of the Government in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers. Deliver the following items reserved as property of the Government to the areas designated: .

d. Remove the following items reserved as property of the using service prior to commencement of work under this contract: .

e. Remove historical items in a manner to prevent damage. Deliver the following historical items to the Government for disposition: Corner stones, contents of corner stones, and document boxes wherever located on the site.

f. Remove and capture all Class I ODS refrigerants in accordance with the Clean Air Act Amendment of 1990, and turn in to the Navy as directed by the Commanding Officer.

3.3.4 Disposal of Ozone Depleting Substance (ODS)

Class I and Class II ODS are defined in Section, 602(a) and (b), of The Clean Air Act. Prevent discharge of Class I and Class II ODS to the atmosphere. Place recovered ODS in cylinders meeting AHRI Guideline K suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. Recovered ODS shall be . Products, equipment and appliances containing ODS in a sealed, self-contained system (e.g. residential refrigerators and window air conditioners) shall be disposed of in accordance with 40 CFR 82. Submit Receipts or bills of lading, as specified. Submit a shipping receipt or bill of lading for all containers of ozone depleting substance (ODS) shipped to the Defense Depot, Richmond, Virginia.

3.3.4.1 Special Instructions

No more than one type of ODS is permitted in each container. A warning/hazardous label shall be applied to the containers in accordance with Department of Transportation regulations. All cylinders including but not limited to fire extinguishers, spheres, or canisters containing an ODS shall have a tag with the following information:

a. Activity name and unit identification code

b. Activity point of contact and phone number

c. Type of ODS and pounds of ODS contained

d. Date of shipment

e. National stock number (for information, call (804) 279-4525).

3.3.4.2 Fire Suppression Containers

Deactivate fire suppression system cylinders and canisters with electrical charges or initiators prior to shipment. Also, safety caps must be used to cover exposed actuation mechanisms and discharge ports on these special cylinders.

3.3.5 Transportation Guidance

Ship all ODS containers in accordance with MIL-STD-129, DLA 4145.25 (also referenced one of the following: Army Regulation 700-68, Naval Supply Instruction 4440.128C, Marine Corps Order 10330.2C, and Air Force Regulation 67-12), 49 CFR 173.301, and DOD 4000.25-1-M.

3.3.6 Unsalvageable and Non-Recyclable Material

Dispose of unsalvageable and non-recyclable noncombustible material in the disposal area located . The fill in the disposal area shall remain below elevation and after disposal is completed, the disposal area shall be uniformly graded to drain. Dispose of unsalvageable and non-recyclable combustible material in the sanitary fill area located off the site .

3.4 CLEANUP

Remove debris and rubbish from basement and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified in the Waste Management Plan .

3.5.2 Burning on Government Property

Burning of materials removed from demolished and deconstructed structures will not be permitted on Government property .

3.5.3 Removal to Spoil Areas on Government Property

Transport noncombustible materials removed from demolition and deconstruction structures to designated spoil areas on Government property.

3.5.4 Removal from Government Property

Transport waste materials removed from demolished and deconstructed structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

3.6 REUSE OF SALVAGED ITEMS

Recondition salvaged materials and equipment designated for reuse before installation. Replace items damaged during removal and salvage operations or restore them as necessary to usable condition.

-- End of Section --

SECTION 02 82 16.00 20

ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS
08/11

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE Z9.2	(2012) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

ASTM INTERNATIONAL (ASTM)

ASTM C732	(2006; R 2012) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D2794	(1993; R 2010) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D522/D522M	(2014) Mandrel Bend Test of Attached Organic Coatings
ASTM E119	(2012a) Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM E1368	(2014) Visual Inspection of Asbestos Abatement Projects
ASTM E1494	(2012) Encapsulants for Spray- or Trowel-Applied Friable Asbestos-Containing Building Materials
ASTM E736	(2000; R 2011) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E84	(2013a) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E96/E96M	(2013) Standard Test Methods for Water Vapor Transmission of Materials

STATE OF VIRGINIA ADMINISTRATIVE CODE (VAC)

16 VAC 25-20-30	Title 16, Agency 25, Chapter 20, Section 30: Notification and Permit Fee

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 560/5-85-024	(1985) Guidance for Controlling Asbestos-Containing Materials in Buildings (Purple Book)

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

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.1101	Asbestos
29 CFR 1926.200	Accident Prevention Signs and Tags
29 CFR 1926.51	Sanitation
29 CFR 1926.59	Hazard Communication
40 CFR 61-SUBPART A	General Provisions
40 CFR 61-SUBPART M	National Emission Standard for Asbestos
40 CFR 763	Asbestos

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

ND OPNAVINST 5100.23	(2005; Rev G) Navy Occupational Safety and Health (NAVOSH) Program Manual

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 ACM

Asbestos Containing Materials.

1.2.2 Amended Water

Water containing a wetting agent or surfactant with a maximum surface tension of 0.00042 psi.

1.2.3 Area Sampling

Sampling of asbestos fiber concentrations which approximates the concentrations of asbestos in the theoretical breathing zone but is not actually collected in the breathing zone of an employee.

1.2.4 Asbestos

The term asbestos includes chrysotile, amosite, crocidolite, tremolite

asbestos, anthophyllite asbestos, and actinolite asbestos and any of these minerals that has been chemically treated or altered. Materials are considered to contain asbestos if the asbestos content of the material is determined to be at least one percent.

1.2.5 Asbestos Control Area

That area where asbestos removal operations are performed which is isolated by physical boundaries which assist in the prevention of the uncontrolled release of asbestos dust, fibers, or debris.

1.2.6 Asbestos Fibers

Those fibers having an aspect ratio of at least 3:1 and longer than 5 micrometers as determined by National Institute for Occupational Safety and Health (NIOSH) Method 7400.

1.2.7 Asbestos Permissible Exposure Limit

0.1 fibers per cubic centimeter of air as an 8-hour time weighted average measured in the breathing zone as defined by 29 CFR 1926.1101 or other Federal legislation having legal jurisdiction for the protection of workers health.

1.2.8 Background

The ambient airborne asbestos concentration in an uncontaminated area as measured prior to any asbestos hazard abatement efforts. Background concentrations for other (contaminated) areas are measured in similar but asbestos free locations.

1.2.9 Contractor

The Contractor is that individual, or entity under contract to the Navy to perform the herein listed work.

1.2.10 Competent Person

A person meeting the requirements for competent person as specified in 29 CFR 1926.1101 including a person capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, and is specifically trained in a training course which meet the criteria of EPA's Model Accreditation Plan (40 CFR 763) for project designer or supervisor, or its equivalent. The competent person shall have a current State of Hawaii asbestos contractors or supervisors license.

1.2.11 Encapsulation

The abatement of an asbestos hazard through the appropriate use of chemical encapsulants.

1.2.12 Encapsulants

Specific materials in various forms used to chemically or physically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There are four types of encapsulants as follows which must comply with performance requirements as specified herein.

a. Removal Encapsulant (can be used as a wetting agent)

b. Bridging Encapsulant (used to provide a tough, durable surface coating to asbestos containing material)

c. Penetrating Encapsulant (used to penetrate the asbestos containing material encapsulating all asbestos fibers and preventing fiber release due to routine mechanical damage)

d. Lock-Down Encapsulant (used to seal off or "lock-down" minute asbestos fibers left on surfaces from which asbestos containing material has been removed).

1.2.13 Friable Asbestos Material

One percent asbestos containing material that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

1.2.14 Glovebag Technique

Those asbestos removal and control techniques put forth in 29 CFR 1926.1101 Appendix G.

1.2.15 HEPA Filter Equipment

High efficiency particulate air (HEPA) filtered vacuum and/or exhaust ventilation equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall retain 99.97 percent of particles 0.3 microns or larger as indicated in UL 586.

1.2.16 Navy Consultant (NC)

That qualified person employed directly by the Government to monitor, sample, inspect the work or in some other way advise the Contracting Officer. The NC is normally a private consultant, but can be an employee of the Government.

1.2.17 Negative Pressure Enclosure (NPE)

That engineering control technique described as a negative pressure enclosure in 29 CFR 1926.1101.

1.2.18 Nonfriable Asbestos Material

Material that contains asbestos in which the fibers have been immobilized by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not normally release asbestos fibers during any appropriate use, handling, storage or transportation. It is understood that asbestos fibers may be released under other conditions such as demolition, removal, or mishap.

1.2.19 Personal Sampling

Air sampling which is performed to determine asbestos fiber concentrations within the breathing zone of a specific employee, as performed in accordance with 29 CFR 1926.1101.

1.2.20 Private Qualified Person (PQP)

That qualified person hired by the Contractor to perform the herein listed tasks.

1.2.21 Qualified Person (QP)

A Registered Architect, Professional Engineer, Certified Industrial Hygienist, consultant or other qualified person who has successfully completed training and is therefore accredited under a legitimate State Model Accreditation Plan as described in 40 CFR 763 as a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer; and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The QP must be qualified to perform visual inspections as indicated in ASTM E1368. The QP shall be appropriately licensed in the State of Hawaii.

1.2.22 TEM

Refers to Transmission Electron Microscopy.

1.2.23 Time Weighted Average (TWA)

The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers.

1.2.24 Wetting Agent

A chemical added to water to reduce the water's surface tension thereby increasing the water's ability to soak into the material to which it is applied. An equivalent wetting agent must have a surface tension of at most 0.00042 psi.

1.3 REQUIREMENTS

1.3.1 Description of Work

The work covered by this section includes the handling and control of asbestos containing materials and describes some of the resultant procedures and equipment required to protect workers, the environment and occupants of the building or area, or both, from contact with airborne asbestos fibers. The work also includes the disposal of any asbestos containing materials generated by the work. More specific operational procedures shall be outlined in the Asbestos Hazard Abatement Plan called for elsewhere in this specification. The asbestos work includes the demolition and removal or encapsulation of Asbestos Containing Materials (ACM)which is governed by 40 CFR 763. Under normal conditions non-friable or chemically bound materials containing asbestos would not be considered hazardous; however, this material may release airborne asbestos fibers during demolition and removal and therefore must be handled in accordance with the removal and disposal procedures as specified herein. Provide negative pressure enclosure techniques as outlined in this specification. The Navy will evacuate the work area during the asbestos abatement work. All asbestos removal work shall be supervised by a competent person as specified herein.

1.3.1.1 Wallboard/Joint Compound

Both composite samples of the wallboard and discrete samples of the components (wallboard and joint compound) have been tested and results are attached as indicated in each task order.

1.3.2 Medical Requirements

Provide medical requirements including but not limited to medical surveillance and medical record keeping as listed in 29 CFR 1926.1101.

1.3.2.1 Medical Examinations

Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1926.1101 or other pertinent State or local directives. This requirement must have been satisfied within the 12 months prior to the start of work on this contract. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. Specifically identify x-ray films of asbestos workers to the consulting radiologist and mark medical record jackets with the word "ASBESTOS."

1.3.2.2 Medical Records

Maintain complete and accurate records of employees' medical examinations, medical records, and exposure data for a period of 50 years after termination of employment and make records of the required medical examinations and exposure data available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health (OSHA), or authorized representatives of them, and an employee's physician upon the request of the employee or former employee.

1.3.3 Employee Training

Submit certificates, prior to the start of work but after the main abatement submittal, signed by each employee indicating that the employee has received training in the proper handling of materials and wastes that contain asbestos in accordance with 40 CFR 763; understands the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of the respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in 29 CFR 1926.1101 on an initial and annual basis. Certificates shall be organized by individual worker, not grouped by type of certification. Post appropriate evidence of compliance with the training requirements of 40 CFR 763. Train all personnel involved in the asbestos control work in accordance with United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) training criteria or State training criteria whichever is more stringent. The Contractor shall document the training by providing: dates of training, training entity, course outline, names of instructors, and qualifications of instructors upon request by the Contracting Officer. Furnish each employee with respirator training and fit testing administered by the PQP as required by 29 CFR 1926.1101. Fully cover engineering and other hazard control techniques and procedures. All asbestos workers shall

have a current State of Hawaii asbestos worker's license.

1.3.4 Permits , Licenses, and Notifications

Obtain necessary permits and licenses in conjunction with asbestos removal, encapsulation, hauling, and disposition, and furnish notification of such actions required by Federal, State, regional, and local authorities prior to the start of work. Notify the State's environmental protection agency and the Contracting Officer in writing 20 working days prior to commencement of work in accordance with 40 CFR 61-SUBPART M and 16 VAC 25-20-30. Notify the Contracting Officer and other appropriate Government agencies in writing 20 working days prior to the start of asbestos work as indicated in applicable laws, ordinances, criteria, rules, and regulations. Submit copies of all Notifications to the Contracting Officer. Notify the local fire department 3 days prior to removing fire-proofing material from the building including notice that the material contains asbestos.

1.3.5 Environment, Safety and Health Compliance

In addition to detailed requirements of this specification, comply with those applicable laws, ordinances, criteria, rules, and regulations of Federal, State, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.1101, 40 CFR 61-SUBPART A, 40 CFR 61-SUBPART M, and ND OPNAVINST 5100.23. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the Government shall apply. The following laws, ordinances, criteria, rules and regulations regarding removal, handling, storing, transporting and disposing of asbestos materials.

1.3.6 Respiratory Protection Program

Establish and implement a respirator program as required by AIHA Z88.6, 29 CFR 1926.1101, and 29 CFR 1926.103. Submit a written description of the program to the Contracting Officer. Submit a written program manual or operating procedure including methods of compliance with regulatory statutes.

1.3.6.1 Respirator Program Records

Submit records of the respirator program as required by AIHA Z88.6, 29 CFR 1926.103, and 29 CFR 1926.1101.

1.3.7 Asbestos Hazard Control Supervisor

The Contractor shall be represented on site by a supervisor, trained using the model Contractor accreditation plan as indicated in the Federal statutes for all portions of the herein listed work.

1.3.8 Hazard Communication

Adhere to all parts of 29 CFR 1926.59 and provide the Contracting Officer with a copy of the Material Safety Data Sheets (MSDS) for all materials brought to the site.

1.3.9 Asbestos Hazard Abatement Plan

Submit a detailed plan of the safety precautions such as lockout, tagout, tryout, fall protection, and confined space entry procedures and equipment and work procedures to be used in the encapsulation, removal, and/or demolition of materials containing asbestos. The plan, not to be combined with other hazard abatement plans, shall be prepared, signed, and sealed by the PQP. Provide a Table of Contents for each abatement submittal, which shall follow the sequence of requirements in the contract. Such plan shall include but not be limited to the precise personal protective equipment to be used including, but not limited to, respiratory protection, type of whole-body protection and if reusable coveralls are to be employed decontamination methods (operations and quality control plan), the location of asbestos control areas including clean and dirty areas, buffer zones, showers, storage areas, change rooms, removal and/or encapsulation method, interface of trades involved in the construction, sequencing of asbestos related work, disposal plan, type of wetting agent and asbestos sealer to be used, locations of local exhaust equipment, planned air monitoring strategies, and a detailed description of the method to be employed in order to control environmental pollution. The plan shall also include (both fire and medical emergency) response plans. The Asbestos Hazard Abatement Plan must be approved in writing prior to starting any asbestos work. The Contractor, Asbestos Hazard Control Supervisor, and PQP shall meet with the Contracting Officer prior to beginning work, to discuss in detail the Asbestos Hazard Abatement Plan, including work procedures and safety precautions. Once approved by the Contracting Officer, the plan will be enforced as if an addition to the specification. Any changes required in the specification as a result of the plan shall be identified specifically in the plan to allow for free discussion and approval by the Contracting Officer prior to starting work.

1.3.10 Testing Laboratory

Submit the name, address, and telephone number of each testing laboratory selected for the sampling, analysis, and reporting of airborne concentrations of asbestos fibers along with evidence that each laboratory selected holds the appropriate State license and/or permits and certification that each laboratory is American Industrial Hygiene Association (AIHA) accredited and that persons counting the samples have been judged proficient by current inclusion on the AIHA Asbestos Analysis Registry (AAR) and successful participation of the laboratory in the Proficiency Analytical Testing (PAT) Program. Where analysis to determine asbestos content in bulk materials or transmission electron microscopy is required, submit evidence that the laboratory is accredited by the National Institute of Science and Technology (NIST) under National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis. The testing laboratory firm shall be independent of the asbestos contractor and shall have no employee or employer relationship which could constitute a conflict of interest.

1.3.11 Landfill Approval

Submit written evidence that the landfill is for asbestos disposal by the U.S. Environmental Protection Agency, Region 3, Air Enforcement Section (38W12), and local regulatory agencies. Within 3 working days after delivery, submit detailed delivery tickets, prepared, signed, and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill. Submit a copy of the waste shipment records within 1 day of the shipment leaving the project site.

1.3.12 Medical Certification

Provide a written certification for each worker and supervisor, signed by a licensed physician indicating that the worker and supervisor has met or exceeded all of the medical prerequisites listed herein and in 29 CFR 1926.1101 and 29 CFR 1926.103 as prescribed by law. Submit certificates prior to the start of work but after the main abatement submittal.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Local exhaust equipment; G

Vacuums; G

Respirators; G

Pressure differential automatic recording instrument; G

Amended water; G

Glovebags; G

Material Safety Data Sheets (MSDS) for all materials proposed for transport to the project site; G

Encapsulants; G

SD-06 Test Reports

Air sampling results; G

Pressure differential recordings for local exhaust system; G

Asbestos disposal quantity report; G

Encapsulation test patches; G

Clearance sampling; G

SD-07 Certificates

Asbestos hazard abatement plan; G

Testing laboratory; G

Private qualified person documentation; G

Contractor's license; G

Competent person documentation; G

Worker's license; G

Landfill approval; G

Employee training; G

Medical certification requirements; G

Waste shipment records and if applicable exemption report; G

Respiratory Protection Program; G

Delivery tickets; G

Vacuums; G

Water filtration equipment; G

Ventilation systems; G

Other equipment used to contain airborne asbestos fibers; G

Chemical encapsulants sealers;; G

Notifications

Show compliance with ASSE Z9.2 by providing manufacturers' certifications.

SD-11 Closeout Submittals

Notifications; G

Rental equipment; G

Respirator program records; G

Permits and licenses

Protective clothing decontamination quality control records; G

Protective clothing decontamination facility notification; G

1.5 QUALITY ASSURANCE

1.5.1 Private Qualified Person Documentation

Submit the name, address, and telephone number of the Private Qualified Person (PQP) selected to prepare the Asbestos Hazard Abatement Plan, direct monitoring and training, and documented evidence that the PQP has successfully completed training in and is accredited and where required is certified as, a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer as described by 40 CFR 763 and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The PQP shall be appropriately licensed in the State of Hawaii. The PQP and the asbestos contractor shall not have an employee/employer relationship or financial relationship which could

constitute a conflict of interest. The PQP shall be a first tier subcontractor.

1.5.2 Competent Person Documentation

Submit training certification and a current State of Hawaii Asbestos Contractor's and Supervisor's License.

1.5.3 Worker's License

Submit documentation that requires all workers have a current State of Hawaii Asbestos Workers License.

1.5.4 Contractor's License

Contractor shall have current asbestos contractor's license. Submit a copy of the asbestos contractor's license issued by the State of Hawaii.

1.5.5 Air Sampling Results

Complete fiber counting and provide results to the PQP and NC for review within 16 hours of the "time off" of the sample pump. Notify the Contracting Officer immediately of any airborne levels of asbestos fibers in excess of the acceptable limits. Submit sampling results to the Contracting Officer and the affected Contractor employees where required by law within 3 working days, signed by the testing laboratory employee performing air sampling, the employee that analyzed the sample, and the PQP and NC. Notify the Contractor and the Contracting Officer immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.01 fibers per cubic centimeter or background whichever is higher. In no circumstance shall levels exceed 0.1 fibers per cubic centimeter.

1.5.6 Pressure Differential Recordings for Local Exhaust System

Provide a local exhaust system that creates a negative pressure of at least 0.02 inches of water relative to the pressure external to the enclosure and operate it continuously, 24 hours a day, until the temporary enclosure of the asbestos control area is removed. Submit pressure differential recordings for each work day to the PQP and NC for review and to the Contracting Officer within 24 hours from the end of each work day.

1.5.7 Protective Clothing Decontamination Quality Control Records

Provide all records that document quality control for the decontamination of reusable outer protective clothing.

1.5.8 Protective Clothing Decontamination Facility Notification

Submit written evidence that persons who decontaminate, store, or transport asbestos contaminated clothing used in the performance of this contract were duly notified in accordance with 29 CFR 1926.1101.

1.6 EQUIPMENT

1.6.1 Rental Equipment

Provide a copy of the written notification to the rental company concerning the intended use of the equipment and the possibility of asbestos

contamination of the equipment.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Shall conform to current USEPA requirements, shall contain no toxic or hazardous substances as defined in 29 CFR 1926.59, and shall conform to the following performance requirements.

2.1.1 Removal Encapsulants

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.2 Bridging Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test

Requirement	Test Standard
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.3 Penetrating Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Cohesion/Adhesion Test - 50 pounds of force/foot	ASTM E119
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.4 Lock-down Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E119

Requirement	Test Standard
Bond Strength: 100 pounds of force/foot	ASTM E736
(Tests compatibility with cementitious and fibrous fireproofing)	

PART 3 EXECUTION

3.1 EQUIPMENT

At all times, provide the Contracting Officer or the Contracting Officer's Representative, with at least two complete sets of personal protective equipment as required for entry to and inspection of the asbestos control area. Provide equivalent training to the Contracting Officer or a designated representative as provided to Contractor employees in the use of the required personal protective equipment. Provide manufacturer's certificate of compliance for all equipment used to contain airborne asbestos fibers.

3.1.1 Respirators

Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

3.1.1.1 Respirators for Handling Asbestos

Provide personnel engaged in pre-cleaning, cleanup, handling, encapsulation removal and or demolition of asbestos materials with respiratory protection as indicated in 29 CFR 1926.1101 and 29 CFR 1926.103.

3.1.2 Exterior Whole Body Protection

3.1.2.1 Outer Protective Clothing

Provide personnel exposed to asbestos with disposable "non-breathable," or reusable "non-breathable" whole body outer protective clothing, head coverings, gloves, and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Make sleeves secure at the wrists, make foot coverings secure at the ankles, and make clothing secure at the neck by the use of tape. Reusable whole body outer protective clothing shall be either disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area or be properly decontaminated.

3.1.2.2 Work Clothing

Provide cloth work clothes for wear under the outer protective clothing and foot coverings and either dispose of or properly decontaminate them as recommended by the PQP after each use.

3.1.2.3 Personal Decontamination Unit

Provide a temporary, negative pressure unit with a separate decontamination

locker room and clean locker room with a shower that complies with 29 CFR 1926.51(f)(4)(ii) through (V) in between for personnel required to wear whole body protective clothing. Provide two separate lockers for each asbestos worker, one in each locker room. Keep street clothing and street shoes in the clean locker. HEPA vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators at the boundary of the asbestos work area and seal in impermeable bags or containers for disposal. HEPA vacuum and remove asbestos contaminated reusable protective clothing while still wearing respirators at the boundary of the asbestos work area, seal in two impermeable bags, label outer bag as asbestos contaminated waste, and transport for decontamination.

Do not wear work clothing between home and work. Locate showers between the decontamination locker room and the clean locker room and require that all employees shower before changing into street clothes. Collect used shower water and filter with approved water filtration equipment to remove asbestos contamination. Dispose of filters and residue as asbestos waste. Discharge clean water to the sanitary system. Dispose of asbestos contaminated work clothing as asbestos contaminated waste or properly decontaminate as specified in the Contractor's Asbestos Hazard Abatement Plan. Decontamination units shall be physically attached to the asbestos control area. Build both a personnel decontamination unit and an equipment decontamination unit onto and integral with each asbestos control area.

3.1.2.4 Decontamination of Reusable Outer Protective Clothing

When reusable outer protective clothing is used, transport the double bagged clothing to a previously notified commercial/industrial decontamination facility for decontamination. Perform non-destructive testing to determine the effectiveness of asbestos decontamination. If representative sampling is used, ensure the statistical validity of the sampling results. If representative sampling is used, reject any entire batch in which any of the pieces exceed 40 fibers per square millimeter. Inspect reusable protective clothing prior to use to ensure that it will provide adequate protection and is not or is not about to become ripped, torn, deteriorated, or damaged, and that it is not visibly contaminated. Notify, in writing, all personnel involved in the decontamination of reusable outer protective clothing as indicated in 29 CFR 1926.1101.

3.1.2.5 Eye Protection

Provide goggles to personnel engaged in asbestos abatement operations when the use of a full face respirator is not required.

3.1.3 Warning Signs and Labels

Provide warning signs at all approaches to asbestos control areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.

3.1.3.1 Warning Sign

Provide vertical format conforming to 29 CFR 1926.200, and 29 CFR 1926.1101 minimum 20 by 14 inches displaying the following legend in the lower panel:

Legend	Notation
Danger	one inch Sans Serif Gothic or Block
Asbestos	one inch Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	1/4 inch Sans Serif Gothic or Block
Authorized Personnel Only	1/4 inch Sans Serif Gothic or Block
Respirators and Protective Clothing are Required in this Area	1/4 inch Sans Serif Gothic or Block

Spacing between lines shall be at least equal to the height of the upper of any two lines.

3.1.3.2 Warning Labels

Provide labels conforming to 29 CFR 1926.1101 of sufficient size to be clearly legible, displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM

3.1.4 Local Exhaust System

Provide a local exhaust system in the asbestos control area in accordance with ASSE Z9.2 and 29 CFR 1926.1101 that will provide at least four air changes per hour inside of the negative pressure enclosure. Local exhaust equipment shall be operated 24 hours per day, until the asbestos control area is removed and shall be leak proof to the filter and equipped with HEPA filters. Maintain a minimum pressure differential in the control area of minus 0.02 inch of water column relative to adjacent, unsealed areas. Provide continuous 24-hour per day monitoring of the pressure differential with a pressure differential automatic recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control area. Filters on exhaust equipment shall conform to ASSE Z9.2 and UL 586. The local exhaust system shall terminate out of doors and remote from any public access or ventilation system intakes.

3.1.5 Tools

Vacuums shall be leak proof to the filter and equipped with HEPA filters.

Filters on vacuums shall conform to ASSE Z9.2 and UL 586. Do not use power tools to remove asbestos containing materials unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation systems. Remove all residual asbestos from reusable tools prior to storage or reuse.

3.1.6 Rental Equipment

If rental equipment is to be used, furnish written notification to the rental agency concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

3.1.7 Glovebags

Submit written manufacturers proof that glovebags will not break down under expected temperatures and conditions.

3.2 WORK PROCEDURE

Perform asbestos related work in accordance with 29 CFR 1926.1101, 40 CFR 61-SUBPART M, and as specified herein. Use wet or if given prior EPA approval, dry removal procedures appropriate encapsulation procedures as listed in the asbestos hazard abatement plan and negative pressure enclosure techniques. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, drinking, chewing gum, tobacco, or applying cosmetics shall not be permitted in the asbestos work or control areas. Personnel of other trades not engaged in the encapsulation removal and demolition of asbestos containing material shall not be exposed at any time to airborne concentrations of asbestos unless all the personnel protection and training provisions of this specification are complied with by the trade personnel. Seal all roof top penetrations, except plumbing vents, prior to asbestos roofing work. Shut down the building heating, ventilating, and air conditioning system, cap the openings to the system, and provide temporary ventilation, prior to the commencement of asbestos work. Disconnect electrical service when encapsulation wet removal is performed and provide temporary electrical service with verifiable ground fault circuit interrupter (GFCI) protection prior to the use of any water encapsulant. If an asbestos fiber release or spill occurs outside of the asbestos control area, stop work immediately, correct the condition to the satisfaction of the Contracting Officer including clearance sampling, prior to resumption of work.

3.2.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent work. Where such work is damaged or contaminated as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust, or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, stop work immediately. Then clean up the spill. When satisfactory visual inspection and air sampling results are obtained from the PQP work may proceed at the discretion of the Contracting Officer.

3.2.2 Furnishings

Furniture and equipment will remain in the building. Cover and seal furnishings with 6-mil plastic sheet or remove from the work area and store

in a location on site approved by the Contracting Officer.

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3.2.3 Precleaning

Wet wipe and HEPA vacuum all surfaces potentially contaminated with asbestos prior to establishment of an enclosure.

3.2.4 Asbestos Control Area Requirements

3.2.4.1 Negative Pressure Enclosure

Block and seal openings in areas where the release of airborne asbestos fibers can be expected. Establish an asbestos negative pressure enclosure with the use of curtains, portable partitions, or other enclosures in order to prevent the escape of asbestos fibers from the contaminated asbestos work area. Negative pressure enclosure development shall include protective covering of uncontaminated walls, and ceilings with a continuous membrane of two layers of minimum 6-mil plastic sheet sealed with tape to prevent water or other damage. Provide two layers of 6-mil plastic sheet over floors and extend a minimum of 12 inches up walls. Seal all joints with tape. Provide local exhaust system in the asbestos control area. Openings will be allowed in enclosures of asbestos control areas for personnel and equipment entry and exit, the supply and exhaust of air for the local exhaust system and the removal of properly containerized asbestos containing materials. Replace local exhaust system filters as required to maintain the efficiency of the system.

3.2.4.2 Glovebag

The construction of a negative pressure enclosure is infeasible for the removal and/or encapsulation of Asbestos Containing Materials. Use alternate techniques as indicated in 29 CFR 1926.1101. Establish designated limits for the asbestos regulated area with the use of rope or other continuous barriers, and maintain all other requirements for asbestos control areas. The PQP shall conduct personal samples of each worker engaged in asbestos handling (removal, disposal, transport and other associated work) throughout the duration of the project. If the quantity of airborne asbestos fibers monitored at the breathing zone of the workers at any time exceeds background or 0.01 fibers per cubic centimeter whichever is greater, stop work, evacuate personnel in adjacent areas or provide personnel with approved protective equipment at the discretion of the Contracting Officer. This sampling may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those obtained by the Contractor, the Government will determine which results predominate. If adjacent areas are contaminated as determined by the Contracting Officer, clean the contaminated areas, monitor, and visually inspect the area as specified herein.

3.2.5 Removal Procedures

Wet asbestos material with a fine spray of amended water during removal, cutting, or other handling so as to reduce the emission of airborne fibers. Remove material and immediately place in 6 mil plastic disposal bags. Remove asbestos containing material in a gradual manner, with continuous application of the amended water or wetting agent in such a manner that no asbestos material is disturbed prior to being adequately

wetted. Where unusual circumstances prohibit the use of 6 mil plastic bags, submit an alternate proposal for containment of asbestos fibers to the Contracting Officer for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation, wrap the pipes and insulation in plastic and remove the pipe by sections. Asbestos containing material shall be containerized while wet. At no time shall asbestos material be allowed to accumulate or become dry. Lower and otherwise handle asbestos containing material as indicated in 40 CFR 61-SUBPART M.

3.2.5.1 Sealing Contaminated Items Designated for Disposal

Remove contaminated architectural, mechanical, and electrical appurtenances such as venetian blinds, full-height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit, panels, and other contaminated items designated for removal by completely coating the items with an asbestos lock-down encapsulant at the demolition site before removing the items from the asbestos control area. These items need not be vacuumed. The asbestos lock-down encapsulant shall be tinted a contrasting color. It shall be spray-applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces. Lock-down encapsulants shall comply with the performance requirements specified herein.

3.2.5.2 Exposed Pipe Insulation Edges

Contain edges of asbestos insulation to remain that are exposed by a removal operation. Wet and cut the rough ends true and square with sharp tools and then encapsulate the edges with a 1/4 inch thick layer of non-asbestos containing insulating cement troweled to a smooth hard finish. When cement is dry, lag the end with a layer of non-asbestos lagging cloth, overlapping the existing ends by at least 4 inches. When insulating cement and cloth is an impractical method of sealing a raw edge of asbestos, take appropriate steps to seal the raw edges as approved by the Contracting Officer.

3.2.6 Encapsulation Procedures

3.2.6.1 Preparation of Test Patches

Install three test patches of encapsulant, as indicated. Use airless spray at the lowest pressure and as recommended by the encapsulant manufacturer. Follow exactly the manufacturer's instructions for thinning recommendations, application procedures and rates. Curing time shall be not less than five days or that recommended by the manufacturer, whichever is more. A test patch shall be 9 square feet in size.

3.2.6.2 Field Testing

Field test the encapsulation test patches in accordance with ASTM E1494, paragraph "Required Field Test," in the presence of the Contracting Officer. Keep a written record of the testing procedures and test results. Upon successful testing of the encapsulant, submit a signed statement to the Contracting Officer certifying that the encapsulant is suitable for installation on the particular asbestos containing material.

3.2.6.3 Large-Scale Application

Apply encapsulant using the same equipment and procedures as employed for

the test patches. Keep the encapsulant material stirred to prevent settling. Keep a clean work area. Change pre-filters in the ventilation equipment as soon as they appear clogged by encapsulant aerosol or pressure differential drops below 0.02 Hg.

3.2.7 Air Sampling

Sampling of airborne concentrations of asbestos fibers shall be performed in accordance with 29 CFR 1926.1101 and as specified herein. Sampling performed in accordance with 29 CFR 1926.1101 shall be performed by the PQP. Sampling performed for environmental and quality control reasons shall be performed by the PQP . Unless otherwise specified, use NIOSH Method 7400 for sampling and analysis. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those results obtained by the Contractor, the Government will determine which results predominate.

3.2.7.1 Sampling Prior to Asbestos Work

Provide area air sampling and establish the baseline one day prior to the masking and sealing operations for each demolition, removal, and/or encapsulation site. Establish the background by performing area sampling in similar but uncontaminated sites in the building.

3.2.7.2 Sampling During Asbestos Work

The PQP shall provide personal and area sampling as indicated in 29 CFR 1926.1101 and governing environmental regulations. In addition, provided the same type of work is being performed, provide area sampling at least once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately. Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.

The PQP shall provide personal sampling as indicated in 29 CFR 1926.1101. At the same time the NC will provide area sampling close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. In addition, provided the same type of work is being performed, the NC will provide area sampling once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately. Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.

3.2.7.3 Sampling After Final Clean-Up (Clearance Sampling)

Provide area sampling of asbestos fibers using aggressive air sampling techniques as defined in the EPA 560/5-85-024 and establish an airborne

asbestos concentration of less than 0.01 fibers per cubic centimeter after final clean-up but before removal of the enclosure or the asbestos work control area. After final cleanup and the asbestos control area is dry but prior to clearance sampling, the PQP and NC shall perform a visual inspection in accordance with ASTM E1368 to ensure that the asbestos control and work area is free of any accumulations of dirt, dust, or debris. Prepare a written report signed and dated by the PQP documenting that the asbestos control area is free of dust, dirt, and debris and all waste has been removed. Perform at least three samples. Use transmission electron microscopy (TEM) to analyze clearance samples and report the results in accordance with current NIOSH criteria. The asbestos fiber counts from these samples shall be less than 0.01 fibers per cubic centimeter or be not greater than the background, whichever is greater. Should any of the final samples indicate a higher value, the Contractor shall take appropriate actions to re-clean the area and shall repeat the sampling and TEM analysis at the Contractor's expense.

3.2.8 Lock-Down

Prior to removal of plastic barriers and after pre-clearance clean up of gross contamination, the PQP shall conduct a visual inspection of all areas affected by the removal and/or encapsulation in accordance with ASTM E1368. Inspect for any visible fibers , and to ensure that encapsulants were applied evenly and appropriately. A post removal (lock-down) encapsulant shall then be spray applied to ceiling, walls, floors and other areas exposed in the removal area. The exposed area shall include but not be limited to plastic barriers, furnishings and articles to be discarded as well as dirty change room, air locks for bag removal and decontamination chambers.

3.2.9 Site Inspection

While performing asbestos engineering control work, the Contractor shall be subject to on-site inspection by the Contracting Officer who may be assisted by or represented by safety or industrial hygiene personnel. If the work is found to be in violation of this specification, the Contracting Officer or his representative will issue a stop work order to be in effect immediately and until the violation is resolved. All related costs including standby time required to resolve the violation shall be at the Contractor's expense.

3.3 CLEAN-UP AND DISPOSAL

3.3.1 Housekeeping

Essential parts of asbestos dust control are housekeeping and clean-up procedures. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Give meticulous attention to restricting the spread of dust and debris; keep waste from being distributed over the general area. Use HEPA filtered vacuum cleaners. DO NOT BLOW DOWN THE SPACE WITH COMPRESSED AIR. When asbestos removal is complete, all asbestos waste is removed from the work-site, and final clean-up is completed, the Contracting Officer will attest that the area is safe before the signs can be removed. After final clean-up and acceptable airborne concentrations are attained but before the HEPA unit is turned off and the enclosure removed, remove all pre-filters on the building HVAC system and provide new pre-filters. Dispose of filters as asbestos contaminated materials. Reestablish HVAC mechanical, and electrical systems in proper working order. The Contracting Officer will visually inspect all surfaces within

the enclosure for residual material or accumulated dust or debris. The Contractor shall re-clean all areas showing dust or residual materials. If re-cleaning is required, air sample and establish an acceptable asbestos airborne concentration after re-cleaning. The Contracting Officer must agree that the area is safe in writing before unrestricted entry will be permitted. The Government shall have the option to perform monitoring to determine if the areas are safe before entry is permitted.

3.3.2 Title to Materials

All waste materials, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, State, and Federal regulations and herein.

3.3.3 Disposal of Asbestos

3.3.3.1 Procedure for Disposal

Collect asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 6 mils thick, cartons, drums or cans). Wastes within the containers must be adequately wet in accordance with 40 CFR 61-SUBPART M. Affix a warning and Department of Transportation (DOT) label to each container including the bags or use at least 6 mils thick bags with the approved warnings and DOT labeling preprinted on the bag. The name of the waste generator and the location at which the waste was generated shall be clearly indicated on the outside of each container. Prevent contamination of the transport vehicle (especially if the transport vehicle is a rented truck likely to be used in the future for non-asbestos purposes). These precautions include lining the vehicle cargo area with plastic sheeting (similar to work area enclosure) and thorough cleaning of the cargo area after transport and unloading of asbestos debris is complete. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or State-approved asbestos landfill off Government property. For temporary storage, store sealed impermeable bags in asbestos waste drums or skids. An area for interim storage of asbestos waste-containing drums or skids will be assigned by the Contracting Officer or his authorized representative. Procedure for hauling and disposal shall comply with 40 CFR 61-SUBPART M, State, regional, and local standards. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be recycled. Workers unloading the sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

3.3.3.2 Asbestos Disposal Quantity Report

Direct the PQP to record and report, to the Contracting Officer, the amount of asbestos containing material removed and released for disposal. Deliver the report for the previous day at the beginning of each day shift with amounts of material removed during the previous day reported in linear feet or square feet as described initially in this specification and in cubic feet for the amount of asbestos containing material released for disposal.

-- End of Section --

SECTION 02 82 33.13 20

REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD
08/11

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780	(1995; Errata Aug 1996;Rev Ch. 7 - 1997) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

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

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.33	Access to Employee Exposure and Medical Records
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and

	Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Abatement

As applied to target housing and child occupied facilities, "abatement" means any set of measures designed to permanently eliminate lead-based paint hazards in accordance with standards established by appropriate Federal agencies. Such term includes:

a. The removal of lead-based paint and lead-contaminated dust, the permanent containment or encapsulation of lead-based paint, the replacement of lead-painted surfaces or fixtures, and the removal or covering of lead contaminated soil; and

b. All preparation, cleanup, disposal, and post-abatement clearance testing activities associated with such measures.

1.2.2 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period in a work environment.

1.2.3 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries, which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel.

1.2.4 Child Occupied Facility

A building or portion of a building constructed prior to 1978 visited regularly by the same child, 6 years of age or under, on a least two different days within any week, provided each days visit last at least 3 hours and the combined weekly visit last at least 6 hours and the combined annual visit last at least 60 hours. Child occupied facilities may include, but are not limited to day-care centers, preschools and kindergarten classrooms.

1.2.5 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations. A Certified Industrial Hygienist (CIH) certified for comprehensive practice by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.6 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment (PPE).

1.2.7 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.8 Deleading

Activities conducted by a person who offers to eliminate lead-based paint or lead-based paint hazards or to plan such activities in commercial buildings, bridges or other structures.

1.2.9 Eight-Hour Time Weighted Average (TWA)

Airborne concentration of lead to which an employee is exposed, averaged over an 8 hour workday as indicated in 29 CFR 1926.62.

1.2.10 High Efficiency Particulate Air (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron or larger size particles.

1.2.11 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps.

1.2.12 Lead-Based Paint (LBP)

Paint or other surface coating that contains lead in excess of 1.0 milligrams per centimeter squared or 0.5 percent by weight.

1.2.13 Lead-Based Paint Activities

In the case of target housing or child occupied facilities, lead-based paint activities include; a lead-based paint inspection, a risk assessment, or abatement of lead-based paint hazards.

1.2.14 Lead-Based Paint Hazard (LBP Hazard)

Any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, lead-based paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects.

1.2.15 Paint with Lead (PWL)

Any paint that contains lead as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of lead are found using a quantitative method for analyzing paint using laboratory instruments with specified limits of detection (usually 0.01 percent). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.16 Lead Control Area

A system of control methods to prevent the spread of lead dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.17 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a workday, the PEL shall be determined by the following formula:

PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

1.2.18 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.19 Physical Boundary

Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean the same as "outside lead control area but inside the physical boundary."

1.2.20 Target Housing

Housing constructed prior to 1978. It does not include housing for the elderly, or persons with disabilities unless any one or more children age 6 years and younger resides or is expected to reside in such housing.

1.3 DESCRIPTION

1.3.1 Description of Work

Remove/control lead-based / paint with lead in intact, flaking, chalking, chipped, or peeling condition, as indicated in each task order.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Removal/Control Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead activities.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Vacuum Filters; G

Respirators; G

SD-06 Test Reports

sampling results; G

Occupational and Environmental Assessment Data Report; G

SD-07 Certificates

Qualifications of CP; G

Testing Laboratory qualifications; G

Occupant Notification; G

Training Certification of workers and supervisors; G

Notification of the Commencement of LBP Hazard Abatement; G

Third Party Consultant Qualifications; G

Lead-based paint/paint with lead removal/control plan including CP approval (signature, date, and certification number); G

Rental equipment notification; G

Respiratory Protection Program; G

Hazard Communication Program; G

EPA or State approved hazardous waste treatment, storage, or disposal facility for lead disposal; G

Lead Waste Management Plan; G

Vacuum filters; G

Clearance Certification; G

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility; G

Certification of Medical Examinations; G

Employee Training Certification; G

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Qualifications of CP

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide previous experience of the CP. Submit proper documentation that the CP is trained and licensed and certified in accordance with Federal, State, and local laws.

1.5.1.2 Training Certification

Submit a certificate for each employee and supervisor, signed and dated by the authorized training provider meeting 40 CFR 745 (Subpart L) requirements, stating that the employee or supervisor has received the required lead training and is certified to perform or supervise deleading or lead removal. Submit proof the work will be performed by a certified firm.

1.5.1.3 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the air and wipe and soil sampling, testing, and reporting of airborne concentrations of lead. Use a laboratory accredited under the EPA National Lead Laboratory Accreditation Program (NLLAP) by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.1.4 Third Party Consultant Qualifications

Submit the name, address, and telephone number of the third party consultant selected to perform the wipe sampling for determining concentrations of lead in dust or soil sampling. Submit proper documentation that the consultant is trained and certified as an inspector technician or inspector/risk assessor by the USEPA authorized State (or local) certification and accreditation program.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

a. Verify training meets all federal, State, and local requirements.

b. Review and approve lead-based paint/paint with lead removal/control plan for conformance to the applicable standards. Ensure work is performed in strict accordance with specifications at all times.

c. Continuously inspect lead-based paint removal/control work for conformance with the approved plan.

d. Perform air and wipe sampling.

e. Control work to prevent hazardous exposure to human beings and to the environment at all times.

f. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead-Based Paint/Paint with Lead Removal/Control Plan (LBP/PWL R/CP)

Submit a detailed job-specific plan of the work procedures to be used in the removal/control of LBP/PWL. The plan shall include a sketch showing the location, size, and details of lead control areas, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include a description of equipment and materials, controls and job responsibilities for each activity from which lead is emitted. Include in the plan, eating, drinking, smoking and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and paint debris disposal plan, air sampling plan, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that lead is not released outside the lead control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training, sampling methodology, frequency, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multi-contractor worksites to inform affected employees and to clarify responsibilities to control exposures.

The Removal/Control Plan shall be developed by a certified planner/project designer.

In occupied buildings, the Removal/Control Plan shall also include an occupant protection program that describes the measures that will be taken during the work to protect the building occupants.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

In order to reduce the full implementation of 29 CFR 1926.62, the Contractor shall provide documentation. Submit a report that supports the determination to reduce full implementation of the requirements of 29 CFR 1926.62 and supporting the Lead Removal/Control Plan.

a. The initial monitoring shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the

worker's regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of 29 CFR 1926.62 with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, rivet busting, cleanup of dry expendable abrasives, abrasive blast enclosure removal, abrasive blasting, welding, cutting and torch burning where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the lead compliance plan per 29 CFR 1926.62.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62, and 29 CFR 1926.103. Maintain complete and accurate medical records of employees for a period of at least 30 years or for the duration of employment plus 30 years, whichever is longer.

1.5.2.5 Training

Train each employee performing paint removal, disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. Establish and implement a respiratory protection program as required by AIHA Z88.6, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Lead Waste Management

The Lead Waste Management Plan shall comply with applicable requirements of federal, State, and local hazardous waste regulations and address:

a. Identification and classification of hazardous wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and operator and a 24-hour point of contact. Furnish two copies of proof of EPA State and local hazardous waste permit applications permits manifests and EPA Identification numbers Transporter Number.

d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.

g. Work plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily. Proper containment of the waste includes using acceptable waste containers (e.g., 55-gallon drums) as well as proper marking/labeling of the containers.

h. Unit cost for waste disposal according to this plan.

1.5.2.9 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of Federal, State, and local authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply.

Licensing and certification in the State of Hawaii is required.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the lead waste management plan and the lead-based paint/paint with lead removal/control plan, including work procedures and precautions for the removal plan.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable or uncontaminated, reusable protective whole body clothing, head

covering, gloves, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during lead-based paint handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Furnish a copy of the written notification to the Contracting Officer.

1.6.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the paint removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.

1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform paint removal work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better.

PART 2 PRODUCTS

Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer 20 days prior to the start of any paint removal work.

b. Occupant Notification

Submit occupant written acknowledgment of the delivery of lead hazard information pamphlet (EPA 747-K-99-001 "Protect Your Family From Lead in Your Home") prior to commencing the renovation work for each affected unit per 40 CFR 745 Subpart E.

c. Notification of the Commencement of LBP Hazard Abatement

Submit a copy of the notification of the commencement of LBP hazard abatement according to the procedures established.

3.1.1.2 Boundary Requirements

a. Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Furnishings

Furniture and equipment will remain in the building. Cover and seal furnishings with 6-mil plastic sheet or remove from the work area and store in a location on site approved by the Contracting Officer.

3.1.1.4 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

3.1.1.5 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.6 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.7 Mechanical Ventilation System

a. Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.62.

b. To the extent feasible, use local exhaust ventilation connected to HEPA filters or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.

c. Vent local exhaust outside the building only and away from building ventilation intakes.

d. Use locally exhausted, power actuated, paint removal tools.

3.1.1.8 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead

control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Lead Control Area Requirements

Establish a lead control area by situating critical barriers and physical boundaries around the area or structure where LBP/PWL removal/control operations will be performed.

Full containment - Contain removal operations by the use of critical barriers and HEPA filtered exhaust or a negative pressure enclosure system with decontamination facilities and with HEPA filtered exhaust if required by the CP. For containment areas larger than 1,000 square feet install a minimum of two 18 inch square viewing ports. Locate ports to provide a view of the required work from the exterior of the enclosed contaminated area. Glaze ports with laminated safety glass.

3.3 APPLICATION

3.3.1 Work Procedures

Perform removal of lead-based paint in accordance with approved lead-based paint/paint with lead removal/control plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead-based paint is removed in accordance with 29 CFR 1926.62. Dispose of removed paint chips and associated waste in compliance with Environmental Protection Agency (EPA), State, and local requirements.

3.3.2 Lead-Based Paint Removal/Control/Deleading

Manual or power sanding of interior and exterior surfaces is not permitted unless tools are equipped with HEPA attachments or wet methods. The dry sanding or grinding of surfaces that contain lead is prohibited Provide methodology for LBP removal/control in work plan. Remove paint within the areas designated on the drawings in order to completely expose the substrate. Take whatever precautions necessary to minimize damage to the underlying substrate.

Avoid flash rusting or deterioration of the substrate. Provide surface preparations for painting in accord with Section 09 90 00 PAINTS AND COATINGS.

Provide methodology for LBP/PWL removal or abatement/control and processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris/waste and to ensure that unprotected personnel are not exposed to hazardous concentrations of lead. Describe this LBP/PWL removal/control process in the LBP/PWL R/CP.

3.3.2.1 Indoor Paint Removal

Perform manualmechanicalthermal or chemical paint removal in lead control areas using enclosures, barriers, or containments and powered locally exhausted paint removal tools. Collect residue debris for disposal in accordance with federal, State, and local requirements.

3.3.2.2 Outdoor Paint Removal

Perform outdoor removal as indicated in federal, State, and local regulations and in the LBP/CPR/CP. The worksite preparation (barriers or containments) shall be job dependent and presented in the LBP/PWL R/CP.

3.3.3 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

a. Vacuum themselves off.

b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.

c. Shower or wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing; move to an appropriate facility; shower.

d. Change to clean clothes prior to leaving the physical boundary designated around the lead control area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Air sample for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

a. The CP shall be on the job site directing the air and non-clearance wipe sampling and inspecting the lead-based paint removal/control work to ensure that the requirements of the contract have been satisfied during the entire lead-based paint removal operation.

b. Collect personal air samples on employees who are expected to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least 25 percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

c. Submit results of air samples, within 72 hours after the air samples are taken.

d. Before any work begins, a third party consultant shall collect and analyze baseline wipe and soil samples in accordance with methods defined in federal, State, and local standards inside and outside of the physical boundary to assess the degree of dust contamination in the facility prior to lead-based paint removal/control.

e. Collect surface wipe samples at a location no greater than 10 feet outside the lead control area at a frequency of once per day while lead removal work is conducted. Surface wipe results shall meet criteria in paragraph "Clearance Certification."

3.4.1.2 Air Sampling During Paint Removal Work

Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the lead control area.

3.4.1.3 Sampling After Paint Removal/Control

After the visual inspection, conduct soil sampling if bare soil is present during external removal/control operations and collect wipe samples according to the HUD protocol contained in HUD 6780 to determine the lead content of settled dust and dirt in micrograms per square meter foot of surface area and parts per million (ppm) for soil.

3.4.1.4 Testing of Removed Paint and Used Abrasive

Test removed paint and used abrasive in accordance with 40 CFR 261 for hazardous waste.

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the CP. Reclean areas showing dust or residual paint chips or debris. After visible dust, chips and debris is removed, wet wipe and HEPA vacuum all surfaces in the work area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before restarting work.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the lead control area during paint removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62 and 40 CFR 745; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification.

The third party consultant shall certify surface wipe sample results collected inside and outside the work area are less than 200 micrograms per square foot on floors or horizontal surfaces.

For exterior paint removal/control work, soil samples taken at the exterior of the work site shall be used to determine if soil lead levels had increased at a statistically significant level (significant at the 95 percent confidence limit) from the soil lead levels prior to the work. If soil lead levels do show a statistically significant increase or is above any applicable Federal or State standard for lead in soil, the soil shall be remediated back to the pre-work level.

Clear the lead control area in industrial facilities of all visible dust and debris.

For lead-based paint hazard abatement work, surface wipe and soil sampling shall be conducted and clearance determinations made according to the work practice standards presented in 40 CFR 745.227.

3.5.2 Disposal

a. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 262. Dispose of lead-contaminated waste material at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.

b. Place waste materials in U.S. Department of Transportation (49 CFR 178) approved 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. For hazardous waste, the collection drum requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.

c. Handle, transport, and dispose lead or lead-contaminated material classified as hazardous waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

d. All material, whether hazardous or non-hazardous shall be disposed in accordance with laws and provisions and Federal, State, or local regulations. Ensure waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

3.5.2.1 Disposal Documentation

Submit written evidence to demonstrate the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA, State or local regulatory agencies. Submit one copy of the completed hazardous waste manifest, signed and dated by the initial transporter in accordance with 40 CFR 262. Contractor shall provide a certificate that the waste was accepted by the disposal facility. Provide turn-in documents or weight tickets for non-hazardous waste disposal.

3.5.3 Payment for Hazardous Waste

Payment for disposal of hazardous and non-hazardous waste will not be made

until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials or non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 02 83 13.00 20

LEAD IN CONSTRUCTION
08/11

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780	(1995; Errata Aug 1996;Rev Ch. 7 - 1997) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

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

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.33	Access to Employee Exposure and Medical Records
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and

	Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period.

1.2.2 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel (approximately 5 to 6 feet above the floor).

1.2.3 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations and has the authority to take prompt corrective actions to control the lead hazard. A Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.4 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment (PPE).

1.2.5 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.6 High Efficiency Particulate Arrestor (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of

collecting and retaining lead-contaminated particulate. A high efficiency particulate filter demonstrates at least 99.97 percent efficiency against 0.3 micron or larger size particles.

1.2.7 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.

1.2.8 Lead Control Area

A system of control methods to prevent the spread of lead dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.9 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a work day, the PEL shall be determined by the following formula:

PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

1.2.10 Material Containing Lead/Paint with Lead (MCL/PWL)

Any material, including paint, which contains lead as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of lead are found using a quantitative method for analyzing paint or MCL using laboratory instruments with specified limits of detection (usually 0.01 percent). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.11 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.12 Physical Boundary

Area physically roped or partitioned off around lead control area to limit unauthorized entry of personnel.

1.3 DESCRIPTION

1.3.1 Description of Work

Construction activities impacting PWL or material containing lead which are covered by this specification include the demolition and/or removal of material containing lead as indicated in each task order.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead activities.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Occupational and Environmental Assessment Data Report (if objective data is used to justify excluding the initial occupational exposure assessment); G

Lead Compliance Plan including CP approval (signature, date, and certification number); G

Competent Person qualifications; G

Training Certification of workers and supervisors; G

lead waste management plan; G

written evidence that TSD is approved for lead disposal; G

Certification of Medical Examinations; G

SD-06 Test Reports

sampling results; G

Occupational and Environmental Assessment Data Report; G

SD-07 Certificates

Testing laboratory qualifications; G

Occupant Notification; G

Third party consultant qualifications; G

Clearance Certification; G

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility; G

Waste turn-in documents or weight tickets for non-hazardous wastes that are disposed of at sanitary or construction and demolition landfills; G

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Competent Person (CP)

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide documented construction project-related experience with implementation of OSHA's Lead in Construction standard (29 CFR 1926.62) which shows ability to assess occupational and environmental exposure to lead, experience with the use of respirators, personal protective equipment and other exposure reduction methods to protect employee health. Submit proper documentation that the CP is trained and licensed in accordance with federal, State and local laws. The competent person shall be a licensed lead-based paint abatement Supervisor/Project Designer in the State of Hawaii.

1.5.1.2 Training Certification

Submit a certificate for each worker and supervisor, signed and dated by the accredited training provider, stating that the employee has received the required lead training specified in 29 CFR 1926.62(l)and is certified to perform or supervise deleading, lead removal or demolition activities in the state of Hawaii.

1.5.1.3 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the air and wipe analysis, testing, and reporting of airborne concentrations of lead. Use a laboratory participating in the EPA National Lead Laboratory Accreditation Program (NLLAP) by being accredited by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.1.4 Third Party Consultant Qualifications

Submit the name, address and telephone number of the third party consultant selected to perform the wipe sampling for determining concentrations of lead in dust. Submit proper documentation that the consultant is trained and certified as an inspector technician or inspector/risk assessor by the USEPA authorized State (or local) certification and accreditation program.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

a. Verify training meets all federal, State, and local requirements.

b. Review and approve Lead Compliance Plan for conformance to the applicable referenced standards.

c. Continuously inspect PWL or MCL work for conformance with the approved plan.

d. Perform (or oversee performance of) air sampling. Recommend upgrades or downgrades (whichever is appropriate based on exposure) on the use of PPE (respirators included) and engineering controls.

e. Ensure work is performed in strict accordance with specifications at all times.

f. Control work to prevent hazardous exposure to human beings and to the environment at all times.

g. Supervise final cleaning of the lead control area, take clearance wipe samples if necessary; review clearance sample results and make recommendations for further cleaning.

h. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead Compliance Plan

Submit a detailed job-specific plan of the work procedures to be used in the disturbance of PWL or MCL. The plan shall include a sketch showing the location, size, and details of lead control areas, critical barriers, physical boundaries, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include a description of equipment and materials, work practices, controls and job responsibilities for each activity from which lead is emitted. Include in the plan, eating, drinking, smoking, hygiene facilities and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and dust containing lead and debris, air sampling, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that lead is not released outside of the lead control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training and strategy, sampling and analysis strategy and methodology, frequency of sampling, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multicontractor worksites to inform affected employees and to clarify responsibilities to control exposures.

The plan shall be developed by a certified planner/project designer in the State of Hawaii.

In occupied buildings, the plan shall also include an occupant protection program that describes the measures that will be taken during the work to notify and protect the building occupants.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

In order to reduce the full implementation of 29 CFR 1926.62, the Contractor shall provide documentation. Submit a report that supports the determination to reduce full implementation of the requirements of 29 CFR 1926.62 and supporting the Lead Compliance Plan.

a. The initial monitoring shall represent each job classification, or if

working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of 29 CFR 1926.62 with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, rivet busting, cleanup of dry expendable abrasives, abrasive blast enclosure removal, abrasive blasting, welding, cutting and torch burning where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the lead compliance plan per 29 CFR 1926.62.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62 and 29 CFR 1926.103. Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62. Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.

1.5.2.5 Training

Train each employee performing work that disturbs lead, who performs MCL/PWL disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. Establish and implement a respiratory protection program as required by AIHA Z88.6, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Lead Waste Management

The Lead Waste Management Plan shall comply with applicable requirements of federal, State, and local hazardous waste regulations. and address:

a. Identification and classification of wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and operator and a 24-hour point of contact. Furnish two copies of USEPA and local hazardous waste permit applications permits manifests and USEPA Identification numbers.

d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.

g. Work plan and schedule for waste containment, removal and disposal. Proper containment of the waste includes using acceptable waste containers (e.g., 55-gallon drums) as well as proper marking/labeling of the containers. Wastes shall be cleaned up and containerized daily.

h. Include any process that may alter or treat waste rendering a hazardous waste non hazardous.

i. Unit cost for hazardous waste disposal according to this plan.

1.5.2.9 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, State, and local authorities regarding lead. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply. The following State laws, ordinances, criteria, rules and regulations regarding removing, handling, storing, transporting, and disposing of lead-contaminated materials.

Licensing and certification in the state of Hawaii is required.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the Lead Waste Management Plan and the Lead Compliance Plan, including procedures and precautions for the work.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust, fume and mist. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable or uncontaminated, reusable protective whole body clothing, head covering, gloves, eye, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during PWL or MCL handling and disposal, notify the rental agency in writing concerning the intended use of the equipment.

1.6.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the lead removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, eye, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.

1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better as determined by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer 20 days prior to the start of any lead work.

b. Occupant Notification

Submit occupant written acknowledgment of the delivery of lead hazard information pamphlet (EPA 747-K-99-001 "Protect Your Family From Lead in Your Home") prior to commencing the renovation work for each affected unit using language provided in 40 CFR 745 Subpart E.

3.1.1.2 Lead Control Area

a. Physical Boundary - Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside of the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Furnishings

Furniture and equipment will remain in the lead control area. Protect and cover furnishings or remove furnishings from the work area and store in a location approved by the Contracting Officer.

3.1.1.4 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

3.1.1.5 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.6 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.7 Mechanical Ventilation System

a. To the extent feasible, use local exhaust ventilation or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.

b. Vent local exhaust outside the building and away from building ventilation intakes or ensure system is connected to HEPA filters.

c. Use locally exhausted, power actuated tools or manual hand tools.

3.1.1.8 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Lead Control Area Requirements

Establish a lead control area by completely establishing barriers and physical boundaries around the area or structure where PWL or MCL removal operations will be performed.

Full containment - Contain removal operations by the use of critical barriers and HEPA filtered exhaust or a negative pressure enclosure system with decontamination facilities and with HEPA filtered exhaust if required by the CP. For containment areas larger than 1,000 square feet install a minimum of two 18 inch square viewing ports. Locate ports to provide a view of the required work from the exterior of the enclosed contaminated area. Glaze ports with laminated safety glass.

3.3 APPLICATION

3.3.1 Lead Work

Perform lead work in accordance with approved Lead Compliance Plan. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when the work is performed in accordance with 29 CFR 1926.62 or 40 CFR 745, and as specified herein. Dispose of all PWL or MCL and associated waste in compliance with federal, State, and local requirements.

3.3.2 Paint with Lead or Material Containing Lead Removal

Manual or power sanding or grinding of lead surfaces or materials is not permitted unless tools are equipped with HEPA attachments or wet methods. The dry sanding or grinding of surfaces that contain lead is prohibited. Provide methodology for removing lead in the Lead Compliance Plan. Select lead removal processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris or waste and to ensure that unprotected personnel are not exposed to hazardous concentrations of lead. Describe this removal process in the Lead Compliance Plan.

3.3.2.1 Paint with Lead or Material Containing Lead - Indoor Removal

Perform manual or mechanical removal and thermal cutting in the lead control areas using enclosures, barriers or containments and powered locally exhausted tools. Collect residue debris for disposal in accordance with federal, State, and local requirements.

3.3.2.2 Paint with Lead or Material Containing Lead - Outdoor Removal

Perform outdoor removal as indicated in federal, State, and local regulations and in the Lead Compliance Plan. The worksite preparation (barriers or containments) shall be job dependent and presented in the Lead Compliance Plan.

3.3.3 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn in the control area:

a. Vacuum all clothing before entering the contaminated change room.

b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.

c. Shower or wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing, move to an appropriate shower facility, shower.

d. Change to clean clothes prior to leaving the clean clothes storage area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Conduct sampling for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

a. The CP shall be on the job site directing the air and wipe sampling and inspecting the PWL or MCL removal work to ensure that the requirements of the contract have been satisfied during the entire PWL or MCL operation.

b. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least twenty-five percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

c. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken.

d. Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval.

e. Before any work begins, a third party consultant shall collect and analyze baseline wipe and soil samples in accordance with methods defined by federal, State, and local standards inside and outside of the physical boundary to assess the degree of dust contamination in the facility prior to lead disturbance or removal.

f. Surface Wipe Samples - Collect surface wipe samples on floors at a location no greater than 10 feet outside the lead control area at a frequency of once per day while lead removal work is conducted in occupied buildings. Surface wipe results shall meet criteria in paragraph "Clearance Certification.

3.4.1.2 Sampling After Removal

After the visual inspection, conduct soil sampling if bare soil is present during external removal operations and collect wipe and soil samples according to the HUD protocol contained in HUD 6780 to determine the lead content of settled dust in micrograms per square meter foot of surface area and parts per million (ppm) for soil.

3.4.1.3 Testing of Material Containing Lead Residue

Test residue in accordance with 40 CFR 261 for hazardous waste.

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of dust and debris. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use pressurized air to clean up the area. At the end of each shift and when the lead operation has been completed, clean the controlled area of visible contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the Lead Compliance Plan. Reclean areas showing dust or debris. After visible dust and debris is removed, wet wipe and HEPA vacuum all surfaces in the controlled area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before clearance testing.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the lead control area during paint removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification.

The third party consultant shall certify surface wipe sample results collected inside and outside the work area are less than 200 micrograms per square foot on floors or horizontal surfaces.

Clear the lead control area in industrial facilities of all visible dust and debris.

For exterior work, soil samples taken at the exterior of the work site shall be used to determine if soil lead levels had increased at a statistically significant level (significant at the 95 percent confidence limit) from the soil lead levels prior to the operation. If soil lead levels either show a statistically significant increase above soil lead levels prior to work or soil lead levels above any applicable federal or state standard for lead in soil, the soil shall be remediated.

3.5.2 Disposal

a. All material, whether hazardous or non-hazardous shall be disposed in

accordance with all laws and provisions and all federal, State or local regulations. Ensure all waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

b. Contractor is responsible for segregation of waste. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261.

c. Dispose of lead-contaminated material classified as hazardous waste at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.

d. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. For hazardous waste, the collection drum requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.

e. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

3.5.2.1 Disposal Documentation

Submit written evidence to demonstrate the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA, State or local regulatory agencies. Submit one copy of the completed hazardous waste manifest, signed and dated by the initial transporter in accordance with 40 CFR 262. Contractor shall provide a certificate that the waste was accepted by the disposal facility. Provide turn-in documents or weight tickets for non-hazardous waste disposal.

3.5.2.2 Payment for Hazardous Waste

Payment for disposal of hazardous and non-hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials or non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 02 84 16

HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY
04/06

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.

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

29 CFR 1910.1000	Air Contaminants
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 273	Standards For Universal Waste Management
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 178	Specifications for Packagings

1.2 REQUIREMENTS

Removal and disposal of PCB containing lighting ballasts and associated mercury-containing lamps. Contractor may encounter leaking PCB ballasts.

1.3 DEFINITIONS

1.3.1 Certified Industrial Hygienist (CIH)

A industrial hygienist hired by the contractor shall be certified by the American Board of Industrial Hygiene.

1.3.2 Leak

Leak or leaking means any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

1.3.3 Lamps

Lamp, also referred to as "universal waste lamp", is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

1.3.4 Polychlorinated Biphenyls (PCBs)

PCBs as used in this specification shall mean the same as PCBs, PCB containing lighting ballast, and PCB container, as defined in 40 CFR 761, Section 3, Definitions.

1.3.5 Spill

Spill means both intentional and unintentional spills, leaks, and other uncontrolled discharges when the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases.

1.3.6 Universal Waste

Universal Waste means any of the following hazardous wastes that are managed under the universal waste requirements 40 CFR 273:

(1) Batteries as described in Sec. 273.2 of this chapter;
(2) Pesticides as described in Sec. 273.3 of this chapter;
(3) Thermostats as described in Sec. 273.4 of this chapter; and
(4) Lamps as described in Sec. 273.5 of this chapter.

1.4 QUALITY ASSURANCE

1.4.1 Regulatory Requirements

Perform PCB related work in accordance with 40 CFR 761 and . Perform mercury-containing lamps storage and transport in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, and 40 CFR 273.

1.4.2 Training

Certified industrial hygienist (CIH) shall instruct and certify the training of all persons involved in the removal of PCB containing lighting ballasts and mercury-containing lamps. The instruction shall include: The dangers of PCB and mercury exposure, decontamination, safe work practices,

and applicable OSHA and EPA regulations. The CIH shall review and approve the PCB and Mercury-Containing Lamp Removal Work Plans.

1.4.3 Regulation Documents

Maintain at all times one copy each at the office and one copy each in view at the job site of 29 CFR 1910.1000, 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 265, 40 CFR 268, 40 CFR 270, 40 CFR 273, 40 CFR 761 and of the Contractor removal work plan and disposal plan for PCB and for associated mercury-containing lamps.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Qualifications of CIH; G

Training Certification; G

PCB and Lamp Removal Work Plan; G

PCB and Lamp Disposal Plan; G

SD-11 Closeout Submittals

Transporter certification of notification to EPA of their PCB waste activities and EPA ID numbers; G

Certification of Decontamination

Certificate of Disposal and/or recycling. Submit to the Government before application for payment within 30 days of the date that the disposal of the PCB and mercury-containing lamp waste identified on the manifest was completed.

DD Form 1348-1

Testing results

1.6 ENVIRONMENTAL REQUIREMENTS

Use special clothing:

a. Disposable gloves (polyethylene)

b. Eye protection

c. PPE as required by CIH

1.7 SCHEDULING

Notify the Contracting Officer 20 days prior to the start of PCB and mercury-containing lamp removal work.

1.8 QUALITY ASSURANCE

1.8.1 Qualifications of CIH

Submit the name, address, and telephone number of the Industrial Hygienist selected to perform the duties in paragraph entitled "Certified Industrial Hygienist." Submit training certification that the Industrial Hygienist is certified, including certification number and date of certification or re certification.

1.8.2 PCB and Lamp Removal Work Plan

Submit a job-specific plan within 20 calendar days after award of contract of the work procedures to be used in the removal, packaging, and storage of PCB-containing lighting ballasts and associated mercury-containing lamps. Include in the plan: Requirements for Personal Protective Equipment (PPE), spill cleanup procedures and equipment, eating, smoking and restroom procedures. The plan shall be approved and signed by the Certified Industrial Hygienist. Obtain approval of the plan by the Contracting Officer prior to the start of PCB and/or lamp removal work.

1.8.3 PCB and Lamp Disposal Plan

Submit a PCB and lamp Disposal Plan with 45 calendar days after award of contract. The PCB and Lamp Disposal Plan shall comply with applicable requirements of federal, state, and local PCB and Universal waste regulations and address:

a. Estimated quantities of wastes to be generated, disposed of, and recycled.

b. Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location. Furnish two copies of EPA and state PCB and mercury-containing lamp waste permit applications and EPA identification numbers, as required.

c. Names and qualifications (experience and training) of personnel who will be working on-site with PCB and mercury-containing lamp wastes.

d. Spill prevention, containment, and cleanup contingency measures to be implemented.

e. Work plan and schedule for PCB and mercury-containing lamp waste removal, containment, storage, transportation, disposal and or recycling. Wastes shall be cleaned up and containerize daily.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 WORK PROCEDURE

Furnish labor, materials, services, and equipment necessary for the removal of PCB containing lighting ballasts, associated mercury-containing fluorescent lamps, and high intensity discharge (HID) lampsin accordance with local, state, or federal regulations. Do not expose PCBs to open

flames or other high temperature sources since toxic decomposition by-products may be produced. Do not break mercury containing fluorescent lamps or high intensity discharge lamps.

3.1.1 Work Operations

Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with 40 CFR 761, 40 CFR 262 40 CFR 263, and the applicable requirements of this section, including but not limited to:

a. Obtaining suitable PCB and mercury-containing lamp storage sites.

b. Notifying Contracting Officer prior to commencing the operation.

c. Reporting leaks and spills to the Contracting Officer.

d. Cleaning up spills.

e. Inspecting PCB and PCB-contaminated items and waste containers for leaks and forwarding copies of inspection reports to the Contracting Officer.

f. Maintaining inspection, inventory and spill records.

3.2 PCB SPILL CLEANUP REQUIREMENTS

3.2.1 PCB Spills

Immediately report to the Contracting Officer any PCB spills.

3.2.2 PCB Spill Control Area

Rope off an area around the edges of a PCB leak or spill and post a "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to a drip pan or other container.

3.2.3 PCB Spill Cleanup

40 CFR 761, subpart G. Initiate cleanup of spills as soon as possible, but no later than 24 hours of its discovery. Mop up the liquid with rags or other conventional absorbent. The spent absorbent shall be properly contained and disposed of as solid PCB waste.

3.2.4 Records and Certification

Document the cleanup with records of decontamination in accordance with 40 CFR 761, Section 125, Requirements for PCB Spill Cleanup. Provide test results of cleanup and certification of decontamination.

3.3 REMOVAL

3.3.1 Ballasts

As ballast are removed from the lighting fixture, inspect label on ballast. Ballasts without a "No PCB" label shall be assumed to contain PCBs and containerized and disposed of as required under paragraphs STORAGE FOR DISPOSAL and DISPOSAL. If there are less than 1600 "No PCB" labeled lighting ballasts dispose of them as normal demolition debris. If there

are more than 1600 "No PCB" labeled ballasts, establish whether the "No PCB" labeled ballasts contain diethylhexyl phthalate (DEHP) either by test or by checking with the ballast manufacturer indicated on the label. Submit testing results and/or written confirmation from the manufacturer to the Contracting Officer. If the ballasts do not contain DEHP, dispose of them as normal construction debris. If they do contain DEHP, dispose of them as hazardous material in accordance with Federal, State, and local regulations. As a basis of bid assume ballasts with "No PCB" labels do not contain DEHP and may disposed of as normal construction debris. If 1600 or more DEHP ballasts are disposed of in a 24 hour period, notify the National Response Team at 800-424-8802.

3.3.2 Lighting Lamps

Remove lighting tubes/lamps from the lighting fixture and carefully place (unbroken) into appropriate containers (original transport boxes or equivalent). In the event of a lighting tube/lamp breaking, sweep and place waste in double plastic taped bags and dispose of as universal waste as specified herein.

3.4 STORAGE FOR DISPOSAL

3.4.1 Storage Containers for PCBs

49 CFR 178. Store PCB in containers approved by DOT for PCB.

3.4.2 Storage Containers for lamps

Store mercury containing lamps in appropriate DOT containers. The boxes shall be stored and labeled for transport in accordance with 40 CFR 273.

3.4.3 Labeling of Waste Containers

Label with the following:

a. Date the item was placed in storage and the name of the cognizant activity/building.

b. "Caution Contains PCB," conforming to 40 CFR 761, CFR Subpart C. Affix labels to PCB waste containers.

c. Label mercury-containing lamp waste in accordance with 40 CFR 273. Affix labels to all lighting waste containers.

3.5 DISPOSAL

Dispose of off Government property in accordance with EPA, DOT, and local regulations at a permitted site.

3.5.1 Identification Number

Federal regulations 40 CFR 761, and 40 CFR 263 require that generators, transporters, commercial storers, and disposers of PCB waste posses U.S. EPA identification numbers. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Uniform Hazardous Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work. For mercury containing lamp removal, Federal regulations 40 CFR 273 require that large quantity handlers of Universal waste (LQHUW)

must provide notification of universal waste management to the appropriate EPA Region (or state director in authorized states), obtain an EPA identification number, and retain for three years records of off-site shipments of universal waste. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Universal Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work.

3.5.2 Transporter Certification

Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Government. Return a signed copy to the Government before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities (EPA Form 7710-53).

3.5.2.1 Certificate of Disposal and/or Recycling

40 CFR 761. Certificate for the PCBs and PCB items disposed shall include:

a. The identity of the disposal and or recycling facility, by name, address, and EPA identification number.

b. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

c. A statement certifying the fact of disposal and or recycling of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

d. A certification as defined in 40 CFR 761.

3.5.3 Disposal by the Government

Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Load and haul PCBs to the storage site operated by the Defense Reutilization and marketing Officer (DRMO). If the primary site is filled to capacity, contact the Contracting Officer. The transport distance to any storage site will not exceed the distance between the project site and the DRMO storage site on base.

3.5.3.1 Delivery

Contact DRMO at least 5 working days in advance to make arrangements for delivery of PCB to the storage site.

3.5.3.2 DD Form 1348-1

Prepare DD Form 1348-1 Turn-in Document (TID), which will accompany the PCB to the storage site. Ensure that a responsible person from the activity that owns the PCB signs the DD Form 1348-1.

-- End of Section --

SECTION 02 84 33

REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs)
04/06

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.

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

29 CFR 1910.1000	Air Contaminants
29 CFR 1910.145	Accident Prevention Signs and Tags
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 174	Carriage by Rail
49 CFR 175	Carriage by Aircraft
49 CFR 176	Carriage by Vessel
49 CFR 177	Carriage by Public Highway
49 CFR 178	Specifications for Packagings
49 CFR 179	Specifications for Tank Cars

1.2 REQUIREMENTS

The work includes the removal and disposal of PCB's. Perform work in accordance with 40 CFR 761 and the requirements specified herein.

1.3 DEFINITIONS

1.3.1 Leak

Leak or leaking means any instance in which a PCB Article, PCB Container, or PCB Equipment has any PCBs on any portion of its external surface.

1.3.2 PCBs

PCBs as used in this specification shall mean the same as PCBs, PCB Article, PCB Article Container, PCB Container, PCB Equipment, PCB Item, PCB Transformer, PCB-Contaminated Electrical Equipment, as defined in 40 CFR 761, Section 3, Definitions.

1.3.3 Spill

Spill means both intentional and unintentional spills, leaks, and other uncontrolled discharges when the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases.

1.4 QUALITY ASSURANCE

1.4.1 Training

Instruct employees on the dangers of PCB exposure, on respirator use, decontamination, and applicable OSHA and EPA regulations.

1.4.2 Certified Industrial Hygienist (CIH)

Obtain the services of an industrial hygienist certified by the American Board of Industrial Hygiene to certify training, review and approve the PCB removal plan, including determination of the need for personnel protective equipment (PPE) in performing PCB removal work.

1.4.3 Regulation Documents

Maintain at all times one copy each at the office and one copy each in view at the job site 29 CFR 1910.1000, 40 CFR 761, and Contractor work practices for removal, storage and disposal of PCBs.

1.4.4 Surveillance Personnel

Surveillance personnel may enter PCB control areas for brief periods of time provided they wear disposable polyethylene gloves and disposal polyethylene foot covers, as a minimum. Additional protective equipment may be required if respiratory hazard is involved or if skin contact with PCB is involved.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Training certification

Qualifications of CIH

PCB removal work plan

PCB disposal plan

Notification

Transporter certification of notification to EPA of their PCB waste activities and EPA ID numbers

Certification of Decontamination for PCB Spill

Post cleanup sampling data

Certificate of disposal

1.6 EQUIPMENT

1.6.1 Special Clothing

Work clothes shall consist of PPE as required by OSHA regulations, including, but not limited to the following:

a. Disposable coveralls

b. Gloves (Disposable rubber gloves may be worn under these)

c. Disposable foot covers (polyethylene)

d. Chemical safety goggles

e. Half mask cartridge respirator.

1.6.2 Special Clothing for Government Personnel

Provide PPE specified in paragraph entitled "Special Clothing" to the Contracting Officer as required for inspection of the work.

1.6.3 PCB Spill Kit

Assemble a spill kit to include the following items:

ITEM	MINIMUM QUANTITY
1. Disposable gloves (polyethylene)	6 prs
2. Gloves with a high degree of impermeability to PCB	6 prs
3. Disposable coveralls with permeation resistance to PCB	4 ea
4. Chemical safety goggles	2 ea
5. Disposable foot covers (polyethylene)	6 prs
6. PCB Caution Sign: "PCB Spill--Authorized Personnel Only"	2 ea

7. Banner guard or equivalent banner material	100 feet
8. Absorbent material	
9. Blue polyethylene waste bags	5 bags
10. Cloth backed tape	5 ea
11. Area access logs, blank	1 roll
12. Brattice cloth, 6' x 6'	10 ea
13. Rags	1 piece
14. Ball point pens	20 ea
15. Herculite, 4' x 4' and 8' x 8'	2 ea and 1 ea
16. Blank metal signs and grease pencils	
17. Waste containers 55 gallon drum, may be used as container for kit	2 ea ea

1.7 QUALITY ASSURANCE

1.7.1 Training Certification

Submit certificates, prior to the start of work but after the main abatement submittals, signed and dated by the CIH and by each employee stating that the employee has received training. Certificates shall be organized by individual worker, not grouped by type of certificates.

1.7.2 Qualifications of CIH

Submit the name, address, and telephone number of the Industrial Hygienist selected to perform the duties in paragraph entitled "Certified Industrial Hygienist." Submit proper documentation that the Industrial Hygienist is certified, including certification number and date of certification/recertification.

1.7.3 PCB Removal Work Plan

Submit a detailed job-specific plan of the work procedures to be used in the removal of PCB-containing materials, not to be combined with other hazardous abatement plans. Provide a Table of Contents for each abatement submittal which shall follow the sequence of requirements in the contract. The plan shall include a sketch showing the location, size, and details of PCB control areas, location and details of decontamination rooms, change rooms, shower facilities, and mechanical ventilation system. Include in the plan, eating, drinking, smoking and restroom procedures, interface of trades, sequencing of PCB related work, PCB disposal plan, respirators, protective equipment, and a detailed description of the method of containment of the operation to ensure that PCB contamination is not spread or carried outside of the control area. Include provisions to ensure that airborne PCB concentrations of 3.10 E-08 pound per cubic feet of air are not exceeded outside of the PCB control area. Include air sampling,

training and strategy, sampling methodology, frequency, duration of sampling, and qualifications of air monitoring personnel in the air sampling portion of the plan. Obtain approval of the plan prior to the start of PCB removal work.

1.7.4 PCB Disposal Plan

Submit a PCB Disposal Plan within 45 calendar days after award of contract for Contracting Officer's approval. The PCB Disposal Plan shall comply with applicable requirements of Federal, State, and local PCB waste regulations and address:

a. Identification of PCB wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of EPA State and local PCB waste permit applications, permits and EPA Identification numbers.

d. Names and qualifications (experience and training) of personnel who will be working on-site with PCB wastes.

e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures to be implemented.

g. Work plan and schedule for PCB waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily.

1.7.5 Notification

Notify the Contracting Officer 20 days prior to the start of PCB removal work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Decontamination Room, Clean Room and Shower Facilities

a. Provide material and labor for construction of a decontamination room, a clean room, and shower facilities. Provide rooms with doors and attach to the exit ways of PCB work areas. Rooms shall be of sufficient size to accommodate the Contractor's operation within. Provide portable toilet and shower facilities. Locate shower facilities between the clean room and decontamination room. Provide separate clothing lockers or containers in each room to prevent contamination of street and work clothes.

b. Remove PCB-contaminated PPE in the decontamination room. Workers shall

then proceed to showers. Workers shall shower before lunch and at the end of each day's work. Hot water, towels, soap, and hygienic conditions are the responsibility of the Contractor.

3.1.2 PCB Control Area

Isolate PCB control area by physical boundaries to prevent unauthorized entry of personnel. Food, drink and smoking materials shall not be permitted in areas where PCBs are handled or PCB items are stored.

3.1.3 Personnel Protection

Workers shall wear and use PPE, as recommended by the Industrial Hygienist, upon entering a PCB control area. If PPE is not required per the CIH, specify in the PCB removal work plan.

3.1.4 Footwear

Work footwear shall remain inside work area until completion of the job.

3.1.5 Permissible Exposure Limits (PEL)

PEL for PCBs is 3.1 E-08 lb/cubic foot on an 8-hour time weighted average basis.

3.1.6 Special Hazards

a. PCBs shall not be exposed to open flames or other high temperature sources since toxic decomposition by-products may be produced.

b. PCBs shall not be heated to temperatures of 135 degrees F or higher without Contracting Officer's concurrence.

3.1.7 PCB Caution Label

40 CFR 761, Subpart C. Affix labels to PCB waste containers and other PCB-contaminated items. Provide label with sufficient print size to be clearly legible, with bold print on a contrasting background, displaying the following: CAUTION: Contains PCBs (Polychlorinated Biphenyls).

3.1.8 PCB Caution Sign

29 CFR 1910.145. Provide signs at approaches to PCB control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area.

3.2 WORK PROCEDURE

Furnish labor, materials, services, and equipment necessary for the complete removal of PCBs located at the site as indicated or specified in accordance with local, State, or Federal regulations. Package and mark PCB as required by EPA and DOT regulations and dispose of off Government property in accordance with EPA, DOT, and local regulations at a permitted site.

3.2.1 No Smoking

Smoking is not permitted within 50 feet of the PCB control area. Provide "No Smoking" signs as directed by the Contracting Officer.

3.2.2 Work Operations

Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with 40 CFR 761 and the applicable requirements of this section, including but not limited to:

a. Obtaining advance approval of PCB storage sites.

b. Notifying Contracting Officer prior to commencing the operation.

c. Reporting leaks and spills to the Contracting Officer.

d. Cleaning up spills.

e. Maintaining an access log of employees working in a PCB control area and providing a copy to the Contracting Officer upon completion of the operation.

f. Inspecting PCB and PCB-contaminated items and waste containers for leaks and forwarding copies of inspection reports to the Contracting Officer.

g. Maintaining a spill kit as specified in paragraph entitled "PCB Spill Kit."

h. Maintaining inspection, inventory and spill records.

3.3 PCB TRANSFORMERS

3.3.1 Draining of Transformer Liquid

Perform work in accordance with 49 CFR 171, 49 CFR 172, 49 CFR 173, 49 CFR 174, 49 CFR 175, 49 CFR 176, 49 CFR 177, 49 CFR 178, and 49 CFR 179, Subchapter C and as specified herein. Drain the transformer, switches, and regulators of free flowing liquid prior to transportation. Place the drained liquids in DOT Spec 17E drums. The drums shall not contain more than 50 gallons of oil. If the equipment cannot be drained, then place it in DOT Spec 17C drums.

3.3.2 Markings

Provide drums and drained PCB-contaminated electrical equipment with caution label markings as specified in paragraph entitled "PCB Caution Label."

3.3.3 Laboratory Analysis

All transformers shall have a laboratory analysis for turn-in. DRMO-Hawaii prefers a gas chromotograph test. The only two exceptions to this rule are:

a. The transformer is hermetically sealed (solder sealed or fusion sealed. No access ports or openings).

b. The name plate states that the transformer contains pyranol, interteen, etc.

Attach a copy of the lab analysis to both the DD 1348-1 and the transformer itself.

3.3.4 Markings

3.3.4.1 Transformers, Less Than 50 ppm

Add absorbent material to absorb residue oil remaining after draining. Write the date drained on the transformer. Turn in transformers to the DRMO Scrapyard. Telephone 471-3636 to schedule appointment for turn-in.

3.3.4.2 Transformers, 50-499 ppm

Same procedure as transformers in the less than 50 ppm range.

3.3.4.3 Transformers, Greater Than 500 ppm

Stencil date drained on the transformer. Turn in transformer to DRMO-Hawaii, Building #26, Manana Storage Area.

3.3.4.4 Drums

Stencil on DOT-approved 55 gallon drums containing PCB liquid the following:

a. ppm

b. Date drum filled

c. Serial number of transformer liquid came from

d. National Stock Number

(1) "9999-00-OIL" for <50 ppm

(2) "9999-00-CONPCB" for 50-499 ppm

(3) "9999-00-PCBOIL" for >500 ppm

Do not mix different ppms in the same drum. Drums must have a 2 inch ullage space from the top of the drum.

3.4 PCB REMOVAL

Select PCB removal procedure to minimize contamination of work areas with PCB or other PCB-contaminated debris/waste. Handle PCBs such that no skin contact occurs. PCB removal process should be described in the work plan.

3.4.1 Confined Spaces

As feasible, do not carry out PCB handling operations in confined spaces. A confined space shall mean a space having limited means of egress and inadequate cross ventilation.

3.4.2 Control Area

Establish a PCB control area around the PCB item as specified in paragraph entitled "PCB Control Area." Only personnel briefed on the elements in the paragraph entitled "Training" and on the handling precautions shall be allowed into the area.

3.4.3 Exhaust Ventilation

If used, exhaust ventilation for PCB operations shall discharge to the outside and away from personnel.

3.4.4 Temperatures

As feasible, handle PCBs at ambient temperatures and not at elevated temperatures.

3.4.5 Solvent Cleaning

Clean contaminated tools, containers, etc., after use by rinsing three times with an appropriate solvent or by wiping down three times with a solvent wetted rag. Suggested solvents are stoddard solvent or hexane.

3.4.6 Drip Pans

Drip pans are required under portable PCB transformers and rectifiers in use or stored for use. The pans shall have a containment volume of at least one and one-half times the internal volume of PCBs in the item.

3.4.7 Evacuation Procedures

Procedures shall be written for evacuation of injured workers. Aid for a seriously injured worker shall not be delayed for reasons of decontamination.

3.5 PCB SPILL CLEANUP REQUIREMENTS

3.5.1 PCB Spills

Immediately report to the Contracting Officer any PCB spills on the ground or in the water, PCB spills in drip pans, or PCB leaks.

3.5.2 PCB Spill Control Area

Rope off an area around the edges of a PCB leak or spill and post a "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to a drip pan or other container.

3.5.3 PCB Spill Cleanup

40 CFR 761, Subpart G. Initiate cleanup of spills as soon as possible, but no later than 48 hours of its discovery. To clean up spills, personnel shall wear the PPE prescribed in paragraph entitled "Special Clothing" of this section. If misting, elevated temperatures or open flames are present, or if the spill is situated in a confined space, notify the Contracting Officer. Mop up the liquid with rags or other conventional absorbent. The spent absorbent shall be properly contained and disposed of as solid PCB waste.

3.5.4 Records and Certification

Document the cleanup with records of decontamination in accordance with 40 CFR 761, Section 125, Requirements for PCB Spill Cleanup. Provide certification of decontamination.

3.5.5 Sampling Requirements

Perform post cleanup sampling as required by 40 CFR 761, Section 130, Sampling Requirements. Do not remove boundaries of the PCB control area until site is determined satisfactorily clean by the Contracting Officer.

3.6 STORAGE FOR DISPOSAL

3.6.1 Storage Containers for PCBs

49 CFR 178. Store liquid PCBs in Department of Transportation (DOT) Specification 17E containers. Store nonliquid PCB mixtures, articles, or equipment in DOT Specification 5, 5B, or 17C containers with removable heads.

3.6.2 Waste Containers

Label with the following:

a. "Solid (or Liquid) Waste Polychlorinated Biphenyls"

b. The PCB Caution Label, paragraph entitled "PCB Caution Label"

c. The date the item was placed in storage and the name of the cognizant activity/building.

3.6.3 PCB Articles and PCB-Contaminated Items

Label with items b. through c. above.

3.6.4 Approval of Storage Site

Obtain in advance Contracting Officer approval using the following criteria without exception.

a. Adequate roof and walls to prevent rainwater from reaching the stored PCBs.

b. An adequate floor which has continuous curbing with a minimum 6 inch high curb. Such floor and curbing shall provide a containment volume equal to at least two times the internal volume of the largest PCB article or PCB container stored therein or 25 percent of the total internal volume of all PCB equipment or containers stored therein, whichever is greater.

c. No drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area.

d. Floors and curbing constructed of continuous smooth and impervious materials such as portland cement, concrete or steel to prevent or minimize penetrations of PCBs.

e. Not located at a site which is below the 100-year flood water elevation.

f. Each storage site shall be posted with the PCB Caution Sign, paragraph entitled "PCB Caution Sign."

3.7 CLEANUP

Maintain surfaces of the PCB control area free of accumulations of PCBs. Restrict the spread of dust and debris; keep waste from being distributed over work area.

Do not remove the PCB control area and warning signs prior to the Contracting Officer's approval. Reclean areas showing residual PCBs.

3.8 DISPOSAL

Comply with disposal requirements and procedures outlined in 40 CFR 761. Do not accept PCB waste unless it is accompanied by a manifest signed by the Government. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Government. Return a signed copy to the Government before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities.

3.8.1 Certificate of Disposal

40 CFR 761. Submit to the Government within 30 days of the date that the disposal of the PCB waste identified on the manifest was completed. Certificate for the PCBs and PCB items disposed shall include:

a. The identity of the disposal facility, by name, address, and EPA identification number.

b. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

c. A statement certifying the fact of disposal of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

d. A certification as defined in 40 CFR 761, Section 3.

3.8.1.1 Payment Upon Furnishing Certificate of Disposal of PCBs

Payment will not be made until the certificate of disposal has been furnished to the Contracting Officer.

3.8.2 Disposal by the Government

Load and haul PCBs to the storage site operated by the Defense Reutilization and Marketing Office (DRMO). If the primary site is filled to capacity, contact the Public Works Center Hazardous Waste Branch Environmental Engineer to determine an alternate storage site. The transport distance to any storage site shall not exceed the distance between the project site and the DRMO storage site.

3.8.2.1 Delivery

3.8.2.2 DD Form 1348-1

Prepare DD Form 1348-1 Turn-in Document (TID), which will accompany the

PCBs to the storage site. Ensure that a responsible person from the activity that owns the PCBs signs the DD Form 1348-1.

3.8.2.3 Payment Upon Furnishing DD Form 1348-1

Payment will not be made until a completed DD Form 1348-1 has been furnished to the Contracting Officer.

-- End of Section --

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MOLD REMEDIATION
05/11

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA IMOM08-679	(2008) Recognition, Evaluation, and Control of Indoor Mold

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE Z9.2	(2012) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

INSTITUTE OF INSPECTION, CLEANING, AND RESTORATION CERTIFICATION (IICRC)

IICRC S100	(2002) Standard Reference Guide for Professional Carpet Cleaning
IICRC S500	(2006) Standard and Reference Guide for Professional Water Damage Restoration

NATIONAL AIR DUCT CLEANERS ASSOCIATION (NADCA)

ACR	(2013) Standard for Assessment, Cleaning, and Restoration of HVAC Systems

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

29 CFR 1910.134	Respiratory Protection
29 CFR 1926.1101	Asbestos

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS 1.2.1

AIHA

American Industrial Hygiene Association.

1.2.2 AFU

Air filtration unit with High Efficiency particulate air (HEPA) filtered vacuum and / or exhaust ventilation equipment with a filter system capable of collecting and retaining microbial contamination ASSE Z9.2. Filters shall retain 99.97 percent of particles 1.2 by 10-6 inch or larger as indicated in UL 586.

1.2.3 Categories of Water

(IICRC S500) Category 1 Water: Water originating from a source that does not pose substantial harm to humans. Also referred to as "clean water."

Category 2 Water: Water containing a significant degree of chemical, biological and/or physical contamination and having the potential to cause discomfort or sickness if consumed by or exposed to humans. Also referred to as "gray water."

Category 3 Water: Grossly unsanitary water, containing pathogenic agents, arising from sewage or other contaminated water sources and having the likelihood of causing discomfort or sickness if consumed by or exposed to humans. This category includes all forms of seawater, ground surface water and rising water from rivers or streams. Also referred to as "black water."

1.2.4 Certified Industrial Hygienist (CIH)

A Certified Industrial Hygienist refers to an individual that has been certified by the American Board of Industrial Hygiene (ABIH), with professional qualifications and experience as required for an industrial hygienist, as presented in the definition of "Industrial Hygienist."

1.2.5 Complete Interior Building Demolition (Complete Gut)

Interior finishes of the building have been removed to expose basic structural elements.

1.2.6 Containment

Physical separation and engineering controls required to prevent contamination of undamaged materials and occupied areas. The level of containment varies depending on the extent of the contamination.

1.2.6.1 Source Containment

Use when the contaminated surface area is less than 10 square feet, in non-residential buildings only. At a minimum, source containment shall include the following:

a. Isolation of Work Areas. Install polyethylene barriers to isolate the areas or material to be demolished / remediated from non-remediation areas.

b. Floor protection. Maintain protection for finished floors through all construction activities.

c. HEPA vacuum to control dust created during the demolition. Hold HEPA vac intake at source of dust.

1.2.6.2 Limited Containment

Use when contaminated surface area is between 10 square feet and 100 square feet per room in non-residential buildings and contaminated surface area less than 100 square feet per room in residential buildings. At a minimum, limited containment shall include the following:

a. Containment. For residential buildings, a containment shall include the entire room where work is being performed. The containment shall not extend past the extents of the room unless there are instances of contamination extending from one room to the next. For non-residential buildings, the containment shall include the area to be remediated, plus enough additional area to allow for all equipment and work activities.

b. Isolation of Work Areas. Install polyethylene barriers to isolate the areas to be demolished / remediated.

c. Floor protection. Maintain protection for finished floors through all construction activities.

d. Air Filtration / Pressurization Control. Install AFUs with HEPA filters in the containment. Configure the AFUs with splitters / diverters to allow some of the air to recirculate within the containment. Discharge the remainder of the air directly to the outside to maintain an overall negative pressure in the containment of 0.02 inch water column minimum to 0.04 inch water column maximum relative to the outside and other adjacent spaces not undergoing remediation. AFUs shall filter a minimum of four air changes per hour and a maximum of six air changes per hour.

e. Protection for all items remaining in the containment. Protective devices shall prevent physical damage (e.g., scratches and dents) and shall provide a positive seal to prevent dust from settling in or on the items.

f. Containment Entrance. Install a triple-flap poly "door" to be used during demolition to minimize egress and provide a good separation between containment and occupied areas of the house / building.

1.2.6.3 Full Containment

Use when contaminated surface area is greater than 100 square feet in both residential and nonresidential buildings. At a minimum, full containment shall include the following:

a. Containment. For residential buildings, a containment shall include the entire room where work is being performed. The containment shall not extend past the extents of the room unless there are instances of contamination extending from one room to the next. For non-residential buildings, the containment shall include the area to be remediated, plus enough additional area to allow for all equipment and work activities.

b. Isolation of Work Areas. Construct polyethylene barriers to isolate the areas to be demolished / remediated.

c. Floor protection. Maintain protection for finished floors through all construction activities.

d. Air Filtration / Pressurization Control. Install AFUs with HEPA filters in the containment. Configure the AFUs with splitters / diverters to allow some of the air to recirculate within the containment. Discharge the remainder of the air directly to the outside to maintain an overall negative pressure in the containment of 0.02 inch water column minimum to 0.04 inch water column maximum relative to the outside and other adjacent spaces not undergoing remediation. AFUs shall filter a minimum of four air changes per hour and a maximum of six air changes per hour.

e. Protection for all items remaining in the containment. Protective devices shall prevent physical damage (e.g., scratches and dents) and shall provide a positive seal to prevent dust from settling in or on the items.

f. Decontamination. Construct a decontamination airlock for entry into and exit from the work area. The airlock shall be used to HEPA vacuum the sealed bags of contaminated debris. When possible, the decontamination airlock shall be located so that the sealed bags can be passed directly from the airlock to the outside, through a door or window.

g. Containment Entrance. Install a triple-flap poly "door" at the entrance to the airlock, and between the airlock and the work area during demolition to minimize egress and provide a good separation between containment and occupied areas of the house / building.

1.2.6.4 Unoccupied Building Containment

Use when a building is unoccupied and large amounts of mold growth are present throughout the building:

a. Containment. The containment consists of the entire building. Install AFUs with HEPA filters in the building. Configure the AFUs to recirculate within the active remediation area. AFUs shall filter a minimum of four air changes per hour and a maximum of six air changes per hour based on the size of the area undergoing active remediation.

b. Isolation of Work Areas. Install polyethylene barriers to isolate the areas where remediation is not required. AFU discharge may be used to positively pressurize non-remediation areas from areas undergoing remediation to prevent the movement of spores into "clean" areas.

c. Floor Protection. Maintain protection for finished floors through all construction activities.

d. Protection for all items remaining in the containment. Protective devices shall prevent physical damage (e.g., scratches and dents) and shall provide a positive seal to prevent dust from settling in or on the items.

e. Decontamination. Construct a decontamination airlock for entry into and exit from the building.

f. Containment Entrance. A triple-flap poly "door" shall be used at the entrance to the work area during demolition to minimize egress.

1.2.6.5 Cleaning Containment

A temporary containment structure set up to clean items removed from the containment. At a minimum, the cleaning area shall contain:

a. Two chambers. Construct walls with polyethylene. Items will be cleaned in the first chamber. The clean items shall be stored in the second chamber.

b. Air Filtration / Pressurization Control Cleaning Chamber. Install AFUs with HEPA filters in the cleaning chamber. Configure the AFUs with splitters / diverters to allow some of the air to recirculate within the containment. Discharge the remainder of the air directly to the outside to maintain an overall negative pressure in the containment of 0.02 inch water column minimum to 0.04 inch water column (maximum) relative to the storage chamber.

c. Air Filtration, Storage Chamber. Install AFUs with HEPA filters in the storage chamber. The AFUs shall be configured to allow air to recirculate within the chamber. AFUs shall filter a minimum of four air changes per hour and a maximum of six air changes per hour.

d. Containment Entrance. Install a triple-flap poly "door" at the entrance to the cleaning chamber, between the cleaning and storage chambers, and at the exit of the storage chamber to minimize egress and provide a good separation between the chambers.

1.2.7 Decontamination Unit (Airlock)

An enclosed area adjacent to, and connected to, a regulated work area. It consists of various rooms that are used for the decontamination of workers, equipment, and materials.

1.2.8 Dehumidifier

Mechanism or machine to remove moisture from the air.

1.2.9 Detergent

A cleaning agent. The term refers to a prepared compound that may include surfactants, builders, dry solvents, softeners, etc, but does not include true soap.

1.2.10 Disinfectants or Biocide Sanitizing Solutions

One of three groups of antimicrobials registered by the EPA for public health uses. The EPA considers an antimicrobial to be a disinfectant when it destroys or irreversibly inactivates infectious or other undesirable organisms, but not necessarily their spores.

1.2.11 EPA

U.S. Environmental Protection Agency.

1.2.12 Fungicidal Agents, (EPA)

A coating material that contains an EPA registered fungicide that inhibits the spread and growth of mold with the ability to withstand moist and humid conditions.

1.2.13 HEPA Filter

A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97 percent of all particulate larger than 1.2 by 10-6 inch.

1.2.14 HVAC

Heating, Ventilating, and Air Conditioning (System).

1.2.15 Industrial Hygienist (IH)

Industrial Hygienist (IH) refers to an individual designated and provided by the Contractor that is a professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational and indoor air quality hazards. Education must include a minimum 12 semester hours or quarter hour equivalent of chemistry and 18 additional semester hours or quarter hour equivalent of courses in any combination of chemistry, physics, engineering, health physics, environmental health, biostatistics, biology, physiology, toxicology, epidemiology, or industrial hygiene. The Industrial Hygienist shall be under the supervision of a Certified Industrial Hygienist.

1.2.16 Microbial Remediation Supervisor

Individual responsible for the execution of the microbial remediation work as defined by the scope of work. This individual shall have documented training in microbial remediation and have at least three years experience in microbial remediation work. Remediation contractor's on-site supervisor shall have one of the following certifications: Council-Certified Mold Remediator (CMR), or Council-Certified Mold Remediation Supervisor (CMRS) as certified by the American Council for Accredited Certification, or Applied Microbial Remediation Specialist (AMRS), Institute of Inspection, Cleaning, and Restoration Certification (IICRC) or Contracting Officer approved equivalent.

1.2.17 Non-Porous Material

A material that does not absorb nor is easily penetrated by liquids, especially water. Generally, non-porous materials have a permeable factor of less than 1. Some examples are metal, glass, plastic, ceramic tile, etc.

1.2.18 Occupied Spaces (Areas)

The phrase "occupied space" within this specification refers to spaces that are occupied by unprotected non-remediation personnel while work is in progress. It also refers to areas adjacent to work areas that are not currently undergoing remediation.

1.2.19 Personal Protective Equipment (PPE)

Any material or device worn to protect a worker from exposure to, or contact with, any harmful material or force. PPE must be cleaned or disposed of prior to removal from the remediation work area.

1.2.20 Poly

Polyethylene sheet with a minimum thickness of 6 mils.

1.2.21 Porous Material

Permeable materials having the physical properties that allow liquids or gasses to pass through. These materials include but are not limited to the following: gypsum wall board, insulation, wallpaper, ceiling material, carpet, padding, paper goods (i.e., cardboard boxes, loose paper, books, etc.), stuffed furniture, wicker, fabrics, etc.

1.2.22 Pressure Differential Measuring Instrument

Device used to measure the relative pressure difference between the work area and areas outside the work area. For mold remediation, the device must measure accurately in the 0 to 0.04 inch range.

1.2.23 Semi-porous Material

A material that can absorb liquids if exposed over long periods of time. These materials include but are not limited to wood, concrete, linoleum, vinyl wall covering, wooden or hardboard furniture, plaster, etc.

1.2.24 Ventilation System Mold Remediator Qualifications (VSMR)

An individual certified by the North American Duct Cleaning Association (NADCA) to clean HVAC systems.

1.2.25 Work Area

The area where remediation operations are actively performed and controlled to prevent the spread of dust / spores and entry by unauthorized personnel. A work area is the space, group of spaces, or the building, as defined by the Microbial Assessment Survey.

1.3 REQUIREMENTS

1.3.1 Description of Work

The Contracting Officer will furnish the Contractor, in the contract documents, an initial Microbial Assessment Survey with containment categories and remediation methods specified for each work area and material within the work area.

The Contracting Officer's initial Microbial Assessment Survey specified below shall be furnished and certified by a qualified assessor authorized by the Contracting Officer to do such work. The initial survey is included in the solicitation documents at the end of this specification section.

Provide mold remediation work including the handling and control of mold contaminated materials and the resultant procedures and equipment required to protect workers, the environment and occupants of the building or area, or both, from contact with mold products and spores. The work also includes the disposal of any mold contaminated materials generated by the work. The mold removal work includes the demolition and removal of mold contaminated materials as indicated in each task order. Provide containment and

engineering control techniques as outlined in this specification. All mold contaminated material removal work shall be supervised by a microbial remediation supervisor as specified herein.

No work in this specification section shall be provided by any person, contractor, or contracting entity involved in the preparation of the contract documents of which this specification section is a part.

The following microbial remediation specifications apply to the cleaning / removal and disposal of fungally-contaminated porous, semi-porous and non-porous surfaces within various types of structures. The level of containment and requirements for cleaning and remediation of materials will depend on the condition of the space and materials being remediated.

Immediately after award of the contract, prepare a preliminary visual assessment report using the standard microbial assessment form (Appendix A) to document the differences in the pre-remediation condition of the work areas as compared to the government provided Microbial Assessment Survey. Only address the differences between the pre-remediation condition of the work areas and the government provided Microbial Assessment Survey. If required to indicate the differences, include the HVAC systems inspection required elsewhere in this specification section. Submit this written pre-remediation condition report to the Contracting Officer for approval and instructions to proceed.

After approval of the preliminary visual assessment report and having instructions from the Contracting Officer to proceed, prepare a microbial remediation plan for approval by the Contractor's Certified Industrial Hygienist. Microbial remediation plan shall include an assessment of the risk for people to occupy areas adjoining the remediation area while remediation work is occurring. Upon the Contractor's CIH approval of the plan, submit the plan to the Contracting Officer for approval.

The Contractor's CIH or IH shall monitor the site on a daily basis while remediation work is in progress, identifying work and/or work practices that are not in compliance with the approved microbial remediation plan, and performing all inspections required by this specification. The Contracting Officer may require the removal of any individual for non-compliance with quality requirements specified in the contract.

This specification section includes the protocol regarding proper disposal of the removed building material components from within the work site.

Use proper cleaning procedures, engineering controls, and apply best management practices to remove microbial growth and spore fallout from all surfaces and building materials to minimize the further release of microbial spores. Address semi-porous and nonporous surfaces within the facility in each cleaning phase of the project. Damp wipe and HEPA vacuum all surfaces, at a minimum. Remove and dispose of porous building materials that are supporting microbial growth.

1.3.2 Security Requirements

Prior to granting access to any work area (i.e., building, area, room, or space) for mold remediation work, a determination must be made by the government agency whether classified or controlled unclassified information (paper material and / or electronic media) or equipment is contained in the

work area(s).

If Contractor personnel require access to classified information or spaces to perform mold remediation work, the Government must issue the Contractor facility a DD Form 254 (Contract Security Classification Specification) prior to the initiation of the work under the contract. If the Contractor facility does not possess a valid DD Form 254 issued by the Defense Security Service (DSS), the Government will be required to submit a sponsorship request to DSS requesting that the Contractor be processed for and issued a current DD Form 254 at the appropriate level.

Access to classified information (paper material, electronic media, and equipment) must only be granted to authorized and appropriately cleared government and U.S. contractor personnel that possess a personnel security clearance commensurate with the level of information contained in the work area that requires a mold remediation effort.

Access to Controlled Unclassified information (i.e., For Official Use Only, Sensitive but Unclassified, Privacy Act Information, Export Controlled unclassified, etc.) can be granted to DOD cleared contractors, consultants and grantees that are conducting official business for the DOD or DON. Non-cleared U.S. contractor personnel who only require access to controlled unclassified information can be granted access if they get a favorable trustworthiness determination on an individual Facility Access Determination National Agency Check (FADNAC) submitted on their behalf by the government agency issuing the contract.

Classified information and controlled unclassified information must be safeguarded / secured, reproduced, and destroyed in accordance with SECNAV M-5510.36.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preliminary Visual Assessment Report; G

Microbial Remediation Plan; G

Worker Records;

Respiratory Protection Program; G

Certified Industrial Hygienist (CIH)/Industrial Hygienist (IH) Qualifications; G

Microbial Remediation Supervisor Qualifications; G

Ventilation System Mold Remediator Qualifications (VSMR); G

SD-03 Product Data

Personal Protective Equipment (PPE); G

Air Filtration Units;

Dehumidifiers;

Pressure Differential Measuring Instrument;

Fungicidal Agents, (EPA); G

Disinfectants or Biocide Sanitizing Solutions; G

SD-06 Test Reports

Daily Reports; G

SD-11 Closeout Submittals

Submittals at Completion of Remediation Work; G

1.4.1 Preconstruction Submittals

Within ten (10) days from the award of the contract and prior to the start of the work, submit to the Contracting Officer six copies of the following items for review and permanent file.

1.4.1.1 Preliminary Visual Assessment Report

A written report to document the pre-remediation condition of the work areas compared to the government provided Microbial Assessment Survey and the results of the HVAC systems inspection.

1.4.1.2 Microbial Remediation Plan

Submit a job-specific, detailed plan Approved by the Contractor's CIH to the Contracting Officer for final approval prior to start of work. The plan shall address the following items at a minimum:

a. Description of materials to be remediated, providing location and quantities (map if available), and methods to be used for remediation.

b. Types of biocides and fungicidal agents, (EPA).

c. Containment procedures to include description and locations of engineering controls and decontamination unit to include entry and exit procedures (provide sketch of floor plan showing location of containment barriers and decontamination units). Plan shall include locations of AFUs and AFU discharges to the outside.

d. Description of personal protective equipment to be used during the remediation.

e. Construction barricades and barriers in occupied areas.

f. HVAC Shut down and start-up procedures.

g. HVAC Evaluation and remediation procedures.

h. Moisture and relative humidity control procedures and equipment.

i. Packaging and disposal procedures.

j. Safety Precautions to include lockout / tag-out, fall protection, confined space entry procedures, and fire protection.

k. Description of the method to be employed to control cross contamination of areas not in the work area. This shall include a risk assessment related to the suitability of people to occupy areas adjoin the remediation area while remediation activities are ongoing.

l. IH Quality Control procedures to include visual inspection.

m. Procedures to control, abate, and dispose of Asbestos Containing Materials (ACM) and Lead Based Paint (LBP) coincident with microbial remediation. Before work in areas containing ACM and PACM is begun; Contractor shall identify the presence, location, and quantity of ACM, and/or PACM therein pursuant to paragraph (k)(1) of 29 CFR 1926.1101.

1.4.1.3 Respiratory Protection Program

Provide written copy of Contractor's Respiratory Protection program.

1.4.1.4 Worker Records

Provide the following documents for all workers, including supervisory personnel. If new workers are added to the crew, provide the same documentation for them.

Employee Instruction and Release Form: Provide documentation showing that each employee has been instructed on the following items:

a. Use and fit of respirators (for employees entering and working in the containment).

b. Protective clothing.

c. Protective measures.

d. Safety and Emergency Egress Procedures.

e. Site specific fall protection plan and training.

f. Microbial remediation hazards and practices including engineering controls and isolation. Training should include "hands on" training for microbial remediation supervisors.

g. Workers' release forms stating the potential hazards involved with the scope of the work.

Worker Training Certification: Submit copies of training certificates for each employee indicating that the employee has received training at the appropriate level for the work prescribed in the description of work.

1.4.1.5 Certified Industrial Hygienist (CIH)/Industrial Hygienist (IH) Qualifications

Submit the name, address, and telephone number of the Certified Industrial Hygienist (CIH) and Industrial Hygienist (IH). Provide copies of board certificates, resume to document field experience, and evidence that the CIH and IH have successfully completed training in microbial investigation and remediation.

1.4.1.6 Microbial Remediation Supervisor Qualifications

Onsite supervisor shall have one of the following certifications: Certified Mold Remediator (CMR), Certified Mold Remediation Supervisor (CMRS), or Applied Microbial Remediation Specialist (AMRS). Submit copies of supervisory training certificates.

1.4.2 Product Data

Within 10 days of contract award, submit product data for items identified for use in Microbial Remediation Plan.

1.4.3 Daily Reports

Prepare a written report for each day that microbial remediation work is being accomplished. Submit this report to the Contracting Officer by 1000 hours of the following day, attached to the Contractor Quality Control Report. Referred to collectively as the IH Daily Report, the report at a minimum shall include measurements of differential pressure and temperature and relative humidity in work areas, and detail any non-compliance issues observed.

1.4.4 Submittals at Completion of Remediation Work

Within 14 days of completion, provide the following information:

a. Supervisor Logs.

b. IH Daily Reports.

c. Photographic Logs.

d. Contractor's Industrial Hygienist Report certifying the microbial remediation is complete.

1.5 RECORD KEEPING

A Daily Project Log shall form a permanent record of the project. Secure and maintain these logs and any other required documentation as part of the permanent project file.

1.5.1 Daily Log

The Microbial Remediation Supervisor shall maintain a Daily Project Log. The Daily Project Log shall be used each day of the project to document the following information.

a. Date.

b. Name of Microbial Remediation Supervisor.

c. Name of Industrial Hygienist monitoring work area.

d. Number of workers on site.

e. Equipment utilized.

f. Brief description of daily work activities.

g. Listing of any non-compliance noted, emergencies, stop work orders (with detailed explanation), exhaust system pressure differential recordings and descriptions of any other significant events.

PART 2 PRODUCTS

2.1 DISINFECTANTS, BIOCIDES, SANITIZING SOLUTIONS AND FUNGICIDAL AGENTS, (EPA)

Shall be approved by EPA for the use detailed in the Microbial Remediation Plan and used in accordance with the manufacturer's specifications.

PART 3 EXECUTION

3.1 EQUIPMENT

Provide protective clothing and respirators as required by the Microbial Remediation Plan for use by any authorized visitors. Provide manufacturer's certificate of compliance for all equipment used to contain the microbial contamination. Contractor shall not be required to certify that visitors entering work areas be capable of wearing respirators.

3.1.1 Respirators

Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services. Provide personnel engaged in set-up, pre-cleaning, cleanup, handling, and removal of contaminated materials with the appropriate respiratory protection as specified in 29 CFR 1910.134. Microbial remediation plan shall consider Table 17.1 in AIHA IMOM08-679 "Recognition, Evaluation, and Control of Indoor Mold", which lists the minimum levels of respiratory protection based on the activity and size of the remediated area.

3.1.2 Protective Clothing

Provide all workers with protective clothing as appropriate for the work being accomplished, as required by the Microbial Remediation Plan.

Do not permit any person to enter the work area without the appropriate protective clothing and equipment.

3.1.3 Warning Signs and Labels

Provide bilingual warning signs printed in English and Spanish at all approaches to the work areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Warning signs may be in the form of continuous plastic tape. The warning signs shall have black characters on a yellow background.

WARNING
DO NOT ENTER
MICROBIAL REMEDIATION WORK IN PROGRESS

Alternate wording for the warning signs will be approved by the Contracting Officer.

3.1.4 Dehumidifiers

Install and use dehumidifiers as needed during the remediation to maintain relative humidity below 60 percent in the work area. Drain the condensate water to a permanent drain, or empty as needed to prevent water overflowing from the dehumidifiers.

3.1.5 Air Filtration Units (AFU)

Install and use AFUs with HEPA filters, and manufacturer specified pre-filters, as part of the exhaust ventilation system to develop and maintain the specified desired air pressure differential inside the enclosed work area relative to the outside areas. The Contractor shall be responsible for acquiring and paying for any licenses needed for use of any equipment, including but not limited to, air pressure differential systems and air filtration systems.

Replace HEPA filters and pre-filters for AFUs as required to maintain pressurization performance requirements during demolition and cleaning. Do not reuse filters. Bag used filters at a minimum in clear 6 mil polyethylene bags within the containment and disposed as contaminated waste.

Discharge air from any AFUs located in the work area containment to the outside environment when creating a negative pressure containment to create a negative pressure relative to occupied areas of 0.02 inch H2O to 0.04 inch H20. Discharge air in excess of that required for creating the proper negative pressure to the work area. The AFUs shall provide four to six air changes per hour in the work area. Under no circumstances may air from AFUs discharge to an occupied area. Coordinate location of window sashes or doors required for discharge openings with the Contracting Officer. Seal around openings used for discharge of exhaust air airtight. Exhaust discharge openings may be constructed of plywood.

Seal all exhaust and intake openings in AFUs with one layer of 6 mil polyethylene sheeting when not in use.

3.1.6 Vacuum Cleaners Equipped with HEPA Filters

Provide vacuum cleaners equipped with HEPA filters designed for continuous operation to perform the work in a timely and efficient manner.

Provide nozzle attachments as required to adequately remove all dust. As a minimum, nozzle attachments shall include crevice and extended bristle brush nozzles. Any vacuum that is not equipped with a HEPA filter shall not be used at anytime.

Provide sufficient vacuum cleaners equipped with HEPA filters designed for continuous operation in the work area during microbial remediation inside the containment area.

Provide additional vacuum cleaners equipped with HEPA filters in the enclosed work area during remediation or cleaning work as required by the size (area) of the containment and to maintain timely progress of the work.

3.2 GENERAL REQUIREMENTS

3.2.1 Pre-Microbial Remediation Work Conference

Meet with the Contracting Officer prior to beginning work to discuss in detail the Microbial Remediation Plan, including work procedures and safety precautions. Once approved by the Contracting Officer, the plan shall be enforced as if a part of this specification. Any variances to the specification as a result of the plan shall be specifically identified to allow for free discussion and approved by the Contracting Officer in writing prior to starting work. Before work in areas containing Asbestos Containing Material (ACM) and Presumed Asbestos Containing Materials (PACM) and Lead is begun, Contractor shall identify the presence, location, and quantity of ACM, PACM and Lead. Ensure proper notification of regulatory authorities. Contractor shall consult with Contracting Officer to obtain facility ACM / LBP surveys.

3.2.2 Containment Entry / Exit Procedure

Ensure that each worker and authorized visitor follows entry and exit procedures detailed in the Microbial Remediation Plan.

3.3 REMOVAL PROCEDURES

3.3.1 Protection of Existing Work Areas

Perform work in a manner to minimize the damage or contamination to areas outside or directly adjacent to the work area. Contractor is required to inspect areas inside and outside proposed work areas to identify existing damage and notify Contracting Officer prior to start of work.

Where materials outside work area are damaged or contaminated as a result of the Contractors work efforts as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting officer. Should adjacent or outside areas become contaminated as a result of the Contractors work efforts the work shall stop immediately. The newly contaminated areas shall be cleaned and verified by visual inspection by the IH. The work may proceed at the discretion of the Contracting Officer once the area has been verified as restored.

3.3.2 Remediation of Fungally Contaminated Building Materials

The removal of contaminated materials shall follow in general the listed sequence of work. The Contractor may make changes to improve work flow with the approval of the Contracting Officer.

a. Provide level of containment and PPE required by the Microbial Remediation Plan.

b. Disable all HVAC units and exhaust fans in the area to be remediated.

c. Protect materials to remain in work area. Where possible, all

materials to be salvaged should be cleaned in place to prevent possible cross-contamination created by moving materials through non-remediation areas.

d. Remove undamaged items and materials to be cleaned and salvaged from the work area. Materials shall be stored in an area with relative humidity maintained below 60 percent and where temperatures will not damage the material. Notify Contracting Officer of existing damage to items prior to removal.

e. Set up containments, including protection of materials remaining within the containment and AFUs. Notify Contracting Officer that the area is prepared for remediation activities.

f. Pre-demolition inspection by the Contracting Officer.

g. Demolition and removal / cleaning of contaminated materials.

h. Post-remediation inspection by the Contracting Officer.

i. Perform final cleaning in the containment.

j. Clean carpet in the containment.

k. Clearance inspection by the Contracting Officer.

l. Duct and HVAC cleaning, if necessary.

m. Deconstruction of containment, removal of AFUs.

n. Clean previously removed items prior to returning to occupied area.

3.3.3 Remediation Procedures

Procedures for remediation depend on the amount of mold growth and the type of material with fungal growth.

3.3.3.1 Remediation of Non-Porous Materials

The method of remediating non-porous items shall be:

a. HEPA vacuum all surfaces.

b. Damp wipe all surfaces using clean water or a detergent solution.

3.3.3.2 Semi-Porous Materials (Unfinished Wood)

The method of remediating unfinished wood-based items, including wood and wood framing in wall cavities, shall be:

a. Cleaning

(1) HEPA vacuum all surfaces.

(2) Scrub surfaces with a brush and detergent to remove mold.

(3) HEPA vacuum all surfaces to remove dust.

(4) Repair finishes as required to match original.

b. Removal

Where unfinished wood product has been structurally damaged, remove and replace with an equivalent product. This shall include wall studs and sheathing, such as OSB used in flooring, wall, or roof construction.

3.3.3.3 Semi-Porous Materials

The method of surface cleaning semi-porous materials such as concrete, vinyl wall covering, linoleum, leather furniture, and finished wood products shall be:

a. HEPA vacuum all surfaces.

b. Damp wipe surfaces with using clean water or a detergent solution. Avoid over-wetting the material.

3.3.3.4 Porous Materials

a. Carpet

(1) Removal: Replace carpet that has remained wet for 48 hours or longer.

(2) Cleaning: Use a dry absorbent compound cleaning method as designated by IICRC S100. This method uses an absorbent compound to dissolve, suspend and absorb carpet soils. It does not add moisture back into the carpet.

b. Gypsum Wallboard (GWB)

(1) Removal: Replace Gypsum Wallboard that has remained wet for 48 hours or longer, or has visible mold growth. Where removal of GWB exposes insulation, remove and replace the insulation with an insulation having equal characteristics for insulating value and permeability.

(2) Surface Cleaning: Where GWB has a small amount of surface mold growth and the GWB is structurally sound, a surface cleaning method may be used with the permission of the Contracting Officer. The method of surface cleaning GWB shall be HEPA vacuum all surfaces. Surface cleaning shall not be used where mold growth penetrates wallboard substrate.

c. Ceiling Tile

(1) Removal: Replace ceiling tile that has remained wet for 48 hours or longer, or has visible mold growth.

(2) Surface Cleaning: Where settled dust on ceiling tiles contains mold spores and the ceiling tile is structurally sound, is not sagging, and has not been wet, a surface cleaning method may be used with the permission of the Contracting Officer. The method of surface cleaning ceiling tile shall be HEPA vacuum all surfaces. Surface cleaning shall not be used where mold growth is occurring on ceiling tiles.

d. Paper Materials

Contractor personnel cannot be granted access to classified information and / or Controlled Unclassified Information until they have met the security requirements stated in the paragraph SECURITY REQUIREMENTS.

(1) Removal: Discard paper materials that have remained wet for 48 hours or longer, or that have visible mold growth. Classified and Controlled Unclassified Information must be destroyed by appropriately cleared contractor personnel using an approved DOD destruction method that is authorized for the specific level of information.

(2) Containment: Where paper materials, such as personnel records must be retained, the following containment methods may be used with the permission of the Contracting Officer. The method of containment for paper products shall be:

(a) Thoroughly dry the paper material. Classified and Controlled Unclassified Information must be safeguarded at all times in a GSA approved security container, restricted area, vault, or under the direct physical control of appropriately cleared contractor personnel.

(b) Where routine access to the material is required, a copy shall be made. Contractor personnel shall not reproduce copies of classified information or controlled unclassified information without the prior written approval of the Contracting Officer and the NAVFAC LANT security department. If approval is obtained, only appropriately cleared Contractor personnel shall be authorized to reproduce the information and they must use only DOD authorized reproduction equipment.

(c) When not in use, the classified and controlled unclassified information must be secured in an approved GSA security container, restricted area, or vault. Limit access to the container to only appropriately cleared Contractor personnel. Implement an access procedure involving opening the container in a secure area with provision for capturing mold spores and respiratory protection for workers opening the container for these materials. Store the container in an area where the relative humidity is maintained below 60 percent to prevent further mold growth.

e. Textiles

(1) Discard textiles with visible mold growth.

(2) Clean textile based items, including clothing, linens, and toys that do not have visible mold growth, but have been wet, in standard commercial or residential washing machines with standard washing machine detergent.

(3) Dry all items completely before returning to the building / house.

(a) When possible, use dryers to dry items.

(b) If dryers will cause irreversible harm to the item, hang the item on a drying rack in a temperature and humidity controlled space. Discard items not dry within 48 hours.

f. Upholstered Furniture

(1) Removal: Discard upholstered furniture that has remained wet for 48 hours or longer, or that have visible mold growth.

(2) Cleaning: Clean upholstered furniture that has been exposed to mold spores but does not have visible mold growth by HEPA vacuuming upholstery and wood or metal structure, followed by a damp wipe of semi-porous or non-porous portions of the furniture.

3.4 DETAILED SEQUENCE OF WORK FOR MOLD REMOVAL UNDER CONTAINMENT

3.4.1 Preparation for Remediation Work

a. Provide level of containment and PPE required for the remediation based on the Microbial Remediation Plan.

b. Disable all HVAC units and exhaust fans in the area to be remediated.

c. Remove undamaged materials from the work area if they are to be salvaged but cannot be cleaned in place. Store materials in an area with relative humidity maintained below 60 percent and where temperatures will not damage the material. Notify Contracting Officer of existing damage to items prior to removal. Clean materials using procedures detailed in Remediation Procedures.

d. Remove supply diffusers, return grilles and exhaust grilles. Clean diffusers and grilles using procedures detailed in Remediation Procedures.

e. Construct containment barriers. Existing walls can be used as a portion of the containment barriers if existing openings in walls (such as doors, wall openings, vents, etc.) are sealed using polyethylene.

f. Install the AFUs and dehumidifiers.

g. Seal supply, return, and exhaust openings with polyethylene sheeting and protect intakes to air handling units. Air handling units shall remain off.

h. Install all equipment needed for removal work in the containment area to minimize egress during demolition.

i. The Contracting Officer will inspect the containment to verify that the containment is properly constructed and the containment area has an overall negative pressure of 0.02 to 0.04 inch water column relative to the outside and adjacent work areas not undergoing active remediation, prior to beginning demolition work.

3.4.2 Demolition

a. Remove mold contaminated materials to be discarded, such as paper, and furniture. Double bag material in 6 mil poly bags. Seal poly bags using duct tape inside the containment. HEPA vacuum bags before removing them from the containment or airlock. When possible, pass the bags directly from the containment or airlock to the outside. Transport bags to a dumpster. Do not leave the bags at the building / house.

b. Remove contaminated gypsum wallboard (GWB) at the preliminary limits of demolition specified in the Microbial Remediation Plan. Inspect back side of removed GWB. If mold is observed on the back side of the GWB, report this condition to the Contracting Officer. After obtaining Contracting Officer approval, continue removing GWB until no mold is observed. If hidden mold is discovered that will extend past the extents of the containment, stop work immediately and reconstruct the containment to extend past the suspected contamination. Re-evaluate level of containment and PPE. Continue to operate AFUs during reconfiguring of containment.

c. Remove drywall by cutting in pieces as large as possible to minimize aerosolization of fungal spores. Drywall screws can either be backed out during removal or later during cleanup.

d. Use dust collection attachments on all power tools, such as sanders, saws, etc., to capture dust created when using the tools. Outlet of dust collector should discharge into inlet of AFU.

e. Remove fiberglass insulation behind removed gypsum board.

f. If wood studs are contaminated, scrub them with a brush and detergent to remove mold. Replace wood studs with damage severe enough to reduce the structural capacity of the member. Prior to removal of any structural member consult with the Contracting Officer.

g. Clean all metal framing with a dilute detergent solution. Clean metal framing with light rust using steel wool and coat with a rust inhibiting paint. Replace metal framing with rust damage severe enough to reduce the structural capacity of the member. Prior to removal of any structural material, consult with the Contracting Officer.

h. Remove contaminated carpet scheduled for removal.

i. Place removed gypsum board, insulation, carpet and remaining debris in two layers of 6 mil poly bags. Seal poly bags using duct tape inside the containment. HEPA vacuum bags before removing them from the containment or airlock. When possible pass the bags directly from the containment or airlock to the outside. Transport bags to a dumpster. Do not leave the bags at the building / house. Remediation workers shall HEPA vacuum their PPE, then remove them within the airlock chamber. Discard disposable coverall suits into a 6 mil poly bag.

3.4.3 Post-Demolition Inspection

a. The Contracting Officer will inspect the containment area to verify that all contaminated materials have been removed.

b. Allow a minimum of 12 hours after completion of removal work, with AFUs operating, for airborne dust in the containment to settle and / or be removed by the AFUs.

3.4.4 Cleaning after Demolition, and Cleaning of Settled Spores from Porous / Non-Porous Materials

a. Continue to operate AFUs during cleaning.

b. Clean exposed surfaces.

(1) HEPA vacuum all surfaces.

(2) Damp wipe all non-porous exposed surfaces including polyethylene sheets used to protect materials, external surfaces of ductwork, studs, and floors with clean rag and clean potable water or detergent solution.

(3) Remove poly sheeting inside the containment.

(4) HEPA vacuum all surfaces protected by poly sheeting.

(5) Damp wipe non-porous surfaces protected by poly sheeting with clean water or a detergent solution.

(6) Clean carpet using procedures in Remediation of Fungally Contaminated Building Materials.

c. Final clearance inspection will be conducted by Contracting Officer. Clearance inspections will be performed using the procedures detailed in Post-Remediation Inspection. Maintain containments in place until spaces are inspected and accepted by the Government as being fully remediated. The Government will determine whether the Contractor shall conduct additional cleaning and repeat the clearance process.

3.5 DUCT AND HVAC SYSTEM CLEANING

3.5.1 Contractor Qualifications

a. The HVAC cleaning contractor shall be a certified member of NADCA.

b. The HVAC cleaning contractor shall have at least one individual with Ventilation System Mold Remediator Qualifications certified by NADCA onsite during duct and HVAC system cleaning.

3.5.2 Inspection

IH shall visually inspect the HVAC system serving all work areas (or as required in the initial Microbial Assessment Survey performed by the Government), and determine if additional remediation is needed to clean the HVAC system, thus preventing re-contamination. Notify the Contracting Officer of the inspection results. The Contractor must receive written approval from the Contracting Officer before proceeding with HVAC microbial remediation.

a. Follow requirements of the NADCA ACR "Standard for Assessment, Cleaning, and Restoration of HVAC Systems".

b. Using a "gassing" or "fogging" method of cleaning with gaseous chlorine dioxide or ozone will not be allowed.

c. Disable all HVAC equipment prior to cleaning any component of the system.

d. The method of cleaning the air handling units, terminal units, blowers and exhaust fans shall be:

(1) Construct a limited containment around equipment to be cleaned. Provide appropriate PPE for workers.

(2) Remove filters. Seal filters in 6 mil poly bags for disposal.

(3) Disassemble units as necessary to clean components. Contractor is responsible for reassembling equipment after cleaning.

(4) Clean disassembled components within the containment or in a separate two chamber cleaning containment. Seal disassembled components in 6 mil poly bags for transport out of building / house.

(5) HEPA vacuum all surfaces.

(6) Damp wipe all non-porous surfaces and components with clean water or a detergent solution.

e. The method of cleaning HVAC coils shall be:

(1) Clean coils using a method which will render the coil visibly clean. Coil cleaners shall be non-acidic / alkaline, detergent based. Clean condensate drain pans. The drain for the condensate drain pan shall be operational during the cleaning.

(2) Rinse coils and drain pans with clean water to remove any latent residues.

(3) Cleaning methods shall not cause damage to the coil surface or fins.

(4) Cleaning must restore the coil pressure drop to within 10 percent of the pressure drop measured when the coil was first installed. If the original pressure drop is not known, the coil shall be considered clean only if the coil is free of foreign matter and chemical residue.

f. The method of cleaning the duct system shall be:

(1) During cleaning, connect a vacuum collection system to the downstream end of the section being cleaned. The vacuum collection device must be of sufficient power to render all areas of duct being cleaned under negative pressure relative to rooms and areas of duct not being cleaned. Negative pressure must be verified at the furthest point from the collection system with a micromanometer and verification measurements included in the Daily Report.

(2) Equip the vacuum collection systems with HEPA filters. Exhaust the vacuum collection systems directly to the outside.

(3) Use mechanical agitation devices to dislodge debris adhered to the ductwork, such that debris may be safely conveyed to vacuum collection devices. Cleaning methods shall not damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork.

(4) HEPA vacuum duct surfaces.

(5) When possible, damp wipe metal duct surfaces with clean water or detergent solution. Do not wet fibrous glass thermal or

acoustical insulation.

(6) Identify areas where there is evidence of damage to or uncleanable mold in duct insulation. The Contracting Officer will make the decision to discard the insulation, if necessary.

g. Final clearance of HVAC and duct system will be based on a visual assessment (no visible dust, no visible mold) by Contracting Officer.

3.6 FIRE PROTECTION

The Contractor shall provide portable fire extinguishers within the containment area and outside the decontamination unit. Fire extinguishers shall be rated for the class of fire hazards in the work area and shall be sized for coverage of the areas within the containment. At a minimum, one 10 pound ABC fire extinguisher for every 1,000 square feet shall be strategically placed around the containment. Personnel shall be trained for emergency egress and the use of fire extinguishers. Notify fire officials of work activities as required.

3.7 CONSTRUCTION BARRIERS

a. Provide interior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain. Shoring, bracing or support will be necessary when structural wood studs or metal framing need to be removed and replaced when they cannot be cleaned.

b. Do not disturb microbial-contaminated building materials while isolating work areas. This precaution prevents the release of microbial spores.

c. Workers shall wear respirators and other PPE as outlined in the microbial remediation plan when installing critical barriers where microbial contaminated surfaces (walls or surfaces with visible settled dusts) are likely to be disturbed. Operate an AFU if disturbance is likely during setup.

d. Monitor the air pressure differential across work area containments. The monitoring system shall be in place before the start of remedial activities. Verification by the Industrial Hygienist is required prior to the start of the microbial remediation.

3.8 QUALITY ASSURANCE / QUALITY CONTROL REQUIREMENTS

3.8.1 Contractor Qualifications

Work shall be performed by a qualified remediation contractor. Contractor shall carry insurance that specifically covers mold remediation.

Remediation contractor's on-site supervisor shall have one of the following certifications: Certified Mold Remediator (CMR), Certified Mold Remediation Supervisor (CMRS), or Applied Microbial Remediation Specialist (AMRS). Qualified supervisor shall be onsite whenever active remediation is being performed. Set-up activities may be performed without supervisor present; qualified supervisor shall review set-up prior to start of work.

Mold remediation workers shall be given training in PPE and mold remediation activities as required for their particular job. Microbial

remediation plan shall provide details of worker training.

3.8.2 Waste Management and Removal

Keep the site and work area free from accumulations of dust, waste materials, or rubbish caused by Contractor operations and free from any flammable materials or other sources of fire hazard. Remove all waste materials and rubbish from and about the work site in strict accordance with the specifications and applicable codes and regulations.

3.8.3 Post-Remediation Inspection

Clean up all debris and dust in interior spaces outside the work area resulting from the Contractor's remediation work.

After all visible accumulations of material and debris are removed from the containment, provide the Contracting Officer a 24-hour notice for a final clearance visual inspection. The Contracting Officer and Contractor's Industrial Hygienist shall conduct a thorough visual inspection of the work area. If during this inspection any visible debris and/or microbial contamination are observed, the Contractor shall re-clean the work area without additional cost to the Government.

3.8.3.1 Clearance

a. Clearance Criteria

Clearance will be based on visual assessment (all visible mold removed, all visible dust removed, based on a "white glove" test) by Contracting Officer. "White glove" test shall consist of wiping the surface with a clean cloth of color suitable to reveal expected type of dust. For most surfaces, a white cloth is suitable. For GWB dust, a dark cloth may be more appropriate.

b. Failed remediation areas will be recleaned and the AFUs kept in operation another 12 hours, followed by another visual assessment. Subsequent failures will follow the same routine until a pass condition is secured.

3.9 CLEAN-UP AND DISPOSAL

3.9.1 Disposal of Material

Dispose of contaminated bagged waste materials removed during this remediation as general construction debris. Follow all applicable local, State, and Federal requirements for the disposal of this material.

3.9.2 Material Packaging

Place waste, as waste is removed, into a disposal container promptly. Disposal containers shall consist of at a minimum, two layers of clear 6 mil polyethylene bags. Tape bags in a gooseneck fashion to form an airtight seal and label appropriately. Bag waste from vacuums equipped with HEPA filters in 6 mil polyethylene bags.

3.9.3 Building Exit (Waste Disposal)

HEPA vacuum and damp wipe bags of contaminated waste material prior to removal from the building.

3.9.4 Hazardous Material

Should the Contractor encounter any hazardous materials, notify the Contracting Officer immediately for direction.

3.10 Appendices

Appendix A - Microbial Assessment Visual Field Report Form
Appendix B - Sample Mold Remediation Clearance Criteria For Buildings Housing Sensitive Populations

Appendix A

Microbial Assessment Visual Field Report Form

TO DOWNLOAD THIS FORM, SEE UFGS GRAPHICS
Go to http://www.wbdg.org/ccb/NAVGRAPH/graphtoc.pdf.

Appendix B

Sample Mold Remediation Clearance Criteria
For Buildings Housing Sensitive Populations

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PART 1 – PROPOSAL FORMS AND DOCUMENTS (BY OTHERS)

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SECTION 01 11 00

SUMMARY OF WORK
08/11

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.

ASTM INTERNATIONAL (ASTM)

ASTM E2114	(2008) Standard Terminology for Sustainability Relative to the Performance of Buildings

GREEN BUILDING INITIATIVE (GBI)

GBI/ANSI 01	(2010 Green Building Assessment Protocol for Commercial Buildings

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

Energy Star	(1992; R 2006) Energy Star Energy Efficiency Labeling System (FEMP)

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

1.2 DEFINITIONS

Definitions pertaining to sustainable development are as defined in ASTM E2114, , and as specified.

a. "Environmentally preferable products" have a lesser or reduced effect on the environment in comparison to conventional products and services. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product.

b. "Indoor environmental quality" is the physical characteristics of the building interior that impact occupants, including air quality, illumination, acoustics, occupant control, thermal comfort, daylighting, and views.

c. "Operational performance" is the functional behavior of the building as a whole or of the building components.

d. "Sustainability" is the balance of environmental, economic, and societal considerations.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Energy Performance Rating

1.4 WORK COVERED BY CONTRACT DOCUMENTS

1.4.1 Project Description

The work includes products and material, including installation, as indicated in the work scope and project description of each task order and incidental related work.

1.4.2 Location

The work shall be located at the as indicated in each task order, approximately as indicated. The exact location will be shown by the Contracting Officer.

1.5 PROJECT ENVIRONMENTAL GOALS

Contractor shall distribute copies of the Environmental Goals to each subcontractor and the Contracting Officer. The overall goal for design, construction, and operation is to produce a building that meets the functional program needs and incorporates the principles of sustainability. Specifically:

a. Preserve and restore the site ecosystem and biodiversity; avoid site degradation and erosion. Minimize offsite environmental impact.

b. Use the minimum amount of energy, water, and materials feasible to meet the design intent. Select energy and water efficient equipment and strategies.

c. Use environmentally preferable products and decrease toxicity level of materials used.

d. Use renewable energy and material resources.

e. Optimize operational performance (through commissioning efforts) in order to ensure energy efficient equipment operates as intended. Consider the durability, maintainability, and flexibility of building systems.

f. Manage construction site and storage of materials to ensure no negative impact on the indoor environmental quality of the building.

g. Reduce construction waste through reuse, recycling, and supplier take-back.

1.5.1 Independent Verification

1.5.1.1 US Green Building Council (USGBC) - LEED(tm) Rating System

Provide completed project in compliance with USGBC LEED-NC(tm) v2.2 or the latest LEED certification requirements at the time of (LEED NC), level silver or as indicated in each task order.

1.5.1.2 Green Globes US

Provide completed project in compliance with GBI/ANSI 01 US level Two Globes or as indicated in each task order.

1.5.1.3 EPA Energy Performance Rating

Provide work consistent with drawings in order to meet Energy Star in accordance with design.

1.6 OCCUPANCY OF PREMISES

Building(s) may be occupied during performance of work under this Contract. Occupancy notifications will be posted in a prominent location in the work area.

Before work is started, the Contractor shall arrange with the Contracting Officer a sequence of procedure, means of access, space for storage of materials and equipment, and use of approaches, corridors, and stairways.

1.7 EXISTING WORK

In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements":

a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

1.8 LOCATION OF UNDERGROUND UTILITIES

Obtain digging permits prior to start of excavation by contacting the Contracting Officer 15 calendar days in advance. Scan the construction site with Ground Penetrating Radar and electromagnetic or sonic equipment, and mark the surface of the ground, pier deck or paved surface where existing underground utilities or utilities encased in pier structures are discovered. Verify the elevations of existing piping, utilities,and any type of underground or encased obstruction not indicated to be specified or removed but indicated or discovered during scanning in locations to be traversed by piping, ducts, and other work to be conducted or installed. Verify elevations before installing new work closer than nearest manhole or other structure at which an adjustment in grade can be made.

1.8.1 Notification Prior to Excavation

Notify the Contracting Officer at least 48 hours prior to starting excavation work.

1.9 GOVERNMENT-FURNISHED MATERIAL AND EQUIPMENT

Pursuant to Contract Clause "FAR 52.245-2, Government Property (Fixed Price Contracts)" , the Government will furnish the following materials and equipment for installation by the Contractor as indicated in each task order.

1.9.1 Delivery Schedule

Notify the Contracting Officer in writing at least 60 calendar days in advance of the date on which the materials and equipment are required. Pick up materials and equipment no later than 30 calendar days after such date. When materials and equipment are not picked up by the 30th day, the Contractor will be charged for storage at the rate specified in each task order.

1.9.2 Delivery Location

The materials and equipment are located at a location indicated in each task order .

1.10 Navy and Marine Corps (NMCI) Coordination Requirements

1.10.1 NMCI Contractor Access

The NMCI Contractor must be allowed access to the facility towards the end of construction (finishes 90 percent complete, rough-in 100 percent complete, Inside Plant (ISP)/Outside Plant (OSP) infrastructure in place) to provide equipment in the telecommunications rooms and make final connections. Coordinate efforts with the NMCI contractor to facilitate joint use of building spaces during the final phases of construction. After the Contracting Officer has facilitated coordination meetings between the two contractors, the construction contractor must, within one week, incorporate the effort of additional contractor coordination into construction schedule to demonstrate plan for maintaining the contract duration.

1.11 SALVAGE MATERIAL AND EQUIPMENT

Items designated by the Contracting Officer to be salvaged shall remain the property of the Government.

The salvaged property shall be segregated, itemized, delivered, and off-loaded at the Government designated storage area located within the contract area or where indicated in each task order.

Contractor shall maintain property control records for material or equipment designated as salvage. Contractor's system of property control may be used if approved by the Contracting Officer. Contractor shall be responsible for storage and protection of salvaged materials and equipment

until disposition by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00.05 20

WORK RESTRICTIONS FOR DESIGN-BUILD
09/15

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List Of Contact Personnel; G

Visit Request for Pearl Harbor Naval Shipyard Form (PHNSY 14ND-SYD-5512/28); G

Completed Special Access Determination (NAVSEA 5510/15); G

Pier Parking Authorization; G

Government Guard Services; G

Contractor Regulations; G

Purchase Orders; G

List of Contact Personnel; G

Personnel List; G

Vehicle List; G

Statement of Acknowledgement Form SF 1413; G

1.2 SPECIAL SCHEDULING REQUIREMENTS

a. Permission to interrupt any Activity roads, railroads, or utility service must be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.

b. NMCI Contractor Access: The NMCI Contractor must be allowed access to the facility towards the end of construction (finishes 90 percent complete, rough-in 100 percent complete, Inside Plant (ISP)/Outside Plant (OSP) infrastructure in place) to provide equipment in the telecommunications rooms and make final connections. The Contractor will be required to coordinate their efforts with the NMCI contractor to facilitate joint use of building spaces during the final phases of construction and work the coordination effort into the construction

schedule. Requirements for NMCI are specified in Part 4, D50 ELECTRICAL and G40 SITE ELECTRICAL UTILITIES.

1.3 CONTRACTOR ACCESS AND USE OF PREMISES

1.3.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. Ingress and egress of Contractor vehicles at MCBH Kaneohe Bay is limited to the H-3 gate. To minimize traffic congestion, delivery of materials shall be outside of peak traffic hours (6:30 to 8:00 a.m. and 3:30 to 5:00 p.m.) unless otherwise approved by the Contracting Officer. Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. Mark Contractor equipment for identification.

1.3.1.1 Subcontractors and Personnel Contacts

Provide a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

1.3.1.2 Identification Badges and Installation Access

Application for and use of badges will be as directed. Obtain access to the installation by participating in the Navy Commercial Access Control System (NCACS) or by obtaining passes each day from the Base Pass and Identification Office. Costs for obtaining passes through the NCACS are the responsibility of the Contractor. One-day passes, issued through the Base Pass and Identification Office will be furnished without charge. Furnish a completed EMPLOYMENT ELIGIBILITY VERIFICATION (DHS FORM I-9) form for all personnel requesting badges. This form is available at http://www.uscis.gov/portal/site/uscis by searching or selecting Employment Verification (Form I-9) . Immediately report instances of lost or stolen badges to the Contracting Officer.

a. NCACS Program: NCACS is a voluntary program in which Contractor personnel who enroll, and are approved, are subsequently granted access to the installation for a period up to one year, or the length of the contract, whichever is less, and are not required to obtain a new pass from the Base Pass and Identification Office for each visit. The Government performs background screening and credentialing. Throughout the year the Contractor employee must continue to meet background screening standards. Periodic background screenings are conducted to verify continued NCACS participation and installation access privileges. Under the NCACS program, no commercial vehicle inspection is required, other than for Random Anti-Terrorism Measures (RAM) or in the case of an elevation of Force Protection Conditions (FPCON). Information on costs and requirements to participate and enroll in NCACS is available at http://www.rapidgate.com/vendors/how-to-enroll or by calling 1-877-727-4342.

b. One-Day Passes: Participation in the NCACS is not mandatory, and if the Contractor chooses not to participate, the Contractor's personnel will have to obtain daily passes, be subject to daily mandatory vehicle inspection, and will have limited access to the installation. The Government will not be responsible for any cost or lost time associated with obtaining daily passes or added vehicle inspections incurred by non-participants in the NCACS.

1.3.1.3 FISC Pearl Harbor Safety/Security Policy

Non-FISC personnel requiring access to FISC property must check in at the Fuel Department, FISC Operations Division, B1757 1st deck, at the beginning and end of each work day. Keys to Fuel Facilities will be issued daily between the hours of 6:30 a.m. and 4:00 p.m. Keys must be returned by 7:00 p.m. the same day. An after-hours drop box is located outside B1757.

At the end of each workday, update the check-in board in the FISC Operations Division and provide information as follows for the next workday:

a. Contract name or number

b. Name of person responsible for work crew(s)

c. Emergency phone numbers

d. Number of workers in crew

e. Location of work

f. Type of work to be conducted

g. FISC support required:

(1) Transportation

(2) Draining of pipe

(3) Outages

(4) Elevator use

(5) Other

Route hot work permits to the FISC Fuel Department (Code 701) for approval. Following approval, submit permit to the Federal Fire Department (FFD). After approval by the FFD, submit a copy of the permit and the Marine Chemist Gas Free Certificate to the Fuels Operations Division for record.

1.3.1.4 No Smoking Policy

Smoking is prohibited within and outside of all buildings on installation, except in designated smoking areas. This applies to existing buildings, buildings under construction and buildings under renovation. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines. The Contracting Officer will identify designated smoking areas.

1.3.2 Entry to Radiologically Controlled Areas

Contractor personnel must not, under any circumstances, enter a radiologically controlled area or cross any posted radiological boundary. This paragraph applies to all phases of contract work. Radiation areas are posted with signs consistent with OSHA requirements. Ensure that employees are familiar with the radiation signs and symbols. All personnel entering the shipyard for the first time are required to receive radiological indoctrination training.

Should contract workers encounter radiological postings or boundaries which appear to limit their ability to access or carry out their intended work, they must notify their contract administrator for resolution of the problem.

1.3.3 Working Hours

Regular working hours must consist of an 8 1/2 hour period established by the Contracting Officer, between 7 a.m. and 3:30 p.m., Monday through Friday, , excluding Government holidays.

1.3.4 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 21 calendar days prior to such work to allow arrangements to be made by the Government, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. During periods of darkness, the different parts of the work must be lighted in a manner approved by the Contracting Officer.

1.3.5 Exclusionary Periods

No work is to be performed during Basewide annual security exercises for 2 days each year , inclusive, without prior written approval of the Contracting Officer. Such delays must be incorporated into the Contractor's construction schedule and will be at no additional cost or time to the Government.

1.3.6 Occupied and Existing Buildings

The Contractor will be working in an existing building and around existing buildings which are occupied. Do not enter the building without prior approval of the Contracting Officer.

The existing buildings and their contents must be kept secure at all times. Provide temporary closures as required to maintain security as directed by the Contracting Officer.

Provide dust covers or protective enclosures to protect existing work that remains and Government material located in the building during the construction period.

Relocate movable furniture as required to perform the work, protect the furniture, and replace the furniture in its original locations upon completion of the work. Leave attached equipment in place, and protect them against damage, or temporarily disconnect, relocate, protect, and reinstall them at the completion of the work.

1.3.7 Utility Cutovers and Interruptions

a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph WORK OUTSIDE REGULAR HOURS.

b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.

c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, compressed air, and are considered utility cutovers pursuant to the paragraph WORK OUTSIDE REGULAR HOURS. Such interruptions are further limited to approved hours. This time limit includes time for deactivation and reactivation.

d. Operation of Station Utilities: The Contractor must not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor must notify the Contracting Officer giving reasonable advance notice when such operation is required.

1.3.7.1 Location of Underground Utilities

Obtain digging permits prior to start of excavation by contacting the Contracting Officer 15 calendar days in advance. Scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground or paved surface where existing underground utilities or utilities encased in pier structures are discovered. Verify the elevations of existing piping, utilities, and any type of underground or encased obstruction not indicated to be specified or removed but indicated or discovered during scanning in locations to be traversed by piping, ducts, and other work to be conducted or installed.

Notification Prior to Excavation: Notify the Contracting Officer at least 21 days prior to starting excavation work.

1.3.8 Shipyard Area Work Clearance Request

Coordinate excavation and electrical work, including testing and trouble shooting of circuits, within the Pearl Harbor Shipyard with Public Works Center Code 600 and NAVSHIPYD Code 308 via the Contracting Officer. Provide the following:

a. Contract title and number

b. Specific location of work

c. Reason for work

d. Duration of work

1.3.9 Shipyard Hazardous Areas

Do not enter into work areas where Shipyard personnel are using protective equipment such as respirator and masks or marked boundary areas without prior approval.

1.3.10 Restrictions on Use of Yellow, Orange-Yellow, Red, and Magenta Materials

Contractor must refrain from use of yellow or orange-yellow materials for the following purposes: sheeting, tarpaulins, polyethylene bottles or other containers, tapes, bags, banding of identification marks on tools, boundary markers such as ribbons. Contractor generated yellow waste materials such as torn foul weather gear must be disposed of by the Contractor off-yard. Shipyard dumpsters and trash cans must not be used for disposal of Contractor generated yellow waste materials. Yellow colored items such as described above are of specific significance within the shipyard and are subject to strict controls.

The use of yellow, yellow-orange, red and magenta materials for the following purposes is prohibited: sheeting, tarpaulins, polyethylene bottles or other containers, tapes, bags, banding of identification marks on tools, and boundary markers such as ribbons. Obtain Contracting Officer's prior approval for use of such colored materials for other purposes, such as buried vapor barrier membranes.

1.4 SECURITY REQUIREMENTS

1.4.1 Employment Restrictions for NAVFAC Pacific

The Contractor must not employ for any work required by this contract, any person who is a nonimmigrant as described in section 101(a)(15)(H)(ii) of the Immigration and Nationality Act (8 U.S.C. 1101(a)(15)(H)(ii), an alien having a residence in a foreign country which he has no intention of abandoning and who is coming to the United States to perform temporary services or labor.

1.4.1.1 Personnel List

Submit for approval, at least 15 days prior to the desired date of entry, an original alphabetical list of personnel who require entry into Government property to perform work on the project. Furnish for each person:

a. Name

b. Date and place of birth

c. Citizenship

d. Home address

e. Social security number

f. Current pass expiration date

g. Naturalization number

h. Passport number, place of issue, and expiration date

1.4.1.2 Citizenship Requirements

Aliens are not allowed on the project site. Work under this contract is restricted to U.S. citizens.

1.4.1.3 Documents Acceptable for Proof of Citizenship

a. Birth registration card

b. Certificate of live birth, birth certificate

c. Certificate of Naturalization

d. Certificate of registration

e. DD-214 (Must Cite Birthplace)

f. DD Form 4 (Contract for Enlistment and Must Cite Birthplace)

g. DD 1966 (Application for Enlistment)

h. Military discharge papers (must cite birthplace)

i. Delayed birth certificate

j. Hawaii certificate of foreign birth

k. Hospital birth certificate

l. Marriage license certificate

m. Merchant marine certificate

n. Military officer ID card

o. Notification of birth registration

p. State of Hawaii ID card

q. USA passport

r. Verbal inquiry with State of Hawaii Vital Statistics Office

1.4.1.4 Vehicle List

Submit an original list of vehicles to be utilized at the work site with the following information for each vehicle:

a. Make

b. Year

c. Model

d. License number

e. Registered owner

f. Current NAVBASE Pearl Harbor pass expiration date.

1.4.1.5 Passes

For Bases other than MCBH Kaneohe, submit request for personnel and vehicle passes together. Include the Certificate of Insurance for Contractor and

Subcontractor(s) and the Statement of Acknowledgement Form SF 1413 with the submittal. Passes will normally be issued within 21 days.

For MCBH Kaneohe projects, obtain a blank vehicle pass from the ROICC Kaneohe office, Building 566, and complete and submit it to the Contracting Officer for processing. Include with the submittal, a Certificate of Insurance for Contractor and Subcontractor(s), the Statement of Acknowledgement Form SF 1413 (for Subcontractors only), a Vehicle List, and a Personnel List with Citizenship. Passes will normally be issued within 21 calendar days.

1.4.1.6 Control

Maintain strict accountability over passes. Immediately report to the source of issue, passes missing or lost and the circumstances. If the Contractor has another active contract or one commencing immediately, employees' names may be transferred from one contract to the other. Final payment will not be effected until employees are transferred to another contract or the records are cleared. Furnish a signed letter, countersigned by the source of issue, stating that passes have been turned in.

1.5 EXTRAORDINARY SECURITY REQUIREMENTS FOR PEARL HARBOR

1.5.1 Shipyard CIA and Sensitive Areas

Six weeks prior to entry into the CIA, submit a visit request for Pearl Harbor Naval Shipyard form (PHNSY 14ND-SYD-5512/28) to the Contracting Officer. The Visit Request must include certification of U.S. citizenship. Entry into the CIA for those listed on the Visit Request may be authorized under one of the following conditions:

a. Contractors having a DOD Facility Security Clearance and whose employees have a DOD security clearance may be badged for immediate unescorted access into the CIA.

b. Employees and representatives having current Shipyard ID badges authorizing CIA access will be permitted entry into the CIA.

c. Employees not holding a current DOD security clearance or current CIA access badge must establish suitability and eligibility based on a Local Record Check (LRC) prior to being badged for unescorted CIA access. A LRC may take up to 3 weeks to process. Provide a Completed Special Access Determination (NAVSEA 5510/15) (Apr 90) for each employee.

d. For situations other than the above, employees or representatives requiring CIA access may be issued an "Escort Required" ("ER") pass for CIA access under the escort of a cleared individual employed by the activity. Processing of "ER" passes may take up to 5 days.

(1) The initial submittal of Visit Request forms need not be all inclusive. It may be expanded to meet essential requirements of the Contractor. Each individual added to the list, however, is subject to the same pre-entry screening requirements as outlined above.

(2) Shipyard ID badges will be issued by the Shipyard Pass and Identification Office (Pass and ID Office) located in Building 207

at Eighth Street and Avenue "E."

1.5.2 Vehicle Regulations in the Shipyard CIA

No vehicle will be permitted access to a work site in the CIA without a valid Naval Base vehicle pass and a Shipyard vehicle pass. Naval Base vehicle passes are issued by the Base Security Office located in Building 3455 outside the Nimitz Gate. The Shipyard vehicle passes are issued by the Shipyard Pass and ID Office. Shipyard vehicle passes will not be issued unless a Naval Base vehicle pass has been obtained and proof of vehicle registration to the Contractor's company has been presented to Shipyard Pass and ID. Vehicles are required to conform to Shipyard traffic regulations. The speed limit is 15 mph in the CIA. Outside the CIA, the speed limit is as posted or marked.

1.5.2.1 Shipyard Vehicle Pass

Only those Contractor vehicles meeting the following criteria will be allowed to enter the CIA with the Shipyard vehicle pass:

a. Vehicles must clearly display an authorized company sign or logo.

b. Vehicles must be company or commercial vehicles used to transport heavy equipment or material to the job site or to conduct bonafide and required inspections and surveillance at the job site. Privately-owned vehicles will not be used to transport employees to the job site and will not be allowed in the CIA.

1.5.2.2 Commercial Vehicles

Vehicle passes will be issued to each commercial vehicle that is required for the job, authorizing entry and parking within the CIA. Every vehicle entering the CIA will display the pass on the dashboard or visor (facing outward). The pass will be visible at all times while in the CIA. Parking is limited to those areas that are specifically identified on the pass. If additional passes are required, present adequate justification to the Pass and ID Office via the Contracting Officer.

1.5.2.3 Gates

Vehicles must enter and exit from one of the two 24-hour gates located on Avenue "C" or on Fifth Street.

1.5.3 Parking

Prohibited on any piers and dry dock/waterfront areas. Do not park on or block the marked fire lanes at any time. An exception may be made for vehicles which are part of the equipment needed to do the required work and are attached or connected to the pier or ship; for example, a truck which uses a mounted generator or a vehicle with built-in equipment. For the CIA area, submit a written request for pier parking authorization with justification to the Shipyard Security Officer (Code 1125.2) via the Contracting Office at least 2 weeks prior to the date parking space is required. To obtain parking permits, limited to five, for Bravo pier side parking, submit a written request with justification to the ROICC. Permits do not include heavy equipment, loading/unloading operations or vehicles with Federal Fire Department (FFD) permission for support of immediate work activities in the fire lane. Permits are issued by the Port Operations Officer. Include with request the license number of the vehicle(s), make,

model, year, and size of the vehicle(s) (pickup truck, crane, or forklift), parking location, and purpose and duration.Harbor Operations will monitor dock operations and will have vehicle violators ticketed/towed. For permission to stage construction equipment in or protruding into the Bravo pier fire lanes, contact the FFD, c/o Fire Prevention Chief, pager 473-5199.

1.5.3.1 Parking Locations

Parking for privately-owned vehicles is available in lots "A" and "D" on Avenue "D," located between South Avenue and Eighth Street, and in lot "C" on Sixth Street and Central Avenue.

1.5.4 Vehicle Searches

Vehicles are subject to search while entering, remaining in, or leaving the Shipyard or Naval Base areas. Government material being transported out of the CIA must be covered by a Property Pass (OP-7), issued and signed by the Contracting Officer. Material found without a Property Pass will be confiscated and a police offense report issued.

1.5.5 Authorization of Entry

Coordinate entry into shop/office/ship spaces with respective Shop Superintendent/Office Head/Ship's Commanding Officer via the Contracting Officer.

1.5.6 Escort

For entrance to and work inside any building inside the CIA, contact the cognizant Shipyard code for escort services in the affected area.

1.5.7 Government Guard Services

The Shipyard Security Officer (SSO) will provide guard services on a reimbursable basis for work on CIA perimeter fence job sites. Notify and obtain approval from the SSO via the Contracting Office at least 48 hours prior to the time guard services will be required. Submit in writing the purpose and number of hours guard services will be required. Any work on the CIA fence must be completed by the end of the work day or the openings resulting from that work must be closed to prevent unauthorized access.

1.5.8 Areas Not Covered by Contract

Contractor personnel will not be permitted to enter Shipyard buildings, spaces, and areas not covered by this contract except on prior approval of the Shipyard department/office/shop having jurisdiction of the areas. Coordinate action with the Contracting Officer to obtain such entry approval.

1.5.9 Access to Unclassified Information

Access to unclassified U.S. Navy shipbuilding, conversion, or repair technology and related technical information manuals, documents, drawings, plans, specifications, and other unclassified information is restricted to official need-to-know basis, designated by physical markings to show the appropriate control designations. Handle, control, and safeguard to prevent oral, visual, and documentary disclosure to the public, to foreign sources, and to personnel not having an official need-to-know. Return this information to the Pearl Harbor Naval Shipyard upon completion of

contracted work, except when specific retention authorization is granted by the Contracting Officer.

1.5.10 Photographs

Photography is prohibited in the Pearl Harbor Naval Shipyard. When operationally required, submit a written request containing specific justification and details to the Video Production Center (Code 103) via review by the Security Officer prior to release.

1.5.11 Contractor Regulations

Comply with the following conditions:

a. Submit a Visit Request (VR) and Special Access Determination (SAD) for each person listed to the Security Officer (Code 1125.2) via the Contracting Officer at least 6 weeks prior to the start date.

b. Employees and representatives requiring access are U.S. citizens or U.S. nationals.

c. Under no circumstances will personnel be allowed to hand carry their own visit request.

d. Employees must provide documented proof of U.S. citizenship to the Pass and ID Office prior to being issued a Shipyard badge.

e. Employees must be available for interviews upon request by the Shipyard Personnel Security Specialist.

f. Employees' representatives must attend a 15-minute orientation on the safety, security, and radiological protection aspects of industrial operations within the Shipyard. The briefing, in the form of a video tape presentation, will be given at the Pass and ID Office in groups of 10, prior to the issuance of Shipyard badges or passes. Special arrangements for larger groups can be arranged on request.

g. Employees must wear and display the Shipyard badge in the chest area at all times while entering, remaining in, and exiting Shipyard spaces and each badge must be used only by the specific individual named on the badge.

h. Vehicles in Shipyard areas must display a valid Naval Base vehicle pass and must have company's name on both sides of any vehicle that enters the CIA.

i. Maintain strict accountability over identification badges and passes issued by the Pass and ID office. Immediately report to the Pass and ID Office, any badges/passes missing or lost and the circumstances. Return badges/passes to the Contracting Officer immediately upon termination of any employee, expiration, completion of contract, or when no longer required. The Contracting Officer will ensure that all badges/passes are returned and forwarded to the Shipyard Pass and ID Office (Code 1125.2).

j. Restrict hours of work to 7:00 a.m. - 3:30 p.m. Monday through Friday, work days only. When operational needs require scheduling of work after 3:30 p.m. (Monday through Friday) or on weekends and holidays, provide written notification at least 2 weeks in advance to the

Contracting Officer who will obtain approval from the respective Shipyard departments, offices, and shops. Such notifications will include specific dates, hours of work, location of work, type of work to be performed, contract number and project title. The Contracting Officer will provide a copy of the notification to the Security Officer along with written notification that work, as scheduled, has been approved by the respective department, office, or shop concerned.

k. Restrict employees/representatives to the work site and control travel directly to and from the work site.

l. Ensure that yellow plastic material is not used for warning signs, covering materials, etc.

m. Restore all traffic/parking/security signs and markings, including space numbers, designations, and lines, to their original form if such signs/markings are defaced or deleted during construction/repair.

n. Be responsible for control and security of Contractor-owned equipment and materials at the work site. Report immediately, missing/lost/stolen property to the Naval Base Police Department (phone 474-1237) as each case occurs.

o. Ensure that no material is stacked within 10 feet of the CIA perimeter. Remove from the work site, or secure ladders or other such equipment which could be used to climb the CIA perimeter fence. Ensure that no vehicles are parked within 10 feet of the CIA perimeter.

p. Provide written notification to the Commander, Pearl Harbor Naval Shipyard via the Contracting Officer 2 weeks prior to actual start of work to allow for notification of the appropriate Shipyard departments, offices, and shops of the impact resulting from the contract work. Such notifications will include specific details such as work schedules (including actual start date for Shipyard entry) and impact.

q. Ensure that no opening in the roof/walls/windows/fence of the building exist at the end of the work day and do not exist where penetration is possible during non-working hours. If the building cannot be secured at the end of the work day, coordinate action with the Contracting Office to notify the cognizant code to arrange for a security watch by their personnel.

r. Seventy-two hours prior to making any penetrations (such as tunneling under, cutting through a fence or building) in a restricted area, contact Code 1125.2 to make arrangements for a security guard or other measures required to meet all security requirements. Cost of security guard will be charged to the Contractor.

1.5.12 Other Sensitive Areas

1.5.12.1 Extraordinary Security Requirements

The Contract Clause entitled "Identification of Employees" and the following apply:

a. Vehicle searches. All construction vehicles will be searched by the Marine sentry.

b. Photographs. Photographs are prohibited in and around the building

unless a written request containing specific justification and details is approved by the security officer via the Contracting Officer. Four days' advance notice is required. Photographs, when approved, shall be taken in the presence of an activity escort.

c. Personnel restrictions. Due to sensitivity of building operations, the following apply:

(1) Restrict personnel to the designated work site.

(2) Contractor's movements within the building will be restricted. Contractor personnel will be escorted to and from designated work areas. Contractor personnel are not permitted outside of designated work areas without being escorted by authorized personnel. Submit requests for entry into the building 4 days in advance with information required by paragraph PERSONNEL LIST for submission to the "Division Project Officer" through the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 20 00.05 20

PRICE AND PAYMENT PROCEDURES FOR DESIGN-BUILD
01/12

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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP-1110-1-8	(2009) Construction Equipment Ownership and Operating Expense Schedule

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Earned Value Report; G

1.3 EARNED VALUE REPORT

1.3.1 Data Required

This contract requires the use of a cost-loaded Network Analysis Schedule (NAS). The information required for the Schedule of Prices will be entered as an integral part of the Network Analysis Schedule. Within 15 calendar days of notice of award, prepare and deliver to the Contracting Officer an Earned Value Report (construction contract) as directed by the Contracting Officer. Provide a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, and extended prices. Costs shall be summarized and totals provided for each construction category.

1.3.2 Schedule Instructions

Payments will not be made until the Earned Value Report from cost-loaded NAS has been submitted to and accepted by the Contracting Officer. For design phase progress payment(s), the Schedule of Prices or Earned Value Report from the Cost Loaded CPM shall include detailed design activities and general (summarized) approach for the construction phase(s) of the project. The Schedule of Prices or Earned Value Report shall be fully developed with detailed construction line items as design progresses. The complete design and construction Schedule of Prices or Earned Value Report shall be submitted and accepted prior to starting construction work.

For Fast-Tracked or Critical Path Submittals of construction projects, the Earned Value Report shall include detailed design and construction line

items for each fast-tracked/ critical path phase(s), submitted to and accepted by the Contracting Officer during the Post Award Kickoff Meetings and confirmed prior to starting construction work in that phase. Additionally, the Earned Value Report shall be separated as follows:

a. Primary Facility/s Cost Breakdown:

Defined as work on the primary facility/s out to the 5 foot line. Work out to the 5 foot line shall include construction encompassed within a theoretical line 5 foot from the face of exterior walls and shall include attendant construction, such as pad mounted HVAC equipment, that may extend beyond the 5 foot line.

Provide a cost breakout for all Primary Facility features that support Low Impact Development (LID), such as vegetated roof and rainwater harvesting features. The sum of the Primary Facility Cost above - a. and these Primary Facility LID sub-items - (1) shall equal the total Primary Facility cost. Provide a subtotal cost of all Primary Facility LID sub-items on the Earned Value Report at design complete and project closeout.

b. Supporting Facilities Cost Breakdown:

Defined as site work, including incidental work, outside the 5 foot line.

Provide a cost breakout for all Supporting Facilities features that support LID, such as bioswales, permeable paving, infiltration basins, tree box filters, etc.. The sum of the Supporting Facilities Cost above - b. and these Supporting Facilities LID sub-items - (1) shall equal the total Supporting Facilities cost. Provide a subtotal cost of all Supporting Facilities LID sub-items on the Earned Value Report at design complete and project closeout.

1.3.3 Real Property Assets

Provide the Draft and Interim DD Form 1354, Transfer and Acceptance of Military Real Property filled in with the appropriate Real Property Unique Identifiers (RPUID) and related construction Category Codes. Provide the Draft DD Form 1354 that uses the appropriate division of the RPUIDs/ Category Codes to represent the designed real property assets that apply to this contract and include all associated cost. The Contractor shall meet with the Contracting Officer and the Real Property Accounting Officer during the Post Award Kickoff Meeting and the Project Closeout Meetings to modify and include any necessary changes to the DD Form 1354. The Contractor shall provide the Interim DD Form 1354 that uses the appropriate division of the RPUIDs/ Category Codes to represent the final constructed facility and include all associated cost. Coordinate the Contractor's Price and Payment structure with the structure of the RPUIDs / Category Codes.

Divide detailed asset breakdown into the RPUIDs and related construction Category Codes and populate associated costs which represent all aspects of the work. Where assets diverge into multiple RPUID/ Category Codes, divide the asset and provide the proportion of the assets in each RPUID/ Category Code. Assets and related RPUID/ Category Codes may be modified by the Contracting Officer as necessary during the course of the work. Coordinate identification and proportion of these assets with the Government Real Property Accounting Officer.

Cost data accumulated under this section are required in the preparation of

DD Form 1354. Coordinate with section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES in paragraph titled "DD Form 1354".

1.3.4 Schedule Requirements for HVAC TAB

The field work requirements of TAB work required by RFP Part 4 D30, HVAC shall be broken down in the Earned Value Report from the cost-loaded NAS by separate line items which reflect measurable deliverables. Specific payment percentages for each line item shall be determined on a case by case basis for each contract. The line items shall be as follows:

a. Approval of Design Review Report: The TABS Agency is required to conduct a review of the project plans and specifications to identify any feature, or the lack thereof, that would preclude successful testing and balancing of the project HVAC systems. The resulting findings shall be submitted to the Government to allow correction of the design. The progress payment shall be issued after review and approval of the report.

b. Approval of the pre-field engineering report: The TABS Agency submits a report which outlines the scope of field work. The report shall contain details of what systems will be tested, procedures to be used, sample report forms for reporting test results and a quality control checklist of work items that must be completed before TABS field work commences.

c. Season I field work: Incremental payments are issued as the TABS field work progresses. The TABS Agency mobilizes to the project site and executes the field work as outlined in the pre-field engineering report. The HVAC water and air systems are balanced and operational data shall be collected for one seasonal condition (either summer or winter depending on project timing).

d. Approval of Season I report: On completion of the Season I field work, the data is compiled into a report and submitted to the Government. The report is reviewed, and approved, after ensuring compliance with the pre-field engineering report scope of work.

e. Completion of Season I field QA check: Contract QC and Government representatives meet the TABS Agency at the jobsite to retest portions of the systems reported in the Season I report. The purpose of these tests are to validate the accuracy and completeness of the previously submitted Season I report.

f. Approval of Season II report: The TABS Agency completes all Season II field work, which is normally comprised mainly of taking heat transfer temperature readings, in the season opposite of that under which Season I performance data was compiled. This data shall be compiled into a report and submitted to the Government. On completion of submittal review to ensure compliance with the pre-field engineering report scope, progress payment is issued. Progress payment is less than that issued for the Season I report since most of the water and air balancing work effort is completed under Season I.

1.3.5 Schedule Requirements for LEED Certification

Submittals to the U.S. Department of Energy's Federal Energy Management Program, High Performance Federal Buildings Database and to USGBC for LEED certification as required in 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES shall be included as activities in the NAS. A separate line item equal to

0.5 percent of the contract/task order value and identified as - LEED Certification, shall be included in the contractor's Earned Value Report from the cost-loaded NAS. The unit of measure for this line item shall be lump sum without any payment made until the specified level of LEED certification is obtained from USGBC and the Certification documentation is provided to the Contracting Officer in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES.

1.4 CONTRACT MODIFICATIONS

In conjunction with the Contract Clause "DFARS 252.236-7000, Modification Proposals-Price Breakdown," and where actual ownership and operating costs of construction equipment cannot be determined from Contractor accounting records, equipment use rates shall be based upon the applicable provisions of the EP-1110-1-8.

1.5 CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT

1.5.1 Content of Invoice

Requests for payment will be processed in accordance with the Contract. Clause FAR 52.232-27, Prompt Payment Construction Contracts and FAR 52.232-5, Payments Under Fixed-Price Construction Contracts. The Requests for payment shall include the documents listed below:

a. The Contractor's invoice, on NAVFAC Form 7300/30 furnished by the Government, showing in summary form, the basis for arriving at the amount of the invoice. Form 7300/30 shall include certification by Quality Control (QC) Manager as required by the contract.

b. The Earned Value Report from the cost-loaded NAS, showing in detail: the estimated cost, percentage of completion, and value of completed performance for each of the construction categories stated in this contract.

c. Updated Project Schedule and reports required by the contract

d. Contractor Safety Self Evaluation Checklist

e. Other supporting documents as requested

f. Updated copy of submittal register.

g. Invoices not completed in accordance with contract requirements will be returned to the Contractor for correction of the deficiencies.

h. Subcontractor and supplier payment certification.

i. Materials on Site.

h. Monthly Work-hour report

i. Solid Waste Disposal Report

1.5.2 Submission of Invoices

If NFAS Clause 5252.232-9301 is included in the contract, the documents

listed in paragraph titled " Content of Invoice" above shall be provided in their entirety as an attachment in Wide Area Work Flow (WAWF) for each invoice submitted. The maximum size of each WAWF attachment is two megabytes, but there are no limits on the number of attachments. If a document cannot be attached in WAWF due to system or size restriction it shall be provided as instructed by the Contracting Officer. All other paper invoices shall be forwarded with specific marking on the envelope. This marking shall be in the front lower left hand corner, in large letters, "INVOICES - ENCLOSED."

1.5.3 Final Invoice

a. A final invoice shall be accompanied by the certification required by DFARS 252.247.7023 TRANSPORTATION OF SUPPLIES BY SEA, and the Contractor's Final Release. If the Contractor is incorporated, the Final Release shall contain the corporate seal. An officer of the corporation shall sign and the corporate secretary shall certify the Final Release.

b. For final invoices being submitted via WAWF, the original Contractor's Final Release Form and required certification of Transportation of Supplies by Sea must be provided directly to the respective Contracting Officer prior to submission of the final invoice. Once receipt of the original Final Release Form and required certification of Transportation of Supplies by Sea has been confirmed by the Contracting Officer, the Contractor shall then submit final invoice and attach a copy of the Final Release Form and required certification of Transportation of Supplies by Sea in WAWF.

c. Final invoices not accompanied by the Contractor's Final Release and required certification of Transportation of Supplies by Sea will be considered incomplete and will be returned to the Contractor.

1.6 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests by the Contractor which comply with the requirements of this section, and will be subject to reduction for overpayments or increase for underpayments made on previous payments to the Contractor.

1.6.1 Obligation of Government Payments

The obligation of the Government to make payments required under the provisions of this contract will, at the discretion of the Contracting Officer, be subject to reductions and/or suspensions permitted under the FAR and agency regulations including the following in accordance with "FAR 32.503-6:

a. Reasonable deductions due to defects in material or workmanship;

b. Claims which the Government may have against the Contractor under or in connection with this contract;

c. Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor; and

d. Failure to provide up to date record drawings not current as stated in Contract Clause "FAC 5252.236-9310, Record Drawings."

1.6.2 Payment for Onsite and Offsite Materials

Progress payments may be made to the contractor for materials delivered on the site, for materials stored off construction sites, or materials that are in transit to the construction sites under the following conditions:

a. FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts.

b. Materials delivered on the site but not installed, including completed preparatory work, and off-site materials to be considered for progress payment shall be major high cost, long lead, special order, or specialty items, not susceptible to deterioration or physical damage in storage or in transit to the construction site. Examples of materials acceptable for payment consideration include, but are not limited to, structural steel, non-magnetic steel, non-magnetic aggregate, equipment, machinery, large pipe and fittings, precast/prestressed concrete products, plastic lumber (e.g., fender piles/curbs) and high-voltage electrical cable. Materials not acceptable for payment include consumable materials such as nails, fasteners, conduits, gypsum board, glass, insulation, and wall coverings.

c. Materials to be considered for progress payment prior to installation shall be specifically and separately identified in the Contractor's estimates of work submitted for the Contracting Officer's approval in accordance with Earned Value Report requirement of this contract. Requests for progress payment consideration for such items shall be supported by documents establishing their value and that the title requirements of the clause at FAR 52.232-5 have been met.

d. Materials are adequately insured and protected from theft and exposure.

e. Provide a written consent from the surety company with each payment request for offsite materials.

f. Materials to be considered for progress payments prior to installation shall be stored either in Hawaii, Guam, Puerto Rico, or the Continental United States. Other locations are subject to written approval of the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 30 00.05 20

ADMINISTRATIVE REQUIREMENTS FOR DESIGN-BUILD
03/13

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Insurance

1.2 MINIMUM INSURANCE REQUIREMENTS

Procure and maintain during the entire period of performance under this contract the following minimum insurance coverage:

a. Comprehensive general liability: $500,000 per occurrence

b. Automobile liability: $200,000 per person, $500,000 per occurrence for bodily injury, $20,000 per occurrence for property damage

c. Workmen's compensation as required by Federal and State workers' compensation and occupational disease laws.

d. Employer's liability coverage of $100,000, except in States where workers compensation may not be written by private carriers,

e. Others as required by the State.

Refer to Section 01 33 00.05 20, CONSTRUCTION SUBMITTAL PROCEDURES for typical preconstruction submittals similar to insurance.

1.3 CONTRACTOR PERSONNEL REQUIREMENTS

1.3.1 Subcontractor Special Requirements

1.3.1.1 Asbestos Containing Material

All contract requirements of PART 4, F20 SELECTIVE BUILDING DEMOLITION, assigned to the Private Qualified Person (PQP) must be accomplished directly by a first tier subcontractor.

1.3.1.2 HVAC TAB

All contract requirements of TAB work required by PART 4 D30, HVAC, must be accomplished directly by a first tier subcontractor. No TAB work required

by PART 4, D30, HVAC, is allowed to be accomplished by a second tier subcontractor.

1.3.1.3 Qualified Testing Organization

All contract requirements of work required to be performed by a Qualified Testing Organization in PART 4, D50 ELECTRICAL and G40 SITE ELECTRICAL UTILITIES, must be accomplished directly by a first tier subcontractor. No work to be performed by a Qualified Testing Organization, required by PART 4, D50 and G40 is allowed to be accomplished by a second tier subcontractor.

1.4 SUPERVISION

Have at least one qualified supervisor capable of reading, writing, and conversing fluently in the English language on the job site during working hours. In addition, the Quality Control (QC) representative must also have fluent English communication skills.

1.5 AVAILABILITY OF CAD DRAWING FILES

After award and upon request, the electronic "Computer-Aided Design (CAD)" drawing files will be made available to the Contractor for use in preparation of construction drawings and data related to the referenced contract subject to the following terms and conditions.

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse is at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor shall make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractors hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished CAD files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these CAD files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project.

If the Contractor uses, duplicates or modifies these electronic CAD files for use in producing construction drawings and data related to this contract, all previous indicia of ownership (seals, logos, signatures, initials and dates) must be removed.

1.6 CLEANUP

Leave premises "broom clean." Clean interior and exterior glass surfaces

exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean filters of operating equipment. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 31 19.05 20

POST AWARD MEETINGS
09/15

PART 1 GENERAL

1.1 SUMMARY

This document includes post-award requirements for project kickoff and subsequent design and preconstruction meetings.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Design Submittal Packaging Proposal; G

Project Schedule; G

Performance Assessment Plan (PAP); G

Design Presentation Concept Site and Floor Plans; G

1.3 POST AWARD KICKOFF MEETING

The Post Award Kickoff (PAK) meeting is made up of Contract Administration, Concept Design Presentation/Design Development or Concept Design Workshop (CDW), Partnering, and Scheduling. If mutually beneficial to the Contractor and the Government, these four elements may be addressed in a single multi day meeting but most often multiple scheduled meetings are required. Schedule a separate meeting or a separate day of the multiday PAK, to accomplish the Design Presentation/Design Development Meeting.

1.3.1 PAK Meeting Schedule and Location

Within 35 calendar days after contract award, and prior to commencing work, meet with the Contracting Officer for the PAK meeting(s). The meeting will be located at a specific time and place to be determined by the Contracting Officer.

1.3.2 PAK Meeting Outcomes

The meeting(s) outcomes are:

a. Integrate the Contractor and all client representatives into the project team.

b. Achieve consensus from the project team on any issues and concerns with the Contractor's technical proposal and the User's functional

requirements. Confirm the design is within the project budget.

c. Establish and explain policies and procedures for completion of a successful project.

d. Establish clear lines of communication and points of contact for Government and Contractor team members.

e. Obtain an acceptable conceptual design including floor and site plans, signed by the client, Contractor and other key team members.

f. Establish project design schedule, design submittal packaging, and preliminary construction schedule in accordance with Section 01 32 17.05 20 COST-LOADED NETWORK ANALYSIS SCHEDULE (NAS) FOR DESIGN-BUILD. Discuss design milestones and events that will be included in the Quality Control Communication Plan.

g. Establish clear expectations and schedules for facility turnover, providing DD Form 1354 asset management records, eOMSI submittals, Guiding Principle Validation, Third Party Certification (if applicable), and training of Government maintenance personnel.

h. Establish procedure for design packages reviews, Contractor's resolution to comments, and Government's role in review of packages.

i. Establish clear expectations for Design Model presentations for projects implementing Building Information Management/Modeling (BIM).

1.3.3 PAK Meeting Contractor Attendees

The following Contractor key personnel must attend the PAK: Project Manager, Project Scheduler, Lead Designer-of-Record (DOR), Design Staff responsible for each architectural/engineering discipline when facility design is discussed, Superintendent, QC Manager, DQC Manager and the Commissioning Authority (CA). Optional attendees include: Principal, Assistant Project Manager, major subcontractors and specialized supplemental QC personnel.

1.3.4 Contract Administration

Contract administration roles and responsibilities will be addressed.

1.3.5 Design Presentation/Development (DP/D)

The Contractor must lead discussions to develop an understanding of the facility design that the accepted technical proposal represents with the Government users and maintainers of the facility. Develop site plans, floor plans, exterior finish materials, and building elevations to conduct working sessions with the Government meeting attendees. The purpose of the DP/D Meeting is to confirm the appropriateness of the facility design and develop acceptable alternatives if changes are needed. The Contractor must anticipate that Government Facility Users represented at the DP/D Meeting will provide additional functional information. Incorporate functional design changes into the facility design as required to meet the needs of the Users. At the end of the DP/D Meeting the Contractor must provide either assurance that the updated design can be built with-in the budget or identify potential cost modification items and establish a follow-on DP/D Meeting to finalize a design that will include trade-offs to bring the project within the budget.

Demonstrate ability to achieve identified Guiding Principle sustainability goals and also Third Party Certification sustainability goals, if applicable. Provide Preliminary Sustainability Notebook, refer to Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD for requirements.

1.3.5.1 Design Presentation/Development Contractor Meetings Attendees

The following Contractor key personnel must attend the Design Presentation: Project Manager, Project Scheduler, Cost Estimator, Lead Designer of Record, Design Staff responsible for each architectural/engineering discipline when facility design is discussed, Major Subcontractors, and DQC.

1.3.6 Partnering

To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership within the Project Team whose members are from the Government, Contractor and its Subcontractors. Key Personnel from the Supported Command, End User (who will occupy the facility), NAVFAC (Echelon III and/or IV), Navy Region/Installation, Contractor and Subcontractors and the Designer of Record will be invited to participate in the Partnering process. The Partnership will draw on the strength of each organization in an effort to achieve a project without any safety mishaps, conforming to the Contract, within budget and on schedule.

Information on the Partnering Process and a list of Key and Optional personnel who should attend the Partnering meeting are available from the Contracting Officer.

1.3.6.1 Formal Partnering

a. The Contractor must host the Partnering sessions with Key personnel of the Project Team, including Contractor's personnel and Government personnel. The Contractor pays all costs associated with the Partnering effort including the Facilitator, meeting room and other incidental items.

b. Before a Partnering session, the contractor must coordinate with the Facilitator all requirements for incidental items (audio-visual equipment, easels, flipchart paper, colored markers, note paper, pens/pencils, colored flash cards, etc.) and have these items available at the Partnering session. The contractor must copy documents for distribution to all attendees. The participants must bear their own costs for meals, lodging and transportation associated with Partnering.

c. The Facilitator must be experienced in conducting Partnering Workshops and acceptable to both the Government and Contractor. The Facilitator is responsible for leading the team in a timely manner and making sure that issues are identified and resolved. A list of Partnering Facilitators is available from the Contracting Officer.

d. The Initial Partnering Session must be a duration of half day minimum. It must be located at a place off the construction site as agreed to by the Contracting Officer and the Contractor. It may take place concurrently with the Pre Construction Meeting.

e. The Follow-on Partnering Session(s) generally lasts a half day or less. They must be scheduled at 3 to six month intervals or when needed. Participants are encouraged to utilize electronic means to

expedite meetings. Meetings may be held at a location off Base, at the project site, or in a Government Facility on Base. Follow-on meetings may be held concurrently with other scheduled meetings. Attendees need only be those required to resolve current issues. The same Facilitator used in the Initial Partnering session is recommended to achieve best results and for continuity.

1.3.6.2 Informal Partnering

a. The Contracting Officer must organize the Partnering Sessions with key personnel of the project team, including Contractor's personnel and Government personnel.

b. The Initial Informal Partnering session should be a part of the DB Post Award Kickoff (PAK). Partnering sessions should be held at a location agreed to by the Contracting Officer and the Contractor (typically a conference room provided by the PWD FEAD/ROICC office or the Contractor).

c. The Initial Informal Partnering Session will be conducted and facilitated using electronic media (a video and accompanying forms) provided by Contracting Officer.

d. The Partners will determine the frequency of the follow-on sessions.

1.3.7 Performance Assessment Plan (PAP)

The Performance Assessment Plan (PAP) will be used to document design innovation and budget management, provide performance feedback to the Contractor, and as a basis for interim and final evaluations in the Construction Contractor Appraisal System (CCASS) on-line database.

It is the intent of the Government to establish the PAP based on tangible, measurable indicators of outstanding contractor performance, and on commitments made in the Contractor's proposal. The initial PAP may be found on the NAVFAC Design-Build Request for Proposal Website in RFP PART 6 Attachments. Review and finalize the initial PAP during the Partnering Session. During the initial Partnering Session, the Government, the Contractor, the Designer-of-Record, and the Client will establish the PAP. Following the establishment of the PAP, the Contractor will present it, with his input, for update and discussion at projects meetings which discuss project performance. Submit an updated PAP on a monthly basis with the invoice for that period as a minimum.

1.3.8 Project Schedule

Provide in accordance with Section 01 32 17.05 20 COST-LOADED NETWORK ANALYSIS SCHEDULES (NAS) FOR DESIGN-BUILD.

1.4 DESIGN QUALITY ASSURANCE MEETINGS

After Government Quality Assurance (QA) of each Design Submittal has been completed, meet with the Government for a one-day conference to discuss review comments for the specific design submittal.

Provide consolidated copies of all Government comments with annotations of Contractor's action beside them. Notify the Contracting Officer in writing within five (5) days after receipt of Government's comments if the Contractor disagrees with comments technically or interprets comments to

exceed the requirements of the contract.

1.4.1 Design QA Meeting Attendees

The following Contractor key personnel must attend the design QA meetings: Project Manager, QC Manager, Commissioning Authority, and Contractor's Design Staff (architect and engineering disciplines related to topics to be discussed).

1.4.2 Design QA Meeting Location

Meetings shall be located at the office of the Contracting Officer's QA Team or may be conducted at other locations or by other electronic means if mutually acceptable to all parties.

1.4.3 Minimum Design QA Meeting Agenda

Address all Government comments that are unresolved and present clarification or supporting information requested by the Contracting Officer's QA team during the previous meeting.

1.5 PRECONSTRUCTION MEETING

Meet with the Contracting Officer to discuss construction items of concern to the Government and the Contractor such as outages, storage, trailer location, disposal of construction debris, and safety, at a location to be determined by the Contracting Officer. The Preconstruction meeting may take place with the PAK meeting or at any time prior to mobilization and before any construction work begins.

1.6 RECURRING MEETINGS

1.6.1 Quality Control and Production Meetings

Quality Control and Production Meetings in accordance with Section 01 45 00.05 20 DESIGN AND CONSTRUCTION QUALITY CONTROL.

1.6.2 Safety Meetings

Safety Meetings in accordance with Section 01 35 26.05 20 GOVERNMENT SAFTETY REQUIREMENTS FOR DESIGN-BUILD.

1.6.3 eOMSI Meetings

Refer to Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATIONS AND MAINTENANCE INFORMATION (eOMSI) for requirements.

1.6.4 Sustainability Documentation Progress Meetings

Most sustainability documentation progress meetings may be combined with other design, construction, and project closeout meetings; however additional meetings are required post-design and post-construction. Refer to Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD for meeting requirements.

1.7 FACILITY TURNOVER PLANNING MEETINGS (NAVFAC RED ZONE - NRZ)

Meet with the Government to identify strategies to ensure the project is carried to expeditious closure and turnover to the Client. Start the

turnover process at the PAK meeting with a discussion of the NAVFAC Red Zone (NRZ) process and convene at regularly scheduled NRZ Meetings. Include the following in the facility Turnover effort:

1.7.1 NRZ Checklist

a. Contracting Officer's Technical Representative (COTR) will provide the Contractor a copy of the NRZ Checklist template prior to 75 percent completion.

b. Prior to 75 percent completion add/delete critical activities to the NRZ Checklist template as necessary to match the project scope, and schedule critical activities and insert planned completion dates in the NRZ checklist for each critical activity. Present the NRZ Checklist to COTR and review during a regularly scheduled QC Meeting.

1.7.2 Meetings

a. Upon Government acceptance of the NRZ Checklist, the Project Superintendent is required to lead regular NRZ Meetings beginning at approximately 75 percent project completion, or three to six months prior to Beneficial Occupancy Date (BOD), whichever comes first.

b. The Contracting Officer will determine the frequency of the meetings, which is expected to increase as the project completion draws nearer.

c. Using the NRZ Checklist as a Plan of Action and Milestones (POAM) and basis for discussion, review upcoming critical activities and strategies to ensure work is completed on time.

d. Coordinate with the COTR any upcoming activities that require Government involvement.

e. Maintain the NRZ Checklist by documenting the actual completion dates as work is completed and update the NRZ Checklist with revised planned completion dates as necessary to match progress. Distribute copies of the current NRZ Checklist to attendees at each NRZ Meeting.

f. Assign responsibility and schedule for the provision of all information necessary to complete the Final eOMSI Data and Documents Submittals for facility turnover.

g. Assign responsibility and schedule for the provision of all documentation necessary to achieve Guiding Principle Validation and also Third Party Certification, if applicable.

h. Schedule and coordinate the facility training of Government maintenance personnel in accordance with 01 78 23 OPERATION AND MAINTENANCE DATA.

1.7.3 Facility Turnover NRZ Meeting Attendees

The following key personnel must attend the Facility Turnover Meetings as needed to accomplish meeting requirements: Contractor QC Manager, Design Quality Control Manager, Superintendent, Major Subcontractors, Designer-of-Record, Contracting Officer's Representative, Project Sponsor, Representative(s) of NAVFAC, the Facility Owner/ Real Property Accounting

Officer, Public Works Facility Maintenance Specialist, and the Client.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

-- End of Section --

SECTION 01 32 17.05 20

COST-LOADED NETWORK ANALYSIS SCHEDULES (NAS)FOR DESIGN-BUILD
03/15

PART 1 GENERAL

1.1 DESCRIPTION

The Contractor is responsible for scheduling all design, procurement, Contractor quality control and construction, acceptance testing and training. A single schedule must logically incorporate all design and construction for the entire project. Unless otherwise indicated, the contractor may begin construction when design is signed, stamped and submitted to the Government via the Contractor's quality control organization. If Government approval is required for any portion of a final signed and sealed design package prior to construction, that review time must be included in the schedule. The schedule must also include times for procurement, Contractor quality control and construction, acceptance testing and training. Refer to Specification Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES to determine if any items require Government approval prior to construction. If any are required, include that submittal review time in the schedule.

The schedule is a tool to manage the project, both for Contractor and Government activities. It will also be used to report progress and evaluate time extensions. The Project NAS must be cost-loaded and will provide the basis for progress payments. Use the Critical Path Method (CPM) and the Precedence Diagram Method (PDM) to satisfy time and cost applications. For consistency, when scheduling software terminology is used in this specification, the terms in Primavera's scheduling programs are used.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Qualifications; G

Design Baseline Network Analysis Schedule (NAS); G

Construction Baseline Network Analysis Schedule (NAS); G

SD-07 Certificates

Monthly Network Analysis Schedule Update; G

SD-11 Closeout Submittals

As-Built Schedule; G

1.3 SCHEDULE ACCEPTANCE PRIOR TO START OF WORK

The Design Baseline Network Analysis Schedule(NAS) must be submitted and presented to the Government at the PAK Meeting. The acceptance of a Design Baseline NAS is a condition precedent to processing Contractor's pay request(s) for design activities/items of work. The most current updated design schedule must accompany each design submittal.

The Contracting Officer and Contractor must participate in a preliminary meeting(s) to discuss the proposed schedule and requirements of this section prior to the Contractor preparing the Project Baseline Schedule. Government review comments on the Contractor's schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents. Only bonds may be paid prior to acceptance of the Baseline Network Analysis Schedule (NAS). The acceptance of a Baseline NAS is a condition precedent to:

a. The Contractor starting work on the demolition or construction stage(s) of the contract.

b. Processing Contractor's invoices(s) for construction activities/items of work.

c. Review of any schedule updates.

Submittal of the Construction Baseline Network Analysis Schedule, and subsequent schedule updates, is understood to be the Contractor's certification that the submitted schedule meets all of the requirements of the Contract Documents, represents the Contractor's plan on how the work must be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

1.4 SOFTWARE

Prepare and maintain project schedules using Primavera P6. Importing data into P6 using data conversion techniques or third party software is cause for rejection of the submitted schedule.

A listing of Primavera P6 settings and parameters which must be used in preparing the Schedules are contained later in this specification section. Deviation from these settings and parameters, without prior consent of the Contracting Officer, is cause for rejection of schedule submission.

1.5 QUALIFICATIONS

The designated Scheduler for the project must have prepared and maintained at least 3 previous schedules of similar size and complexity of this contract using Primavera P3, Primavera SureTrak, or Primavera P6. At least one of the three must be in Primavera P6. Submit a resume outlining the qualifications of the Scheduler. Payment will not be processed until an acceptable Scheduler is provided.

1.6 NETWORK SYSTEM FORMAT

The system must include time-scaled logic diagrams and specified reports.

1.6.1 Diagrams

Provide Time-scaled Logic Diagram printed in color on ANSI D size sheets. The diagram must clearly show activities on the critical path. Include the following information for each activity:

a. Activity ID

b. Activity Description

c. Original Duration in Work Days

d. Remaining duration in Work Days

e. Physical Percent Complete

f. Start Date

g. Finish Date

h. Total Float

1.6.2 Schedule Activity Properties and Level of Detail

The NAS must identify all Design, Government, Construction Quality Management (CQM), and Construction activities planned for the project and all other activities that could impact project completion if delayed. Create separate activities for each Phase, Area, Floor Level and Location the activity is occurring. Activity categories included in the schedule are specified below.

With the exception of the Contract Award and Contract Completion Date (CCD) milestone activities, no activity is allowed to be open-ended; each activity must have predecessor and successor ties. No activity shall have open start or open finish (dangling) logic. Minimize redundant logic ties. Once an activity exists on the schedule it must not be deleted or renamed to change the scope of the activity and must not be removed from the schedule logic without approval from the Contracting Officer. While an activity cannot be deleted, where said activity is no longer applicable to the schedule but must remain within the logic stream for historical record, it can be changed to a milestone. Document any such change in the milestone's "Notebook", including a date and explanation for the change. The ID number for a deleted activity must not be re-used for another activity. Within the Baseline Schedule no more than 20 percent of the activities may be critical or near critical. Critical is defined as having zero days of Total Float. "Near Critical" is defined as having Total Float of 1 to 14 days. Contractor activities must be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days.

1.6.2.1 Activity Categories

1.6.2.1.1 Design Activities

Design activities must include design decision points, design submittal packages, including any critical path submittals for Fast Tracked Phases. Review times for design development packages must be included in the schedule. Refer to Specification Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES FOR DESIGN-BUILD, for specific requirements.

1.6.2.1.2 Procurement Activities

Examples of procurement activities include, but are not limited to; Material/equipment submittal preparation, submittal and approval of material/equipment; material/equipment fabrication and delivery, and material/equipment on-site. As a minimum, separate procurement activities will be provided for critical items, long lead items, items requiring Government approval and material/equipment procurement for which payment will be requested in advance of installation. Show each delivery with relationship tie to the Construction Activity specifically for the delivery.

1.6.2.1.3 Government Activities

Government and other agency activities that could impact progress must be clearly identified. Government activities include, but are not limited to; Government approved submittal reviews, Government conducted inspections/tests, environmental permit approvals by State regulators, utility outages, Design Start, Construction Start, (including Design/Construction Start for each Fast-Track Phase, and delivery of Government Furnished Material/Equipment.

1.6.2.1.4 Quality Management (QM) Activities

The Preparatory Phase and Initial Phase for each Definable Feature of Work identified in the Contractor's Quality Control Plan must be added to each Three-Week Look Ahead Schedule referenced in the paragraph THREE-WEEK LOOK AHEAD SCHEDULE. The Follow-up Phase will be represented by the Construction Activities in the Baseline Schedule and in the schedule updates.

1.6.2.1.5 Construction Activities

No on-site construction activity is allowed to have a duration in excess of 20 working days. Contractor activities must be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days, unless otherwise defined in this contract. Government availability for construction submittal review, meeting attendance, performance verification testing, acceptance inspections, etc., will be extremely limited between Christmas and New Years Day.

1.6.2.1.6 Turnover and Closeout Activities

Include activities with all items on the NAVFAC Red Zone Checklist/POAM that are applicable to this project. The checklist will be provided at the PAK meeting. As a minimum, include all testing, specialized inspection activities, Pre-Final Inspection, Punch List Completion, Final Inspection and Acceptance. Add a milestone for the Facility Turnover Planning Meeting at approximately 75 percent construction contract completion or three to six months prior to Contract Completion Date (CCD), whichever is sooner.

1.6.2.2 Contract Milestones and Constraints

1.6.2.2.1 Project Start Date Milestones

Include as the first activity on the schedule a start milestone titled "Contract Award", which must have a Mandatory Start constraint equal to the Contract Award Date.

1.6.2.2.2 Facility Turnover Planning Meeting Milestones

See paragraph ACTIVITY CATEGORIES above.

1.6.2.2.3 Substantial Completion Milestone

Include an unconstrained finish milestone on the schedule titled "Substantial Completion". Substantial Completion is defined as the point in time the Government would consider the project ready for beneficial occupancy wherein by mutual agreement of the Government and Contractor, Government use of the facility is allowed while construction access continues in order to complete remaining items (e.g. punch list and other close out submittals).

1.6.2.2.4 Projected Completion Milestone

Include an unconstrained finish milestone on the schedule titled "Projected Completion". Projected Completion is defined as the point in time the Government would consider the project complete. This milestone must have the Contract Completion (CCD) milestone as its only successor.

1.6.2.2.5 Contract Completion Date (CCD) Milestone

Include as the last activity on the schedule a finish milestone titled "Contract Completion (CCD)". Calculation of schedule updates must be such that if the finish of the "Projected Completion" milestone falls after the contract completion date, then negative float will be calculated on the longest path and if the finish of the "Projected Completion" milestone falls before the contract completion date, the float calculation must reflect positive float on the longest path.

1.6.2.3 Work Breakdown Structure & Activity Code

At a minimum, the Contractor must establish a Work Breakdown Structure (WBS) and provide activity codes identified as follows:.

1.6.2.3.1 Work Breakdown Structure (WBS)

Group all activities and milestones within appropriate WBS categories including, at a minimum, the following:

a. Project Milestones:

(1) Management Milestones

(2) Project Administrative Meetings

b. Pre-Construction Phase:

(1) Submittals and Reviews

(2) Procurement

c. Construction Phase; Create multiple sub-sections in accordance with project specific categories of work including in WBS descending order as follows:

(1) General Area

(a) Type of Work Item

1. Location

d. Commissioning & Testing:

(1) Specific area/locations of commissioning

(2) Final Testing

(3) Training

e. Project Closeout: Include activity items such as Punchlist, Demobilization, O&M, As-built Drawings, and As-built NAS.

f. Modifications: Create multiple sub-sections as the project progresses identified by modifications issued.

1.6.2.3.2 Responsibility Code

All activities in the project schedule must be identified with the party responsible for completing the task. Activities must not belong to more than one responsible party.

1.6.2.3.3 Construction Specification Institute (CSI) Masterformat Code

Identify all activities in the project schedule with its respective Specification Section number. Activities must not belong to more than one Section number. If an activity does not have an applicable CSI Code (e.g. Mobilize), the code must be "0000".

1.6.2.4 Anticipated Weather Lost Work Days

Use the following schedule of anticipated monthly non-work days due to adverse weather as the basis for establishing a "Weather Calendar" showing the number of anticipated non-workdays for each month due to adverse weather, in addition to Saturdays, Sundays and all Federal Holidays as non-work days.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS (Joint Base Pearl Harbor Hickam)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3	2	2	0	0	0	0	0	0	1	2	3

MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS (MCBH Kaneohe Bay, Oahu)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	3	3	3	2	0	1	1	1	2	4	4

MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS (NCTAMS PAC Wahiawa, Oahu)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
6	3	4	3	1	0	1	0	1	2	3	3

MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS (PMRF Barking Sands, Kauai)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3	2	2	1	1	0	0	0	0	2	3	3

Assign the Weather Calendar to any activity that could be impacted by adverse weather. The Contracting Officer will issue a modification in accordance with the contract clauses, giving the Contractor a time extension for the difference of days between the anticipated and actual adverse weather delay if the number of actual adverse weather delay days exceeds the number of days anticipated for the month in which the delay occurs and the adverse weather delayed activities are critical to contract completion. A lost workday due to weather conditions is defined as a day in which the Contractor cannot work at least 50 percent of the day on the impacted activity.

1.6.2.5 Anticipated Restricted Delays

Unless otherwise noted or defined in Section 01 14 00.05 20 WORK RESTRICTIONS FOR DESIGN-BUILD, allow in the schedule a total of 5 lost workdays per calendar year for instances where base access is not permitted due to a restriction or closure which causes a delay in the work. A lost workday is defined as a day which the Contractor cannot work at least 50 percent of the day on the closed installation. If the installation is closed for a period longer than 5 lost workdays per calendar year, the Contracting Officer will issue a no cost contract modification as applicable in accordance with the contract clauses extending the contract completion date where the critical path has been impacted.

1.6.2.6 Cost Loading

1.6.2.6.1 Cost Loading Activities

Assign Material and Equipment Costs, for which payment will be requested in advance of installation, to their respective procurement activity (i.e., the material/equipment on-site activity). Assign cost for material/equipment, paid for after installation; labor; and construction equipment to their respective Construction Activities. The value of commissioning, testing and closeout WBS section must not be less than 10 percent of the total costs for Procurement and Construction Activities. Evenly disperse overhead and profit to each activity over the duration of the project.

1.6.2.6.2 Quantities and Units of Measure

Each cost loaded activity must have a detailed quantity breakdown and unit of measure. Lump sum costing is not acceptable.

1.6.3 Schedule Software Settings and Restrictions

a. Activity Constraints: Date/time constraint(s), other than those required by the contract, are not allowed unless accepted by the Contracting Officer. Identify any constraints proposed and provide an explanation for the purpose of the constraint in the Narrative Report as described in Paragraph REQUIRED TABULAR REPORTS..

b. Default Progress Data Disallowed: Actual Start and Actual Finish dates on the CPM schedule must match the dates on the Contractor Quality Control and Production Reports.

c. Software Settings: Handle schedule calculations and Out-of-Sequence progress (if applicable) through Retained Logic, not Progress Override. Show all activity durations and float values in days. Show activity progress using Remaining Duration. Set default activity type to "Task Dependent".

d. At a minimum, include the following settings and parameters in Baseline Schedule preparation:

(1) General: Define or establish Calendars and Activity Codes at the "Project" level, not the "Global" level.

(2) Admin Drop-Down Menu, Admin Preferences, Time Periods Tab:

(a) Set time periods for P6 to 8.0 Hours/Day, 40.0 Hours/Week, 172.0 Hours/Month and 2000.0 Hours/Year.

(b) Use assigned calendar to specify the number of work hours for each time period: must be checked.

(3) Admin Drop-Down Menu, Admin Preferences, Earned Value Tab:

(a) Earned Value Calculation: Use "Budgeted values with current dates".

(4) Project Level, Dates Tab:

(a) Set "Must Finish By" date to "Contract Completion Date".

(5) Project Level, Defaults Tab:

(a) Duration Type: Set to "Fixed Duration & Units".

(b) Percent Complete Type: Set to "Physical".

(c) Activity Type: Set to "Task Dependent".

(d) Calendar: Set to "Standard 5 Day Workweek". Calendar must reflect Saturday, Sunday and all Federal holidays as non-work days. Alternative calendars may be used with Contracting Officer approval.

(6) Project Level, Calculations Tab:

(a) Activity percent complete based on activity steps: Must be Checked.

(b) Reset Remaining Duration and Units to Original: Must be Checked.

(c) Subtract Actual from At Completion: Must be Checked.

(d) Recalculate Actual units and Cost when duration percent complete changes: Must be Checked.

(e) Link Actual to Date and Actual This Period Units and Cost: Must be Checked.

(f) Price/Unit: Set to "$1/h".

(g) Update units when costs change on resource assignments: Must be Unchecked.

(7) Project Level, Settings Tab:

(a) Define Critical Activities: Check "Total Float is less than or equal to" and add "0d".

(8) Work Breakdown Structure Level, Earned Value Tab:

(a) Technique for Computing Performance Percent Complete: "Activity percent complete" is selected.

(b) Technique for Computing Estimate to Complete (ETC): "PF = 1" is selected.

1.6.4 Required Tabular Reports

Include the following reports with the Baseline, Monthly Update and any other required schedule submittals:

a. Log Report: Listing of all changes made between the previous schedule and current updated schedule.

b. Narrative Report: Identify and justify:

(1) Progress made in each area of the project;

(2) Critical Path;

(3) Date/time constraint(s), other than those required by the contract

(4) Changes in the following; added or deleted activities, original and remaining durations for activities that have not started, logic, milestones, planned sequence of operations, critical path, and cost loading;

(5) Any decrease in previously reported activity Earned Amount;

(6) Pending items and status thereof, including permits, changes orders, and time extensions;

(7) Status of Contract Completion Date and interim milestones;

(8) Current and anticipated delays (describe cause of delay and corrective actions(s) and mitigation measures to minimize);

(9) Description of current and future schedule problem areas.

Each entry in the narrative report must cite the respective Activity ID and Activity Description, the date and reason for the change, and description of the change.

c. Earned Value Report: List all activities having a budget amount cost

loaded. Compile total earnings on the project from notice to proceed to current progress payment request. Show current budget, previous physical percent complete, to-date physical percent complete, previous earned value, to-date earned value and cost to complete on the report for each activity.

d. Schedule Variance Control (SVC) Diagram: With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates and 2) Earned Value to-date. Revise Cash Flow S-Curves when the contract is modified, or as directed by the Contracting Officer.

e. Daily Reported Production Activity: Submit on a monthly basis, in electronic spreadsheet format, a summary of daily reported production activity for the reporting month in the update schedule. Use the following columns for reporting:

(1) Date

(2) Activity ID

(3) Work Description

(4) Contractor

(5) Billable Hours

1.7 SUBMISSION AND ACCEPTANCE

1.7.1 Design Baseline NAS

The Design Baseline NAS must include detailed design activities, general (summarized) approach for the construction phase(s) of the project and required milestone activities. If the project is being Fast-Tracked or allows Early Start of construction, the Design Baseline Project Schedule must include all fast-tracked design construction phases, etc., including the required or proposed critical path design submittals within each phase that will occur during the duration of the project.

The Contractor must develop the Construction Baseline Schedule as design progresses, with detailed construction activities. If design must be completed and accepted prior to construction, submit the complete design and construction network analysis schedule and obtain acceptance prior to starting construction work. If the project is Fast-Tracked, each construction stage must be detailed and built upon the previous Fast-Tracked Baseline Schedule (including any interim updates) and accepted prior to starting that stage of the construction work. Payment for completed work is dependent on an accepted, detailed schedule for that portion of work.

1.7.2 Monthly Network Analysis Updates

Contractor and Government representatives must meet at monthly intervals to review and agree on the information presented in the updated project schedule. The submission of an acceptable, updated schedule to the Government is a condition precedent to the processing of the Contractor's invoice. Submit an acceptable, updated schedule to the Government regardless of whether a Contractor's invoice is submitted for the given

period. The Contractor and Government must agree on percentage of payment for each activity progressed during the update period.

Provide the following with each Schedule submittal:

a. Time-Scaled Logic Diagram.

b. Reports listed in paragraph entitled "REQUIRED TABULAR REPORTS."

c. Data disks containing the project schedule. Include the back-up native .xer program files.

1.7.3 As-Built Schedule

As a condition precedent to the release of retention and making final payment, submit an "As-Built Schedule," as the last schedule update showing all activities at 100 percent completion. This schedule must reflect the exact manner in which the project was actually constructed.

1.8 CONTRACT MODIFICATION

Submit a Time Impact Analysis (TIA) with each cost and time proposal for a proposed change. TIA must illustrate the influence of each change or delay on the Contract Completion Date or milestones. No time extensions will be granted nor delay damages paid unless a delay occurs which consumes all available Project Float, and extends the Projected Finish beyond the Contract Completion Date.

a. Each TIA must be in both narrative and schedule form. The narrative must define the scope and conditions of the change; provide start and finish dates of impact, successor and predecessor activity to impact period, responsible party; describe how it originated, and how it impacts the schedule. The schedule submission must consist of three native files:

(1) Fragnet used to define the scope of the changed condition

(2) Most recent accepted schedule update as of the time of the proposal or claim submission that has been updated to show all activity progress as of the time of the impact start date.

(3) The impacted schedule that has the fragnet inserted in the updated schedule and the schedule “run” so that the new completion date is determined.

b. If the impact has not occurred within 30 calendar days, TIA procedure must be reduced to the most basic level possible to still reflect a reasonable assessment of the result of a delay, representing actual conditions as they occurred.

c. All TIAs must include any mitigation, and must determine the apportionment of the overall delay assignable to each individual delay. The associated narrative must clearly describe the findings in a chronological listing beginning with the earliest delay event.

(1) Identify types of delays as follows:

(a) Excusable Delay: Force-Majeure (e.g. weather) - Contractor may receive time extension, but time will not be compensable.

(b) Inexcusable Delay: Contractor Responsibility - Contractor must not receive time extension.

(c) Compensable Delay: Government Responsibility - Contractor may receive compensable time extension.

(2) If a combination of delay types occurs, it is considered Concurrent Delay, which is defined in the following combinations:

(a) Excusable Delay and Compensable Delay results in Excusable Delay

(b) Excusable Delay and Inexcusable Delay results in Inexcusable Delay

(c) Compensable Delay and Inexcusable Delay results in Excusable Delay

d. Submit Data disks containing the narrative and native schedule files.

e. Unless the Contracting Officer requests otherwise, only add conformed contract modifications into the Project NAS.

1.8.1 No Reservation of Rights

All direct costs, indirect cost, and time extensions must be negotiated and made full, equitable and final at the time of modification issuance.

1.9 PROJECT FLOAT

Project Float is the length of time between the Contractor's Projected Completion Milestone and the Contract Completion Date Milestone. Project Float available in the schedule is not for the exclusive use of either the Government or the Contractor.

The use of Resource Leveling or other techniques used for the purpose of artificially adjusting activity durations to consume float and influence critical path is prohibited.

1.10 THREE-WEEK LOOK AHEAD SCHEDULE

Prepare and issue a 3-Week Look Ahead schedule to provide a more detailed day-to-day plan of upcoming work identified on the Project Network Analysis Schedule. Key the work plans to NAS activity numbers and update each week to show the planned work for the current and following two-week period. Additionally, include upcoming outages, closures, field evaluation tests, preparatory meetings, and initial meetings. Identify critical path activities on the Three-Week Look Ahead Schedule. The detail work plans are to be bar chart type schedules, derived from but maintained separately from the Project NAS on an electronic spreadsheet program and printed on 8-1/2 by 11 inch sheets as directed by the Contracting Officer. Activities must not exceed 5 working days in duration and have sufficient level of detail to assign crews, tools and equipment required to complete the work. Three hard copies and one electronic file of the 3-Week Look Ahead Schedule must be delivered to the Contracting Officer no later than 8 a.m. each Monday and reviewed during the weekly CQC Coordination and/or Production Meeting.

1.11 CORRESPONDENCE AND TEST REPORTS

All correspondence (e.g., letters, Requests for Information (RFIs), e-mails, meeting minute items, Production and QC Daily Reports, material delivery tickets, photographs) must reference Schedule activity IDs that are being addressed. All test reports (e.g., concrete, soil compaction, weld, pressure) must reference schedule activity IDs that are being addressed.

1.12 ADDITIONAL SCHEDULING REQUIREMENTS

Any references to additional scheduling requirements, including systems to be inspected, tested and commissioned, that are located throughout the remainder of the Contract Documents, are subject to all requirement of this section.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 00.05 20

CONSTRUCTION SUBMITTAL PROCEDURES
05/14

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

This section covers construction submittals that are not included in the design submittals. Submit design submittals in accordance with 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES. When using Unified Facility Guide Specifications (UFGS) sections that reference Section 01 33 00 SUBMITTAL PROCEDURES, change reference to this section, Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

1.2 SUBMITTAL DESCRIPTIONS (SD)

Submittal requirements are specified in UFGS in Part 2, GENERAL REQUIREMENTS; in references in Part 4 PERFORMANCE TECHNICAL SPECIFICATIONS; and in UFGS in Part 5, PRESCRIPTIVE SPECIFICATIONS. Submittals that are identified by SD numbers use descriptions of items included in submittal packages and titles as follows:

SD-01 Preconstruction Submittals

Certificates of insurance.

Surety bonds.

List of proposed subcontractors.

List of proposed products.

Construction progress schedule.

Network Analysis Schedule (NAS)

Submittal register.

Schedule of prices or earned value report.

Health and safety plan.

Work plan.

Quality control and commissioning plans.

Environmental protection plan.

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

Manufacturer's data certifying and demonstrating that specific product, process, and/or conditions complies with applicable Guiding Principle GP) or Third Party Certification (TPC) criteria.

SD-04 Samples

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuing work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example, Record Drawings, As-built drawings, DD Form 1354, Guiding Principles Validation or Sustainability Third Party Certification (TPC), Sustainability Notebook (including all of components) and eOMSI submittals. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.3 SUBMITTALS

The use of a "G" following a submittal indicates that an approval action is required, either by the Government or by the Contractor's Designer of Record (DOR) or QC Specialist.

The use of an "S" following a submittal indicates separate but simultaneous submittal is required as part of federally mandated sustainability requirements. Refer to Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD for "S" submittal requirements.

Submit the following in accordance with the requirements of this section.

SD-01 Preconstruction Submittals

Submittal Register Format; G

1.3.1 Submittal Register

The submittal register must be prepared during the initial design stages of the project and indicate each design and construction submittal. Maintain an electronic version of the submittal register as work progresses. The DOR must assist the DQC in preparing the submittal register by determining all project submittals that require DOR approval. The Contractor proposed submittal register format must include all types of information pertinent to the submittal process and be approved by the Contracting Officer prior to the first submission.

1.4 CONSTRUCTION QUALITY CONTROL

1.4.1 Contractor Reviewing, Certifying, Approving Authority

The QC organization is responsible for reviewing and certifying that submittals are in compliance with the contract requirements.

a. In RFP PART 4 PERFORMANCE TECHNICAL SPECIFICATIONS (PTS), there are UFGS specification sections required to be submitted as part of the design submittal. Unless specified otherwise in this section, the Contractor's DOR is the approving authority for submittals listed in these specifications with a "G" designation, unless the DOR delegates to Contractor Quality Control approval. RFP Part 4 PTS sections also include submittals identified for DOR approval that are not denoted with a "G" designation, these submittals cannot be delegated for Contractor Quality Control approval.

b. If RFP PART 5 PRESCRIPTIVE SPECIFICATIONS are utilized in this RFP, the Contractor's DOR is the approving authority for submittals listed with a "G" designation, unless the DOR delegates to Contractor Quality Control approval.

c. DOR must approve construction submittals that are incorporated in the design submittal prior to being submitted to the Government for design submittal approval. Indicate approval of these construction submittals on the accompanying submittal transmittal forms and the submittal register for each design submittal package. In addition, the DOR professional stamp on the final design submittal indicates approval of construction submittals combined with the design submittal.

d. Submittal items identified in RFP PARTS 2, 4, and 5 that are not identified with a "G" designation or not designated for DOR approval (in RFP Part 4) are for Contractor Quality Control approval.

e. Construction submittals that are approved by the DOR or certified by the QC are not required to be submitted to the Government for

surveillance, except when the RFP requires the design and construction submittals to be combined in Section 01 33 10.05 20, DESIGN SUBMITTAL PROCEDURES or where specified in the paragraph SUBMITTALS RESERVED FOR GOVERNMENT SURVEILLANCE of this section.

f. In addition to other approvals that may be required, provide review and approval of Guiding Principles Validation and TPC Submittals by Design-Build team's Sustainability or TPC Professional. Provide this approval prior to including in any Government-reviewed submittal.

1.4.2 Submittals Reserved for Government Surveillance

Surveillance submittals are approved by the Contractor in accordance with paragraph CONTRACTOR REVIEWING, CERTIFYING, AND APPROVING AUTHORITY, but provide the Government the opportunity to oversee critical project issues.

If during the Government surveillance of construction submittals, items are brought to the Contractor's attention as non-compliant, the Contractor must correct the submittal and construction to comply with the requirements of the RFP. Stamp surveillance submittals "APPROVED" by the DOR or QC Specialist and "FOR SURVEILLANCE ONLY." Submit the following Government surveillance submittals, prior to starting work for construction submittal items, and after the completion of the work for reports submittals items.

a. Submit fire protection related submittals pertaining to spray-applied fire proofing and fire stopping, exterior fire alarm reporting systems, interior fire alarm and detection systems, and fire suppression systems including fire pumps and standpipe systems.

b. Submit geotechnical related submittals pertaining to the soils investigations (reports and soils analysis), foundations (shallow and deep), pavements structure design, test pile and production pile testing and installation.

c. Submit conveying related submittals pertaining to elevators, escalators, weight handling equipment, lifts, and conveyors.

d. Submit roofing submittals pertaining to materials and systems used to make up the roof system.

e. Submit HVAC Testing, Adjusting, and Balancing required submittals.

f. Submit telecommunications shop drawings, as described in Part 4, D50 ELECTRICAL, for coordination with the NMCI Contractor.

g. Submit Performance Verification and Acceptance Testing submittals listed in the PTS and referenced UFGS.

h. Submit all Interim Special Inspection Reports on a bi-weekly basis until work requiring special inspections is complete.

i. Submit all Structural Observation Reports and the Final Report of Special Inspections.

j. Submit Final Guiding Principle Validation and TPC sustainability documentation.

k. Submit the exterior enclosure barrier drawings.

l. Submit building enclosure testing results for air tightness and the infrared thermography results if air barrier deficiencies are identified. Describe actions taken to correct building enclosure deficiencies at each location.

m. Major mechanical and electrical equipment such as plumbing fixtures, water heating equipment, chillers, pumps, air handling units, transformers, generators, electrical panels and electrical fixtures.

1.4.3 Submittals Reserved for Government Approval

The Government is the approving authority for submittals with a "G" designation in RFP Part 2 GENERAL REQUIREMENTS specification sections. Comply with additional Government approval requirements for Environmental submittals, as specified in RFP Part 2, Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS and Section 01 57 19.01 20, SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS.

In addition to the Government approvals required by RFP Part 2, GENERAL REQUIREMENTS, the following submittals must be certified by the QC Manager and the DOR, and approved by the Contracting Officer.

a. Site Electrical Systems: Substations, Transformers, Medium Voltage, Switchgear, Medium Voltage Cable, 400-Hz Converters, Emergency Generators, Automatic Transfer Switches, Uninterruptible Power Supplies, Electronic Security Systems.

b. Site Utility (Water and Sewer) Systems: Piping, Valves, Pumps.

1.4.3.1 Scheduling for Government Approved Submittals

Except as specified otherwise, allow review period, beginning when Government receives submittal from the QC organization, of 20 working days for return of submittal to the Contractor. Period of review for submittals with Contracting Officer approval begins when Government receives submittal from QC organization. Period of review for each resubmittal is the same as for initial submittal.

1.4.4 Constraints

a. Submittals must be complete for each definable feature of work; submit components of definable feature interrelated as a system at the same time.

b. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.4.5 Design Change and Variation

The Contractor must limit change and variation to items that will be advantageous to the Government. Submit proof that the change or variation is needed and provide the same or better level of quality as the design that the Government originally reviewed or approved. Design change is considered prior to Government approval of the final design and variation is considered after Government approval of final design.

1.4.5.1 Design Changes

Design changes must meet the minimum requirements of the solicitation and the accepted proposal. Any changes to the design from what was previously reviewed by the Government during any phase of the design process prior to Government approval of the Final Design must be approved by the DOR and Government before the design change may be incorporated into the design documents. Design changes must be requested in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES.

1.4.5.2 Variations

Variations from contract requirements including the solicitation, the accepted proposal, and the final design, require Government approval. Variations must be approved by the DOR prior to submitting written request to the Government for approval.

a. Considering Variations

Discuss the proposed variation with the Contracting Officer after consulting with the DOR prior to submission to help ensure functional and quality requirements are met and minimize potential rejections and re-submittals. When contemplating a variation which results in lower cost, consider submitting the variation as a Value Engineering Change Proposal (VECP) in accordance with FAR 52.248-3. Specifically point out variations from contract requirements in transmittal letters as applicable. Failure to receive prior Government approval for deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

b. Submitting Variations

When submitting a variation, deliver the written request to the Contracting Officer in the form of a Request for Information (RFI) to include documentation illustrating the nature and features of the variation including any necessary technical submittals and why the variation is desirable and beneficial to Government. Request must also include any savings to the government and documented approval from the DOR.

The Contracting Officer will indicate an approval or disapproval of the variation request; and if not approved as submitted, will indicate the Government's reasons therefor. Any work done before such approval is received is performed at the Contractor's risk.

c. Warranting Variations Are Compatible

When proposing a variation for approval, the Contractor, including its Designer(s) of Record, warrants that the contract documents have been reviewed to establish that the variation, if incorporated, is compatible with the design intent and operational requirements.

1.4.6 Contractor's Responsibilities

Ensure no work has begun until submittals for that work have been "approved" or "approved as noted."

1.4.7 QC Organization Responsibilities

Stamp each sheet of each submittal with QC certifying statement or approving statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.

a. When approving authority is Contracting Officer, QC organization will certify submittals, assure proper signatures, and forward to Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number (insert contract number here), is in compliance with the contract documents, can be installed in the allocated spaces, and is submitted for Government approval.

RFP Part Two Submittals:

Certified by QC Manager _____, Date _____
(QC Manager)

RFP Part Four and Part Five Submittals:

Certified by DOR _____, Date _____

Certified by QC Manager _____, Date _____"

(1) Sign certifying statement or approval statement. The person signing certifying statements must be QC organization member designated in the approved QC plan. The signatures must be in original ink. Stamped signatures are not acceptable.

(2) Update submittal register database as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by Contracting Officer.

(3) Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

b. When the Approving Authority is the Designer of Record, the DOR must approve, professionally stamp, sign, and date submittals. DOR stamp on construction submittals or submission of design documents that include construction submittals indicates DOR approval for construction. QC organization must certify submittals, assure proper signatures, and forward to Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number (insert contract number here), is in compliance with the contract requirements, can be installed in the allocated spaces, and is submitted for DOR approval.

RFP Part Four and Part Five Submittals:

Approved by DOR _____, Date _____

Certified by QC Manager _____, Date _____"

(1) Sign certifying statement or approval statement. The person signing certifying statements must be QC organization member designated in the approved QC plan. The signatures must be in original ink. Stamped signatures are not acceptable.

(2) Update submittal register database as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by Contracting Officer.

(3) Send copies of final DOR or QC Specialist approved and signed submittals that are identified in this section for Government surveillance to the Contracting Officer. Stamp copies "For Surveillance Only."

1.4.8 Government's Responsibilities

When approving authority is the Contracting Officer, the Government will:

a. Note date on which submittal was received from QC Manager, on each submittal.

b. Review submittals for compliance with contract documents.

1.4.8.1 Government Actions

Submittals will be returned with one of the following notations:

a. Submittals marked "approved" or "approved as submitted" authorize Contractor to proceed with work covered.

b. A submittal marked "not reviewed" will be returned with an explanation of the reason it was not reviewed.

c. Submittals marked "approved as noted" or "approval except as noted; resubmission not required" authorize Contractor to proceed with work as noted provided Contractor takes no exception to the notations.

d. Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with design concept or requirements of the contract documents and must be resubmitted with appropriate changes. No work is allowed to proceed for this item until resubmittal is approved.

e. Submittals required for surveillance will be returned only if corrective actions are required.

1.5 FORMAT OF SUBMITTALS

1.5.1 Transmittal Form

Transmit submittals with transmittal form prescribed by Contracting Officer and standard for the project.

1.5.1.1 Combined Design and Construction Submittal Notification

Indicate on the design submissions transmittal form, which construction submittals have been combined with the design documents. Coordinate transmittal form list of combined design and construction submittals with submittal register to indicate DOR approval of all combined submittals.

1.5.1.2 Sustainable Design and Construction Submittals

On all projects, provide sustainability submittals in accordance with requirements of this document, specification Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD and FC 1-300-09N, "Navy and Marine Corps Design Procedures". Specific submittal requirements are also identified in technical sections of the specifications. Separate out data demonstrating compliance with construction sustainability requirements and submit separately but concurrently.

1.5.2 Identifying Submittals

When submittals are provided by a Subcontractor, the Prime Contractor is to prepare, review and stamp with Contractor's approval all specified submittals prior to submitting for Government approval.

Identify submittals, except sample installations and sample panels, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:

a. Project title and location.

b. Construction contract number.

c. Date of the drawings and revisions.

d. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other subcontractor associated with the submittal.

e. Section number of the specification section by which submittal is required.

f. Submittal description (SD) number of each component of submittal.

g. When a resubmission, add alphabetic suffix on submittal description, for example, submittal 18 would become 18A, to indicate resubmission.

h. Product identification and location in project.

1.5.3 Format for SD- 02 Shop Drawings

a. Shop drawings are not to be less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless other form is required. Drawings are to be suitable for reproduction and be of a quality to produce clear, distinct lines and letters with dark lines on a white background.

b. Present 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.

c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph IDENTIFYING SUBMITTALS of this section.

d. Number drawings in a logical sequence. Each drawing is to bear the

number of the submittal in auniform location adjacent to the title block. Place the Government contract number in the margin, immediately below the title block, for each drawing.

e. Reserve a blank space, no smaller than 4 inches the right hand side of each sheet for the Government disposition stamp.

f. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

g. Include the nameplate data, size and capacity on drawings. Also include applicable federal, military, industry and technical society publication references.

1.5.4 Format of SD - 03 Product Data and SD - 08 Manufacturer's Instructions

a. Present product data submittals for each section as a complete bound volume. Include table of contents, listing page and catalog item numbers for product data.

b. Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.

c. Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of SD-07 Certificates.

d. Provide product data in metric dimensions. Where product data are included in preprinted catalogs with English units only, submit metric dimensions on separate sheet.

e. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, submit as specified for SD-07 Certificates.

f. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC) submit proof of such compliance. The label or listing by the specified organization is acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

g. Collect required data submittals for each specific material, product, unit of work, or system into a single submittal and marked for choices, options, and portions applicable to the submittal. Mark each copy of

the product data identically. Partial submittals will not be accepted for expedition of construction effort.

h. Submit manufacturer's instructions prior to installation.

1.5.5 Format of SD - 04 Samples

Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:

a. Sample of Equipment or Device: Full size.

b. Sample of Materials Less than 2 by 3 inches: Built up to 8 1/2 by 11 inches.

c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.

d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.

e. Sample of Non-Solid Materials: 1.6 pints. Examples of non-solid materials are sand and paint.

f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.

g. Sample Panel: 4 by 4 feet.

h. Sample Installation: 100 square feet.

i. Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.

j. Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples are to be in undamaged condition at time of use. Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean-up of project.

When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.5.6 Format of SD - 05 Design Data and SD - 07 Certificates

Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.

1.5.7 Format of SD-06 Test Reports and SD - 09 Manufacturer's Field Reports

Provide reports on 8 1/2 by 11 inches paper in a complete bound volume. Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

1.5.8 Format of SD - 10 Operation and Maintenance Data (O&M)

Comply with the requirements specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA for O&M Data format.

1.5.9 Format of SD - 01 Preconstruction Submittals and SD - 11 Closeout Submittals

When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.

Provide all dimensions in administrative submittals in English .

1.6 QUANTITY OF SUBMITTALS

1.6.1 Quantity of Submittals Reserved for Government Approval

Submit four copies of submittals of shop drawings requiring review and approval by Contracting Officer.

1.6.2 Quantity of Submittals Reserved for Government Surveillance

Submit three copies of submittals specified for surveillance to the Contracting Officer. Submit two additional copies of elevator submittals directly to the NAVFAC Elevator Specialist responsible for the NAVFAC elevator certification of the project.

1.6.3 Electronic Submittals

Where practicable, in lieu of hard copy copies, construction submittals may be transmitted electronically with approval from the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 10.05 20

DESIGN SUBMITTAL PROCEDURES
09/15

PART 1 GENERAL

1.1 SUMMARY

This section includes requirements for Contractor-originated design documents and design submittals.

1.2 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. The latest version of the publication at time of award must be used.

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014) Navy and Marine Corps Design Procedures
UFC 1-200-01	(2013) General Building Requirements
UFC 1-300-08	(2009, with Change 2) Criteria for Transfer and Acceptance of DoD Real Property

1.3 UFC 1-200-02

UFC 1-200-01 requires compliance with UFC 1-200-02, "High Performance and Sustainable Building Requirements". UFC 1-200-02 replaces and cancels UFC 4-030-01, Sustainable Development and UFC 3-400-01, Energy Conservation.

1.4 UFC 3-600-10N and UFC 3-800-10N

UFC 3-600-10N and UFC 3-800-10N are only available on the NAVFAC Design-Build Website under the Design Guidance link: http://www.wbdg.org/ndbm/design_guidance.php. These Draft UFCs are applicable as final documents for Navy projects.

1.5 GENERAL DESIGN REQUIREMENTS

Contractor-originated design documents must provide a project design that complies with the Request For Proposal (RFP), FC 1-300-09N, UFC 1-200-01, the Core UFCs, and other UFC's listed above.

1.6 SUBMITTALS

Submit design submittals, including shop drawings used as design drawings, to the Government for approval. The use of a "G" following a submittal indicates that a Government approval action is required. Submit the following in accordance with this section and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

Submittals with an "S" are for inclusion in the Sustainability Notebook in

conformance to Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD for "S" submittal requirements. Submit the following in accordance with this section and Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Consolidated RFP Documents; G

Submittal Register; G

SD-04 Samples

Final framed rendering and copies; G

SD-05 Design Data

Design Drawings; G

Specifications; G

Basis of Design; G

Design Submittals; G

Sustainability Notebook; G

Project Rendering; G

BIM Project Execution Plan (PxP); G

Design Model; G

Visual Review Report; G

Clash Detection Report; G

SD-11 Closeout Submittals

Record Documents; G

Final Sustainability Notebook; G; S

DD Form 1354; G

Final Record Model; G

1.7 DESIGN QUALITY CONTROL

1.7.1 Contractor Reviewing and Certifying Authority

The QC organization is responsible for reviewing and certifying that design submittals are in compliance with the contract requirements.

1.7.2 Government Approving Authority

The Contracting Officer is the approving authority for design submittals.

1.7.3 Designer of Record Certifying Authority

The Designer of Record (DOR), as registered and defined in FC 1-300-09N, is the design certifying authority. The DOR accepts responsibility for design of work in each respective design discipline, by stamping and approving final construction drawings submitted to the Government approval authority.

1.7.4 Contractor Construction Actions

Upon submission of sealed and signed design documents certified by the DOR, Design Quality Control (DQC) Manager and the Quality Control (QC) Managers, the Contractor may proceed with material and equipment purchases, fabrication and construction of any elements covered by that submittal, except as specified in the following paragraph.

1.7.4.1 Exception to Contractor Construction Actions

The Government will approve the following final submittals before the Contractor shall be allowed to proceed with construction:

a. Any design submittal that includes or will be impacted by a design change to the contract. Final Government approval of the design change is required before construction can begin on the work included in that design submittal.

1.7.5 Contractor's Responsibilities

a. Designate a lead licensed architect or engineer to be in responsible charge to coordinate the design effort of the entire project. This lead architect or engineer must coordinate all design segments of the project to assure consistency of design between design disciplines.

b. With the Designer of Record, verify site information provided in the RFP. In addition, provide additional field investigations and verification of existing site conditions as may be required to support the development of design and construction of the project.

c. Indicate on the transmittal form accompanying submittal which design submittals are being submitted as shop drawings.

d. Advise Contracting Officer of variations, as required by paragraph VARIATIONS.

e. Provide an updated, cumulative submittal register with each design package that identifies the design and construction submittals required by that design package and previous submittals.

f. Refer to Section 01 33 29.05 20, SUSTAINABILITY REPORTING FOR DESIGN-BUILD for Contractor's responsibilities for Guiding Principle Validation and Third Party Certification.

g. Refer to Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI) for Contractor's eOMSI responsibilities.

1.7.6 QC Organization Responsibilities

a. Both the CA and the QC Manager must certify design submittals for compliance with the contract documents. The DOR stamp on drawings

indicates approval from the DOR.

b. QC organization must certify submittals forwarded by the Designer of Record (DOR) to the Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with Contract Number (insert contract number here), is in compliance with the contract documents, and is submitted for Government approval.

Certified by Design Quality Control (DQC) Manager
_____, Date _____

Certified by QC Manager_____,
Date _____"

c. Sign certifying statement. The persons signing certifying statements must be the QC organization members designated in the approved QC plan. The signatures must be in original ink. Stamped signatures are not acceptable.

d. Update submittal register as submittal actions occur and maintain the submittal register at project site until final approval of all work by Contracting Officer.

e. Retain a copy of approved submittals at project site.

1.7.7 Government Responsibilities

The Government will:

a. Note date on which submittal was received from QC manager, on each submittal.

b. Perform a quality assurance (QA) review of submittals. Government will notify Contractor when comments for that design package are posted and ready for Contractor evaluation and resolution.

c. Upon submittal of final design package and resolution of comments by the Contractor, the Government will sign final design package, when approved, and return electronic copy of signed design documents to the Contractor.

1.7.7.1 Actions Possible

Submittals will be returned with one of the following notations:

a. Submittals may be marked "approved."

b. Submittals marked "not reviewed" indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and certified by Contractor, or is not complete. Submittal will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

c. Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with design concept or

requirements of the contract documents and must be resubmitted with appropriate changes. If work has been started on the unacceptable portion of the design submittal, the Contractor must propose corrective action. No further work is allowed to proceed until the issue is resolved in a manner satisfactory to the Government.

1.8 DESIGN DOCUMENTS

Provide design documents that include basis of design, design drawings, and design specifications, reports, and submittal register in accordance with FC 1-300-09N, Navy and Marine Corps Design Procedures.

The Contractor is encouraged to make product, material, and system selections during the project design and indicate these choices on the design documents. Accomplish this by submitting design drawings and specifications that include proprietary submittal information such as manufacturers name, product names, model numbers, product data, manufactures information, provided optional features, appropriate connections, fabrication, layout, and product specific drawings. Adherence to RFP submittal requirements and provision of DOR approved construction submittal information on the design submittals - eliminates the need for follow-on traditional construction submittals after the final design is approved.

The Contractor is required to submit proprietary information to describe the construction submittal information in the design documents for all products, materials, and systems submittals listed below:

a. All building enclosure components.

b. All roof components.

c. Major mechanical and electrical equipment such as plumbing fixtures, water heating equipment, pumps, air handling equipment, chillers, transformers, generators, electrical panels and electrical fixtures.

d. Interior finishes.

e. Fire protection and life safety devices.

Refer to 01 33 00.05 20, CONSTRUCTION SUBMITTAL PROCEDURES for requirements pertaining to Contractor proposed design changes or variations.

1.9 DESIGN DRAWINGS

Prepare, organize, and present design drawings in accordance with the requirements of FC 1-300-09N, Navy and Marine Corps Design Procedures.

Submit all CAD files for the final drawings on CD-ROM or DVD disks in AutoCAD 2010 format. Drawing files must be full files, uncompressed and unzipped.

1.9.1 Design Drawings Used as Shop Drawings

Design drawings may be prepared more like shop drawings to minimize construction submittals after final design is approved. If the Contractor chooses or is required to include the construction submittal information on the design documents, indicate proprietary information on the design drawings as necessary to describe the products, materials, or systems that

are to be used on the project. Construction submittal information included directly in the design drawings must be approved by the DOR. All design documents must be professionally signed in accordance with FC 1-300-09N, Navy and Marine Corps Design Procedures.

1.9.2 Drawing Format For Design Drawings Used as Shop Drawings

The Contractor-originated drawings will be used as the basis for the record drawings. Shop drawings included as design documents must comply with the same drawing requirements such as drawing form, sheet size, layering, lettering, and title block used in design drawings.

1.9.3 Identification of Design Drawings Used as Shop Drawings

The Contractor's transmittal letter and submittal register must indicate which design drawings are being submitted as shop drawings.

1.9.4 Naval Facilities (NAVFAC) Engineering Command Drawing Numbers

Number the final Contractor-originated design drawings consecutively with NAVFAC drawing numbers. Determine the total number of sheets required for the complete set of drawings before requesting the NAVFAC drawing numbers from the Contracting Officer.

1.9.5 Seals and Signatures on Documents

All final Contractor-originated design drawings must be signed, dated, and bear the seal of the registered architect or the registered engineer of the respective discipline in accordance with FC 1-300-09N. This seal must be the seal of the Designer of Record for that drawing, and who is professionally registered for work in that discipline. A principal or authorized licensed or certified employee must electronically sign and date final drawings and cover sheet, in accordance with FC 1-300-09N. The design drawing coversheets must be sealed and signed by the lead licensed architect or engineer of the project design team. Indicate the Contractor's company name and address on the drawing coversheets of each design submittal. Application of the electronic seal and signature accepts responsibility for the work shown thereon.

1.9.6 Units of Measure

Utilize English Inch-Pound units of measure on the design documents

1.10 BUILDING INFORMATION MANAGEMENT/MODELING (BIM)

Include BIM submittals as required by and complying with FC 1-300-09N:

a. BIM Project Execution Plan (PxP)

b. Design Model

c. Visual Review Report

d. Clash Detection Report

e. Record Model (With Record Documents)

1.11 SPECIFICATIONS

Provide a Contractor-originated design specification that in conjunction with the drawings, demonstrates compliance with requirements of the RFP. The specified products, materials, systems, and equipment that are approved by the DOR; submitted to the Government by the Contractor; and reviewed by the Contracting Officer must be used to construct the project. UFGS sections contained in RFP Part 2 become a part of the Contractor-originated Division 01 specification without modification. Specification Sections contained in RFP Part 5 become a part of the Contractor-originated specification without modification.

1.11.1 Specifications Components and Format

The Contractor must prepare design specifications that include a UFGS specification for each product, material, or system on the project. If the Contractor chooses or is required above to combine design and construction submittal information on the design documents, provide a UFGS specification and also proprietary information such as catalog cuts and manufacturers data that demonstrates compliance with the RFP. Organize the specifications using Construction Specification Institute (CSI) Masterformat ™ unless the Contracting Officer requires a Uniformat organization. Navy's use of system specifications takes precedence over CSI Masterformat component breakdown and related component specifications. Provide project specifications to include the following:

a. Provide the specification cover sheet with the professional seal and signature of the lead licensed architect or engineer of the project design team. Indicate the Contractor's company name and address on the specification coversheet.

b. Table of contents for entire specification.

c. Individual UFGS specification sections for each product, material, and system required by the RFP. Edit UFGS sections in accordance with RFP Part 4, PTS Section Z-10, Design Submittals.

d. If proprietary information is provided or required, include a coversheets for the product, material, or system information that is being proprietarily specified. This information is to follow the related UFGS specification.

e. If proprietary information is provided or required, include highlighted and annotated Catalog Cuts, Manufacturer's Product Data, Tests, Certificates, Manufactures information and letters for each product, material, or system that is being proprietary specified.

f. Coordinated submittal register for all products, materials and systems with each design submittal. Provide a cumulative register that identifies the design and construction submittals required by each design package along with previous design submittals. The DOR must assist in developing the submittal register by determining which submittal items are required to be approved by the DOR. Complete all fields in the final submittal register in order to obtain Government approval of the final design. Submittal register to include separate but simultaneous delivery and approval of design or data required to fulfill sustainability requirements by Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD.

1.11.2 Specifications Section Source Priority

Choose UFGS sections that describe the products, materials, and systems that are used on the project. Use current UFGS sections that are available on the Whole Building Design Guide website (available at this website: http://www.wbdg.org/references/pa_dod.php) and give priority to the Unified Tri-Service UFGS sections (no spec number suffix) and UFGS that are prepared by NAVFAC (.00 20 suffix). Only use a UFGS section prepared by another DoD Component (.00 10, and .00 30 suffix), if an applicable NAVFAC prepared specification section does not exist. Do not use Army (.00 10 suffix) and NASA (.00 40 suffix) electrical and mechanical specifications. If no applicable UFGS technical specification exists to meet your project requirements, consult with the NAVFAC Component for guidance and create a new UFGS specification in accordance with UFC 1-300-02, Unified Facilities Guide Specifications (UFGS) Format Standard.

1.11.3 Fire Protection Specifications

Specifications pertaining to spray-applied fire proofing and fire stopping, exterior fire alarm reporting systems, interior fire alarm and detection systems, and fire suppression systems, including fire pumps and standpipe systems must be either prepared by, or reviewed and approved by the Fire Protection DOR.

1.11.4 Identification of Manufacturer's Product Data Used with Specifications

Provide complete and legible catalog cut sheets, product data, installation instructions, operation and maintenance instructions, warranty, and certifications for products and equipment for which final material and equipment choices have been made. Indicate, by prominent notation, each product that is being submitted including optional manufacturer's features, and indicate where the product data shows compliance with the RFP.

Coordinate with Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI) for Contractor's eOMSI responsibilities.

1.11.5 Specification Software

Submit the final specification source files in either MS Word or SpecsIntact.

1.12 BASIS OF DESIGN

Prepare, organize, and present basis of design in accordance with the requirements of FC 1-300-09N. The basis of design must be a presentation of facts to demonstrate the concept of the project is fully understood and the design is based on sound engineering principles. Provide design analyses for each discipline and include the following:

a. Basis of design that includes:

(1) An introductory description of the project concepts that addresses the salient points of the design;

(2) An orderly and comprehensive documentation of criteria and rationale for system selection; and

(3) The identification of any necessary licenses and permits that are anticipated to be required as a part of the design or construction process.

b. Code and criteria search must identify all applicable codes and criteria and highlight specific requirements within these codes and criteria for critical issues in the facility design.

c. Calculations as specified and as needed to support this design.

d. Sustainability Notebook: Analysis and calculations relative to sustainable design requirements. Refer to Section 01 33 29.05 20, SUSTAINABILITY REPORTING FOR DESIGN-BUILD and FC 1-300-09N for requirements.

e. Draft and Final NAVFAC Sustainable and Energy Data Record Card (NSEDRC) that documents the energy usage and sustainable features of the building. Refer to RECORD DOCUMENTS paragraphs in this section for requirements.

f. Provide an exterior enclosure vapor pressure analysis, hygrothermal analysis, and written/graphic descriptions for each unique wall and roof assembly used as part of exterior enclosure barriers.

g. Section titled "Antiterrorism" that documents the antiterrorism features

h. Fall Protection Analysis

i. Draft and Interim DD Form 1354 that document the real property assets of the project. Refer to RECORD DOCUMENTS paragraphs in this section for requirements.

j. eOMSI Facility Data Workbook (FDW)

k. BIM PxP

1.12.1 Basis of Design Format

The basis of design for each design discipline must include a cover page indicating the project title and locations, contract number, table of contents, tabbed separations for quick reference, and bound in separate volumes for each design discipline.

1.12.2 Design Calculations

Place the signature and seal of the designer responsible for the work on the cover page of the calculations for the respective design discipline.

1.12.3 Historic Preservation and Planning Commission Submission

Prepare the presentation materials required to obtain approval from the Historic Preservation and Planning Commissions having jurisdiction over the site location. The submission of the materials to the agencies will be accomplished by the Government. Consult with the NAVFAC Region Historic Preservation Officer and prepare a submittal in accordance with the 36 CFR 800.11, DOCUMENT STANDARDS. The Contractor is responsible for preparing the submittal package, presenting the project in public meeting, if called upon by the Government; and to modify the submittal and contract documents to incorporate the comments of the agencies having jurisdiction to obtain

project approval.

1.12.4 Fall Protection Analysis

Eliminate fall hazards in the facility or if not feasible provide control measures to protect personnel conducting maintenance work after completion of the project. Identify fall hazards in the Basis of Design with the Design Development and Prefinal submittals. The analysis must describe how fall hazards are considered, eliminated, prevented or controlled to prevent maintenance personnel from exposure to fall hazards while performing work at heights. Refer to RFP Part 2, Section 01 35 26.05 20, GOVERNMENT SAFETY REQUIREMENTS FOR DESIGN-BUILD for fall hazard protection requirements.

1.13 RECORD DOCUMENTS

1.13.1 Record Drawings

The as-built modifications must be accomplished by electronic drafting methods on the Contractor-originated. DWG design drawings to create a complete set of record drawings. In addition to the requirements of FAC 5252.236-9310, RECORD DRAWINGS, survey the horizontal and vertical location of all provided underground utilities to within 0.1 feet relative to the station datum. All pipe utilities must be surveyed at each fitting and every 100 LF of run length. Electrical and communication ductbank, direct buried conduit, and direct buried conductor must be surveyed every 100 LF and at each change of direction. Record locations and elevations on the Record Drawings.

a. For each record drawing, provide CAD drawing identical to signed Contractor-originated.PDF drawings, that incorporates modifications to the as-built conditions. In addition, copy initials and dates from the Contracting Officer approved .PDF documents to the title block of the record CAD.DWG drawings. The RFP reference or definitive drawings are not required for inclusion in the record set of drawings.

b. After all as-built conditions are recorded on the CAD.DWG files, produce a PDF file of each individual record drawing in conformance with FC 1-300-09N. Electronic signatures are not required on record drawings.

c. Provide a searchable electronic copy of the photo documentation used in the QC Daily Reports. Refer to Section 01 45 00.05 20, DESIGN AND CONSTRUCTION QUALITY CONTROL.

1.13.2 Source Documents

Provide the specifications, basis of design, reports, surveys, record model, calculations, and any other contracted documents on the CD-ROM or DVD disk with the record drawings.

1.13.3 DD Form 1354

Prepare a Draft and Interim DD Form 1354, TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY, in accordance with UFC 1-300-08. All assets must be broken out by construction categories that are found in the DD Form 1391 and the "Category Codes for Military Real Property" from NAVFAC P-72. Use Navy specific Facility Catcodes from the NAVFAC P-72, which are available from the Contracting Officer. Coordinate the identification of appropriate asset construction categories with the Contracting Officer and the Real

Property Accounting Officer.

a. Draft DD Form 1354. DOR must determine applicable real property assets broken out by construction categories and submit a "Draft DD Form 1354" for Government approval as a part of the Basis of Design included with the Prefinal Design submittal. "Draft DD Form 1354" must include all quantities and units of measure, but does not require cost breakdown. Download the current blank editable DD Form 1354 in ADOBE (PDF) from the following website: http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf

b. Interim DD Form 1354. Contractor must coordinate with the DOR and update the Draft DD Form 1354 submission to include any additional assets, improvements, or alterations that occurred during construction. Use the Draft DD Form 1354 and the Section 01 20 00.05 20, PRICE AND PAYMENT PROCEDURES to identify costs. Submit Interim DD Form 1354 to the Government for approval 60 days prior to the Beneficial Occupancy Date (BOD). If modifications to the Interim DD Form 1354 are required by the Government, the corrected version must be submitted prior to the BOD.

Coordinate with Section 01 20 00.05 20, PRICE AND PAYMENT PROCEDURES for construction categories and associated category codes. The Contractor's Schedule of Prices must allocate the total cost of construction to the appropriate category codes.

When documenting demolition work, the DD Form 1354 must list the quantitative data associated with this work as a negative value to show the cost should be deleted from the Navy asset data store. Coordinate with the Installation Real Property POC to assist in determining the negative value for demolition work.

1.13.4 Record Model

Provide Record Model in accordance with FC 1-300-09N.

PART 2 PRODUCTS

2.1 CONSOLIDATED RFP DOCUMENTS

Within four weeksafter contract award, provide three electronic and hard copies of consolidated RFP documents incorporating the Contractor's Proposal and all RFP amendments and revisions that are contained in the contract award. Identify the changes to the RFP with the "Red-lining" or "Track Changes" feature of SpecsIntact or MS Word to highlight the pre-award modifications to the contract. Identify the amendment source at each addition and deletion by annotation, such as footnote or reference in parenthesis.

2.2 DESIGN SUBMITTALS

Complete the Contractor-originated design submittals as defined by this contract, and coordinate with the approved design network analysis schedule.

Refer to Section 01 33 29.05 20, SUSTAINABILITY REPORTING FOR DESIGN-BUILD for sustainable design submittals.

2.2.1 Design Submittal Packages

The Government prefers to review for Quality Assurance (QA) as few submittal packages as possible. Site and Building Design Submittal Packages are required, however Critical Path Design Submittals are acceptable if they are substantiated as having an impact to the critical path in the Government approved Network Analysis Schedule. A Critical Path submittal must include all design analyses, drawings, specifications and product data required to fully describe the project element for Government review.

Examples of project elements that may be submitted as Critical Path Design Submittal Packages are: Master Plan Design, Demolition Design, Foundation Design, Structural Design, Building Enclosure Design, Remaining Work Design, Furniture/Equipment Design, long lead items, or any other construction activity or project element that can be organized into a submittal package that can be reviewed and approved by the Government without being contingent upon subsequent design submittals.

2.2.1.1 Site Design

The Site Design typically includes the following components:

a. Master Site Plan

b. Demolition

c. Site work including Environmental

d. Geotechnical

2.2.1.2 Building Design

The Building Design typically includes the following components:

a. Foundation

b. Structural

c. Building Enclosures

d. Remaining Work

e. Furniture/Equipment

2.2.2 Required Design Submittals

Provide the following Design Submittal packages. Provide comprehensive, multi-discipline design packages that include design documentation for project elements, fully developed to the design stage indicated, and in accordance with FC 1-300-09N, except where specified otherwise.

a. Concept Design

b. Design Development in-progress, - Government Progress QA. 21 calendar day Government review time.

c. Prefinal (100 percent) Design - Government Progress QA. 21 calendar day Government review time.

d. Final Design - Government QA. 21 calendar day Government review time for submittals requiring Government approval prior to construction.

2.2.3 Critical Path Design Submittals

Provide Critical Path Design Submittals that include design documents for the project elements involved. Include and provide full documentation that would normally have been provided in earlier submittal stages, such as Design Development Phase.

a. 100 percent (Prefinal) Design - Government Progress QA. 21 calendar day Government review time.

b. Final Design - Government QA. 21 calendar day Government review time for submittals requiring Government approval prior to construction.

2.2.4 Review Copies of Design Submittal Packages

a. Provide bound copies of each design submittal package for review to the following reviewers. Addresses for mailing will be furnished at the PAK meeting.

(1) 8 paper copies to the NAVFAC component and 1 electronic copies of the Final submittals.

b. Provide the same quantities of copies for resubmittals, as required for each design submittal.

2.2.5 Design Submittal Review Schedule

Use the time frames for Government submittal review identified in the RFP. For construction scheduling purposes add additional time to the identified minimum review time periods to allow for the following scheduling conditions:

(1) Submittals received after noon will be logged in on the following business day.

(2) Federal holidays, including the period between Christmas and New Years Day, will be considered non-working days for Government personnel in reviewing design submittals and attending design related meetings.

(3) Postpone delivery if Government personnel to receive the submittal are unavailable. Assure in advance of the submittal delivery it can be received.

(4) Postpone delivery when heightened security restricts access to the Base. Coordinate heightened security requirements in advance with the CM.

(5) Period of review for a resubmittal is the same as the initial submittal. Review time for resubmittals caused by non-conformance, do not result in a change in contract duration or cost.

2.2.6 Distribution of Approved Final Design Drawings and Specification to Government Representatives

Submit within 14 calendar days of receiving the Government Approved Final Design Documents, which includes any Critical Path Final Design Document Packages, electronic and hardcopy(s) of these final documents to Government representatives for use during the construction of the project. If Critical Path Submittal Packages are used, provide coversheets and index to identify each sheet and how this Critical Path Submittal Package fits into the overall project. Provide the number and type of copies of the final design documents to the following Government representative:

a. Two electronic and two hard copy(s) to the Project Manager (name, address, and phone number)

b. One electronic and two hard copy(s) to the Design Manager

c. One electronic and two hard copy(s) to the Construction Manager

2.3 IDENTIFICATION OF DESIGN SUBMITTALS

Provide a title sheet to clearly identify each submittal, the completion status, and the date. The title sheet must use the standard format indicated in the FC 1-300-09N for title sheets. The title sheet must be unique to a particular design submittal. Submit the project title sheet with design status and date for the design submittals.

2.3.1 Critical Path Submittal Title Sheet

Identify Critical Path submittals as such and include a title sheet indicating the type of critical path submittal, the level of completion of the individual drawings, and which drawings are approved for construction.

2.3.2 Construction Document Validation

All CAD design documents used to construct the facility must bear a visible and legible AutoCAD generated plotstamp in the lower right hand margin of each drawing. The plotstamp information on the jobsite construction documents must match the plotstamp information contained on the following development stages of the design documents:

a. The Final Critical Path Submittal or the Final Design Submittal professionally signed by the DOR and submitted for Government approval.

b. The Final Critical Path Submittal or the Final Design Submittal drawings that have approved by the Government. This development stage may be combined with "c." below, if issued at the same time.

c. The Final Critical Path or Final Design drawings that have been included in the contract by modification.

d. The Final Critical Path or Final Design drawings which include subsequent revisions to the design documents that have been included in the contract by modifications.

Issue new drawings for construction which bear the current plotstamp once a new development stage of the design documents has been accomplished.

Design documents which do not bear a plotstamp that matches the corresponding plotstamp exhibited on the design documents described above, are not allowed to be used for the construction of the project. The plotstamp must bear the date and time of the plot, at a minimum. Maintain a plotstamp record at the jobsite that lists the applicable plotstamp information for each drawing through each stage of development described above.

PART 3 EXECUTION

3.1 CONTRACTOR'S RESOLUTION OF COMMENTS

Provide written responses to all written comments by the Government. Resubmittal of an unacceptable design submittal must be a complete package that includes all the required, specified components of that design submittal. When required by the Government, Contractor resubmittal of design package, due to nonconformance to the contract, is not a delay in the contract.

3.2 DESIGN CHANGE AND VARIATIONS

A design change is when the design is revised from what was reviewed by the Government during any phase of the design process prior to Government approval of the Final Design. A variation is any portion of the design that differs from the requirements of the solicitation, accepted proposal, or final design after Government approval of the Final Design. Design changes and variations require Government approval and only variations that are advantageous to the Government will be considered. Refer to Section 01 33 00.05 20, CONSTRUCTION SUBMITTAL PROCEDURES for further explanation and requirements of design change and variation.

The Contractor must immediately notify the Government of all potential design changes and variations via a Request for Information (RFI) to the Contracting Officer. Design changes or variations that the Contractor asserts will require a contract modification to adjust the cost/price or schedule are not allowed to be incorporated in the design during any phase of the design process without prior documented approval from the Contracting Officer. Contractors will not receive compensation for any unauthorized design changes or variations which have been included in the Government approved Final Design. Include the following information in the design change and variation RFIs:

a. Indicate the RFP Parts, sections, and paragraphs affected by this design change or variation,

b. The scope of work of the design change or variation,

c. The reason for the proposed change,

d. Explanations of how the variation is advantageous to the Government.

d. Indicate which upcoming design submittal will be affected by the subject design change,

e. Explanation of contract cost/price and schedule impacts or provide an affirmative statement indicating that the design change or variation will not have an impact on the contract cost/price or schedule.

f. Coordination measures proposed to incorporate the design change or

variation into the construction.

g. Upon request by the Contracting Officer, submit a cost proposal prepared using the Uniformat Work Breakdown Structure for all design changes and variations that have cost or schedule impacts. Submit a proposal that provides cost breakdown of each Uniformat system or subsystem that is applicable to the design change or variation. Utilize the units of measure indicated in the Uniformat Structure at the NAVFAC DB RFP website, http://www.wbdg.org/ndbm/uniformat.php.

3.3 THE CONTRACT AND ORDER OF PRECEDENCE

3.3.1 Contract Components

The contract consists of the solicitation, the approved proposal, and the final design.

3.3.2 Order of Precedence

NFAS Clause 5252.236-9312. In the event of conflict or inconsistency between any of the below described portions of the conformed contract, precedence must be given in the following order:

a. Any portions of the proposal or final design that exceed the requirements of the solicitation.

(1) Any portion of the proposal that exceeds the final design.

(2) Any portion of the final design that exceeds the proposal.

(3) Where portions within either the proposal or the final design conflict, the portion that most exceeds the requirements of the solicitation has precedence.

b. The requirements of the solicitation, in descending order of precedence:

(1) Standard Form 1442, Price Schedule, and Davis Bacon Wage Rates.

(2) Part 1 - Contract Clauses.

(3) Part 2 - General Requirements.

(4) Part 3 - Project Program Requirements.

(5) Part 6 - Attachments (excluding Concept Drawings).

(6) Part 5 - Prescriptive Specifications exclusive of performance specifications.

(7) Part 4 - Performance Specifications exclusive of prescriptive specifications.

(8) Part 6 - Attachments (Concept Drawings).

3.3.2.1 Government Review or Approval

Government review or approval of any portion of the proposal or final design does not relieve the Contractor from responsibility for errors or

omissions with respect thereto.

-- End of Section --

SECTION 01 33 29.05 20

SUSTAINABILITY REPORTING FOR DESIGN-BUILD
09/15

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 HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 55	(2010; Errata) Thermal Environmental Conditions for Human Occupancy
ASHRAE 62.1	(2010; Errata 2011; INT 3 2012; INT 4 2012; INT 5 2013) Ventilation for Acceptable Indoor Air Quality
ASHRAE 90.1 - IP	(2010; ERTA 2011-2014; Thru INT 24 2015) Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE 189.1	(2014; Errata 1-2 2015;) Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

ANSI/SMACNA 008	(2007) IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014) Navy and Marine Corps Design Procedures

U.S. DEPARTMENT OF ENERGY (DOE)

ISWG Guiding Principles	(2008) High Performance and Sustainable Buildings Guidance

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED GBDC Ref Guide	(2009; R 2010) LEED Reference Guide for Green Building Design, Construction and Major Renovations of Commercial and Institutional Buildings including Core & Shell and K-12 Projects

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

40 CFR 247	Comprehensive Procurement Guideline for

Products Containing Recovered Materials

U.S. DEPARTMENT OF AGRICULTURE (USDA)

USDA Biopreferred Program	United States Department of Agriculture's Biopreferred Program

1.2 SUMMARY

This specification includes general requirements and procedures for projects to be designed, constructed, and documented per the federally mandated "Guiding Principles" (GP), Third Party Certification (TPC) requirements (if applicable), UFC 1-200-02 High Performance and Sustainable Building Requirements, and other requirements identified in this specification.

1.3 SUBMITTALS

Submittals requirements are specified in the technical sections using Submittal Description (SD) numbers and titles. Submittals requiring Government approval use a "G" or submittal designator in the UFGS sections. In addition, submit the GPVand TPC-required sustainability documentation in this specification as "S" submittals. Submittals not having a "G" designation are for Contractor Quality Control approval.

Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with the requirements of this Section.

Government approval is required for submittals in RFP Part 2 with a "G" designation Additional construction submittals reserved for Government approval are listed in the Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES. Submittals with a "G" designation found in the sections used by the Contractor to create construction specification, require DOR approval. DOR approved submittals are also listed in the "Construction Submittals" paragraph in each RFP PART 4, Performance Technical Specifications. Provide required certification or validation submittals in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES, Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES, FC 1-300-09N, Navy and Marine Corps Design Procedures, and as identified below.

SD-01 Preconstruction Submittals

Preliminary Sustainability Notebook; G

Preliminary High Performance and Sustainable Building Checklist; G

SD-05 Design Data

Final Design Sustainability Notebook; G

Final Design High Performance and Sustainable Building Checklist; G

SD-07 Certificates

Third Party Certification (TPC)

SD-11 Closeout Submittals

Final Sustainability Notebook; G

Final High Performance and Sustainable Building Checklist; G

Amended Final Sustainability Notebook; G

Third Party Certification Plaque and Certificates; G

1.4 GUIDING PRINCIPLES VALIDATION (GPV)

NOTE:
1. GUIDING PRINCIPLES VALIDATION (GPV) applies to all building projects (vertical construction) in accordance with UFC 1-200-02 High Performance and Sustainable Building Requirements.

2. Only GPV (which includes at a minimum HPSB Checklist and initial Sustainability Action Plan) is required for the following types of projects:

a. New construction or renovation projects that require a very limited number of construction trades. Examples include: interior painting, replacing floor material, repairing roofs, or resurfacing parking lot.

b. Renovation projects less than $2.5 Million.

Provide sustainability documentation to verify achievement of ISWG Guiding Principles Validation (GPV).

Provide the following for GPV:

a. Refer to Attachment 1, HPSB Checklist at the end of this specification section.

b. Obtain approval of the HPSB Checklist from the Contracting Officer at the Post Award Kick-Off Meetings. Contracting Officer's approval establishes identified ISWG Guiding Principles Requirements as the project's sustainability goals.

No variations or substitutions to the HPSB Checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any project changes that impact meeting the approved ISWG Guiding Principles Requirements for this project and Contractor must demonstrate that change will not incur additional construction cost or increase the life cycle cost.

c. Include all work required to incorporate the applicable ISWG Guiding Principles Requirements indicated on the HPSB Checklist and in this contract.

d. Include design and construction related documentation to maintain an up-to-date Sustainability Notebook. Supplement design and construction related documentation containing the following components;

(1) HPSB Checklist

(2) Sustainability Action Plan

(3) Documentation illustrating Guiding Principle Requirements compliance

(4) Commissioning Plan and Reports

1.4.1 Sustainability Action Plan

Include the following information in the Sustainability Action Plan;

a. Contractor's planned method to achieve each GP requirement.

b. For each designated ISWG Guiding Principles Requirement that is not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

c. Name and contact information for: Contractor's POC ensuring sustainability goals are accomplished and documentation is assembled.

1.4.2 Costs

Contractor is responsible for all costs associated with designing, constructing and demonstrating that project complies with approved ISWG Guiding Principles Requirements.

1.4.3 Calculations

Provide all design data, calculations, product data, and certifications required in this specification to demonstrate compliance with the ISWG Guiding Principles Requirements.

1.4.4 Third Party Certification (TPC) Documentation

Register and meet all requirements, and certify to achieve Third Party Certification (TPC) level of LEED GBDC Ref Guide Silver as indicated in each task order . Third Party Certification is met when Government receives TPC organization certificate and plaque.

Third Party Certification requirements are in addition to all requirements under header above GUIDING PRINCIPLES VALIDATION (GPV).

Register project with TPC organization using the following format and content:

a. Project Title First Line: US Army, US Air Force, US Navy or US Marine Corps, Building Name (if known)

b. Project Title Second Line: MILCON P#, DD1391 Project Name

c. Project Address: UIC (Installation code), Category code, RPUID (Real Property Unique Identifier) Number

d. Project Owner Organization: US Army, US Air Force, US Navy or US Marine Corps

e. Primary Contact, Owner: Agency Project Manager

f. Additional Contact, Building Owner: Public Works Officer or Designee

The TPC Certification requires the following:

a. Refer to Attachment 2, TPC Checklist at the end of this specification section.

b. Obtain approval of the TPC Checklist from the Contracting Officer at the Post Award Kick-Off Meetings. Contracting Officer's approval establishes identified TPC Requirements as the project's sustainability goals.

No variations or substitutions to the TPC Checklist are allowed without written consent from the Contracting Officer. Immediately bring to the attention of the Contracting Officer any project changes that impact meeting the approved TPC Requirements for this project. Demonstrate that change will not: incur additional construction cost; increase the life cycle cost; or impact achieving required TPC certification level.

c. Complete all design and construction work to incorporate the applicable TPC Requirements.

d. Maintain the design and construction related information, and provide replacement pages, in the Sustainability Notebook pertaining to additions and changes to the approved sustainability requirements. The Sustainability Notebook is in electronic format and is explained in the paragraph SUSTAINABILITY NOTEBOOK. The Sustainability Notebook contains the following components in addition to the GPV requirements under header above GUIDING PRINCIPLES VALIDATION (GPV):

(1) TPC Checklist

(2) Completed TPC Online forms for each identified prerequisite and credit. Upload onto the TPC Online documentation website.

(3) Copy of all correspondence with the TPC organization. Provide proof of TPC registration.

(4) Documentation illustrating compliance with TPC requirements

(5) TPC Award Certificate

e. Include the following information in the Sustainability Action Plan. Provide this TPC information in addition to the GPV Action Plan items above:

(1) Contractor's planned method to achieve each TPC requirement.

(2) For each of the TPC credit that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

(3) Names and contact information for: Contractor sustainability POC and other names of sustainability professionals on the Contractor's Staff responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled.

(4) Provide the plan and schedule for performance testing, data collection, and commissioning

f. Contractor is responsible for all costs associated with designing,

constructing, and demonstrating that project complies with approved TPC requirements, including but not limited to:

(1) Registration, review, certification and plaque fees.

(2) Online (or offline with secure facilities) TPC management and documentation.

(3) Obtaining TPC certification based on Government-approved sustainability goals.

(4) Design and construction work required to incorporate TPC prerequisites and credits.

(5) Submittals required to demonstrate compliance with Government approved TPC checklists.

g. Provide all design data, calculations, product data, and certifications required in this specification to demonstrate compliance with the TPC Requirements.

h. Provide all online (or offline, with secure facilities) TPC management and documentation.

i. Provide all required responses to TPC.

j. Provide TPC Plaque and Certificates. Use the following format to create the Plaque, Certificate, and Letter of Congratulations. Forward to parties designated by Contracting Officer:

(1) Plaque

Name: Final Building Name. If unknown, use the Form DD1391 Project Name.

(2) Certificate

Project title, first line: P-(X); (1391 Project Name). Project title, second line: UIC (installation code)

(3) Letter of Congratulation

Address letter to the Facility's Installation Commander Name. Address the letter to an individual person.

1.5 SUSTAINABILITY SUBMITTALS

Provide documentation in the Sustainability Notebook and the HPSB Checklist to indicate compliance with the sustainability requirements of the project.

1.5.1 High Performance Sustainable Building (HPSB) Checklist

Provide documentation that provides proof of and supports compliance with the completed HBSP Checklist. Prepopulated HPSB checklist may be obtained from the Government Project Manager.

1.5.1.1 HPSB Checklist Submittals

Submit updated HPSB Checklist with each Sustainability Notebook submittal.

Attach final HPSB Checklist to DD1354 Real Property Record Submittal.

1.5.1.2 HPSB Checklist Public Access

The Checklist form is found at the following link; http://www.wbdg.org/pdfs/navfac_sustainable_energy_data_record_card.pdf . Use the bookmarked New Construction & Major Renovation form for new construction and major renovation, and use the Minor Construction form for minor construction under $2.5M.

1.5.2 "S" Submittals for Sustainability Documentation

Submit the GPV and TPC sustainability documentation required in this specification as "S" submittals. Highlight GPV and TPC compliance data in "S" submittal.

1.5.3 Sustainability Notebook

Prepare and maintain a comprehensive Sustainability Notebook to document compliance with the sustainability requirements identified in the approved HPSB and TPC Checklists. Sustainability Notebook must contain all required data to support full compliance with the ISWG Guiding Principles Requirements and TPC requirements. Sustainability Notebook is in the form of an Adobe PDF file; bookmarked at each ISWG Guiding Principles Requirement, TPC requirement,and sub-bookmarked at each document. Match format to ISWG Guiding Principles numbering system indicated herein. Maintain up to date information, spreadsheets, templates, etc. with each current submittals. For TPC projects, provide a second Table of contents using TPC numbering system. Locate documentation unique to TPC here. Where TPC documentation would repeat GP documentation, insert note referring reviewer to GP documentation.

Contracting Officer may deduct from the monthly progress payment accordingly if Sustainability Notebook information is not current, until information is updated and on track per project goals.

1.5.3.1 Sustainability Notebook Submittal Schedule

Provide Sustainability Notebook Submittals at the following milestones of the project:

a. Preliminary Sustainability Notebook

Submit preliminary Sustainability Notebook for approval at the Post Award Kick-Off Meetings. Include Preliminary High Performance and Sustainable Building Checklist.

b. Final Design Sustainability Notebook

Submit updated Sustainability Notebook no later than 60 days after final design complete submission. Review Sustainability Notebook and TPC Online submission for completeness of design requirements, prerequisites, and credits documentation and appropriate progress toward construction requirements, prerequisites, and credits documentation. Identify any outstanding issues relating to achieving the sustainability goals of the project and incomplete documentation requirements. Obtain DOR approval and submit three (3) electronic copies of the Final Design Sustainability Notebook on DVDs to the Government. Include Final Design High Performance and Sustainable

Building Checklist.

c. Construction Progress Meetings.

Update GP and TPC documentation in the Sustainability Notebook and TPC Online tool for each meeting.

d. Final Sustainability Notebook

Submit updated Sustainability Notebook within 60 days after the Beneficial Occupancy Date (BOD). Final progress payment retainage may be held by Contracting Officer until Final Sustainability construction phase documentation is complete. Obtain DOR approval and submit three (3) electronic copies of the Final Sustainability Notebook on DVDs to the Government. Include Final High Performance and Sustainable Building Checklist.

e. Amended Final Sustainability Notebook

Amend and resubmit the Final Sustainability Notebook to include commissioning, testing and balancing, and collection of performance requirements. Obtain prior DOR approval and submit three (3) final electronic copies of the Amended Final Sustainability Notebook Submittal on DVDs to the Government no longer than 30 days after the GP, TPC, and Cx designated data collection period.

1.6 DOCUMENTATION REQUIREMENTS

Third Party Certification requirements or credits are mandatory when they have requirements that match a Guiding Principle Requirement. Documentation used to demonstrate TPC compliance may be used to demonstrate GP compliance.

Incorporate each of the following ISWG Guiding Principles Requirements into project and provide documentation that proves compliance with each listed requirement. Items below are organized according to the ISWG Guiding Principles.

For projects that require TPC, refer to Third Party Certifier's reference manuals for TPC requirements.

A life cycle cost analysis is required for all energy and water-related Guiding Principles, and others as required below. One document with all assessments is acceptable with Contracting Officer approval.

1.6.1 Integrated Design Process

Use a collaborative, integrated planning and design process. For the submittal documentation below, use the Integrated Building Design process as described in ASHRAE Handbook - HVAC Applications, Chapter 58 (Integrated Building Design) to the maximum extent practical. This reference is applicable to all disciplines and provides a roadmap to guide design teams through the Integrated Design process. (The use of Building Information Modeling, as described in the section Tools is encouraged but not required.)

a. Design submittal documentation required;

(1) Maintain an up-to-date list of the sustainability integrated design team and their roles in all stages of a project's planning

and delivery:

(a) Contractors Sustainability Coordinators; Architecture and engineering disciplines involved on the project and the DOR in charge of the overall project and each discipline; Construction Subcontractors and the company representatives that align with each architectural and engineering discipline, Planning, Public Works, Environmental Specialist and other appropriate installation personnel.

(b) Describe their roles and responsibilities and plan-of-action for how each team member will be involved to achieve the project sustainability requirements, and how the Contractor will coordinate with Government personnel.

(2) Provide narratives and reports;

(a) Performance goals for siting, energy, water, materials, and indoor environmental quality along with other comprehensive design goals and ensures incorporation of these goals throughout the design and lifecycle of the building.

(b) Integration of the goals into design and construction.

(c) Collaboration with other providers, such as Commissioning Authority and Third Party Certification.

1.6.2 Commissioning (Cx)

Using a qualified Commissioning Authority (CxA), develop and incorporate Commissioning requirements into the construction documents. Develop and implement a Commissioning plan. Verify the installation and performance of the systems to be commissioned, including no less than: HVAC&R systems and associated controls, lighting and daylighting controls, domestic hot water systems, renewable and non-renewable energy systems. Complete a summary Commissioning report.

a. Provide construction submittal documentation required below. Coordinate with Section 01 45 00.05 20, DESIGN AND CONSTRUCTION QUALITY CONTROL.

(1) Commissioning Authority certifications.

(2) Commissioning Authority qualifications.

(3) Commissioning meeting minutes during construction.

(4) Commissioning Plan, updated at each project stage.

(5) For each commissioned system, completed pre-startup checklist, completed functional verification checklist and performance verification test report.

(6) Final Commissioning report and narrative demonstrating project's Commissioning requirements have been successfully executed.

1.6.3 Optimize Energy Performance

Meet the requirements of ASHRAE 90.1 - IP, and achieve at least 30 percent

energy efficiency below baseline, when life cycle cost effective.

a. Design submittal documentation required;

(1) Provide documentation showing total percentage of proposed building energy performance improvement over cited standards baseline.

(a) Submit calculations demonstrating project meets the energy consumption reduction (including process and receptacle loads) required.

(2) Provide life cycle cost analysis (LCCA)

b. Construction submittal documentation required;

(1) Provide revised energy modeling for actual system constructed.

1.6.4 Energy Efficient Equipment

Provide only energy-using equipment that is Energy Star or has Federal Energy Management Program (FEMP) recommended efficiency. Provide only energy using equipment that meets FEMP requirements for low standby power consumption. Energy efficient equipment can be found at: http://www1.eere.energy.gov/femp/ and http://www.energystar.gov/

a. Construction submittal documentation required;

(1) Provide proof that equipment is labeled energy efficient and complies with the cited requirements.

1.6.5 Solar Thermal Water Heating

Provide 30 percent or more of domestic hot water needs through solar thermal water heating.

a. Design submittal documentation required;

(1) Provide documentation showing total on-site renewable energy to be installed as a percentage of proposed building energy consumption.

(2) Provide life cycle cost analysis (LCCA)

1.6.6 On-site Renewable Energy Generation

Provide project energy needs thru on-site renewable energy generation.

a. Design submittal documentation required;

(1) Provide documentation showing total on-site renewable energy to be installed as a percentage of proposed building energy consumption.

(2) Provide life cycle cost analysis (LCCA)

1.6.7 Building-level Power Metering

Provide building-level meters of electricity, natural gas (and steam where applicable) use.

a. Design submittal documentation required;

(1) Provide design drawings that highlight meter locations on the site.

1.6.8 Benchmarking

Provide report of initial actual energy performance with the energy design targets.

a. Construction submittal documentation required;

(1) Provide a Prefinal Performance Report with data collected from the first 60 days of operation of the facility after Beneficial Occupancy Date (BOD). Submit this information with the Final Sustainability Notebook Submittal.

1.6.9 Water Consumption

Reduce water consumption with the use of fixtures and equipment efficiencies required by ASHRAE 189.1, Sections 6.3.2.1 and 6.3.2.2.

a. Design submittal documentation required

(1) Provide documentation showing potable water consumption is reduced by cited standard.

(2) Provide life cycle cost analysis (LCCA)

1.6.10 Building-level Water Metering

Provide building-level meters for water use.

a. Design submittal documentation required;

(1) Provide design drawings that highlight meter locations on the site.

1.6.11 Landscape Irrigation

Reduce potable water landscape irrigation by 50 percent or more.

a. Design submittal documentation required when permanent landscape irrigation is part of project;

(1) Provide documentation showing potable water consumption used for landscape irrigation is reduced by 50 percent compared to baseline case

(2) Provide life cycle cost analysis (LCCA)

1.6.12 Stormwater Management

Meet the requirements of UFC 3-210-10.

a. Design submittal documentation required

(1) Provide documentation showing storm water is managed per cited criteria.

1.6.13 Water Use for Heating and Cooling

Reduce Process Water consumption.

a. Design submittal documentation required:

(1) Provide documentation showing storm water is managed on the project site per cited criteria, and as required for reporting.

(2) Provide life cycle cost analysis (LCCA)

1.6.14 Water Conserving Fixtures

Provide only water-consuming products that are EPA WaterSense labeled, or the most efficient water fixtures available when EPA Watersense products are not available.

a. Design submittal documentation required:

(1) Provide design drawings that highlight the requirement for EPA Watersense products

(2) Provide documentation that indicates the most efficient water fixtures available, when EPA Watersense product categories are not available.

b. Construction submittal documentation required:

(1) Proof that water fixtures are efficient and comply with the cited requirements.

1.6.15 Ventilation and Thermal Comfort

Design to meet ASHRAE 189.1, Section 8.3.1 "Indoor Air Quality" 62.1 and Section 6.3.2 "Thermal Environmental Conditions for Human Occupancy".

a. Design submittal documentation required

(1) Provide documentation showing project HVAC system meets minimum requirements of Sections 4 through 7 of ASHRAE 62.1. (Documentation as described in Section 6.2 is not required), and other provisions of ASHRAE 189.1.

(2) Provide documentation showing entry mat systems and finish requirements.

(3) Provide documentation showing that HVAC systems and the building envelope have been designed to meet the requirements of ASHRAE 55 (Documentation as described in Section 6.2 is not required).

1.6.16 Moisture Control

Follow the requirements of UFC 3-101-01 "Architecture", Chapter 3 "Building Envelope."

a. Design submittal documentation required

(1) Provide design details for envelope and HVAC humidity controls.

(2) Provide plan for construction material storage and protection, humidity controls during construction, and operation and maintenance plan for ongoing building moisture control.

1.6.17 Daylighting

Achieve the minimum daylighting requirements of ASHRAE 189.1, Section 8.4.1 "Daylighting by Sidelighting" or Section 8.5.1 "Daylighting Simulation". Provide automated lighting controls.

a. Design submittal documentation required

(1) Floor plans, elevations, and calculations delineating requirements, to include compliant reflective surface locations and shading devices (where applicable).

1.6.18 Reduce Volatile Organic Compounds (VOC) (Low-Emitting Materials)

Provide materials and products with low pollutant emissions, including composite wood products, adhesives, sealants, interior paints and finishes, carpet systems, and furnishings. Meeting the requirements of ASHRAE 189.1 Sections 8.4.2 (Prescriptive Option: Materials) or Section 8.5.2 (Performance Option: Materials) demonstrates compliance. Insulation products must meet the requirements of Section 8.5.2 (Performance Option: Materials). Provide the following documentation:

a. Construction submittal documentation required

(1) Demonstrate that materials do not exceed maximum VOC emissions of cited standards. VOC averaging is allowed where coatings are subject to human contact or harsh environmental conditions.

(2) Demonstrate that flooring materials comply with VOC emissions of cited standards.

(3) Demonstrate that composite wood and agrifiber products and associated laminating adhesives contain no added urea-formaldehyde.

(4) Demonstrate that furniture and seating complies with low emissions requirements.

(5) Create and maintain a list of above listed products used on the project within the building vapor barrier. Demonstrate how product meets cited standards.

1.6.19 Indoor Air Quality During and After Construction

Prior to construction, create indoor air quality plan. Implement IAQ plan during construction & flush building air before occupancy.

a. Construction submittal documentation required

(1) For new construction and for renovation of unoccupied existing buildings, comply with ASHRAE 189.1 Section 10.3.1.4 (Indoor Air Quality (IAQ) Construction Management), with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent.For renovation of occupied existing buildings, comply with ANSI/SMACNA 008 IAQ Guidelines for Occupied Buildings Under Construction.

(2) Provide required documentation showing that after construction ends and prior to occupancy, HVAC filters were replaced and air was flushed out in accordance with ASHRAE 189.1 Section 10.4.1.4 for new construction and unoccupied buildingsANSI/SMACNA 008 for occupied buildings.

1.6.20 Environmentally Preferred Products

Use products designated for Federal procurement to meet environmentally preferred requirements.

a. Construction submittal documentation required

(1) Provide list of environmentally preferable products used on this project that meet the requirements of UFC 1-200-02.

1.6.21 Recycled Content

Provide materials on this project with aggregated total recycled content equal to or greater than 10 percent. In addition comply with 40 CFR 247. Refer to for assistance identifying products cited in 40 CFR 247.

a. Construction submittal documentation required

(1) Total amount of recycled content contained in building materials as a percentage of total cost of all building materials on the project (mechanical, electrical and plumbing components, and specialty items such as elevators excluded).

(2) Manufacturers documents stating the recycled content by material, or written justification for claiming one of the exceptions allowed under RCRA 6002.

(3) Contractor may submit for Government approval proposed alternative products or systems that provide equivalent performance and appearance and have greater contribution to project recycled content requirements. For all such proposed substitutions, submit with the Sustainability Action Plan accompanied by product data demonstrating equivalence.

1.6.22 Bio-Based Products

Utilize products and materials made from bio-based materials to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. Use only supplies and materials of a type and quality that conform to applicable specifications and standards.

Bio-based products that are designated for preferred procurement under USDA Biopreferred Program must meet the required minimum bio-based content. Refer to www.biopreferred.gov.for the product categories and BioPreferred Catalog.

a. Construction submittal documentation required

(1) For biobased products used on this project, provide biobased product content percentage and biobased source of material. Indicate name of the manufacturer, cost of each product and the

use of each product on this project.

(2) For products that meet USDA Biopreferred Program, provide documentation of USDA Biopreferred label.

1.6.23 Waste Material Management (Recycling - Design)

Provide a dedicated, easily-accessible area or areas for the collection and storage of materials for recycling for the entire building, where markets or on-site recycling exists. Collection must include, at a minimum: paper, corrugated cardboard, glass, plastics and metals.

a. Design submittal documentation required

(1) Provide documentation showing an appropriately sized and placed storage room has been dedicated for recyclables.

1.6.24 Waste Material Management (Recycling - Construction)

Divert construction debris from landfill disposal where markets or on-site recycling exists, in accordance with Section 01 74 19.05 20 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT FOR DESIGN-BUILD.

a. Construction submittal documentation

(1) Documentation showing total amount of construction debris diverted from landfill as a percentage of all construction debris on the project.

(a) Include project's Construction Waste Management Plan and all dumpster haul tickets.

1.6.25 Ozone Depleting Substances

The use of CFC-based refrigerants in HVAC&R systems is prohibited. Eliminate the use of all ozone depleting substances (CFC's, HCFCs, or Halons) during construction and in building design where alternative environmentally preferable products are available taking into account lifecycle impacts. Meet the requirements of ASHRAE 189.1 Section 9.3.3 Refrigerants for no CFC-based refrigerants in heating ventilation, air conditioning and refrigeration systems (except for fire suppression system requirements, covered elsewhere in this specification).

a. Construction submittal documentation required

(1) MSDS sheets for all refrigerants provided

(2) Use substances that meet the criteria of U.S. EPA Significant New Alternatives Policy (http://www.epa.gov/ozone/snap/index.html)

1.6.26 Validation and Certification Restrictions

The purchase of renewable energy credits (RECs) specifically to meet project sustainability goals is prohibited.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 SUSTAINABILITY COORDINATION

3.1.1 Coordinating Sustainability Documentation Progress

Provide sustainability focus and coordination at the following meetings to achieve sustainability goals. In addition to requirement below, the following meetings requirements are further described in other parts of the RFP documents. Contractor's designated TPC accredited professional responsible for GP and TPC documentation must participate in the following meetings to coordinate documentation completion:

a. Design Review Meetings: Review progress towards meeting Sustainability requirements in the Sustainability Action Plan, and completeness of Sustainability Notebook, and TPC Online submission at the following;

   (1) Post Award Kick-Off Meeting: Refer to Section 01 31 19.05 20 POST AWARD MEETINGS. Discuss the following: TPC and HPSB Checklists, Sustainability Action Plan, Design submittal and Construction submittal requirements and schedule, individuals responsible for achieving each Guiding Principle Requirement and TPC prerequisite and credit.

   (2) Design Quality Assurance Meetings: Refer to Section 01 31 19.05 20 POST AWARD MEETINGS for requirements. Discuss progress toward accomplishing Sustainability goals and obtaining sustainability documentation at each design submittal review. Refer to RFP Part 2 Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES for designated design submittals.

   (3) Design Complete Review Meetings (No later than 60 days after final design complete submission): Review HPSB Checklist, Sustainability Notebook, and TPC Online submission for completeness and identify any outstanding issues relating to final score and documentation requirements.

b. Construction Progress Meetings: Review GP and TPC sustainability requirements with project team including contractor and sub-contractor representatives. Demonstrate HPSB Checklist and TPC documentation is being collected and updated to the Sustainability Notebook and TPC Online tool.

   (1) Facility Turnover Meetings: Refer to Section 01 31 19.05 20 POST AWARD MEETINGS for further requirements. Review HPSB Checklist,Sustainability Notebook, and TPC Online submission for completeness and identify any outstanding issues relating to final documentation requirements.

   (2) Final Sustainability Notebook Review

3.2 SUSTAINABILITY AWARD

Finalize the sustainability certification process and obtain the TPC Certification Plaque and Certificates, indicating completion of the projects sustainability goals.

3.2.1 Third Party Certification Plaque and Certificates

Provide one original framed copy of the certificate, mounted in 1 inch deep metal frames, with double matt, and wire hangers, in location approved by Contracting Officer. Provide one original certificates, and deliver to Contractor Officer, unless otherwise instructed. Provide and hang Plaque in a prominent interior location approved by the Contracting Officer.

-- End of Section --

SECTION 01 35 13.05 20

SPECIAL PROJECT PROCEDURES FOR DESIGN-BUILD
11/07

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Watercraft list; G

SD-04 Samples

Model Unit; G

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 HAZARDS TO AIRFIELD or HELIPORT OPERATION

In addition to "DFARS 252.236-7005, Airfield Safety Precautions," the following paragraphs apply.

3.1.1 Work in Proximity to Runways or Landing Strips

Accomplish all construction work on the runways, landing strips, taxiways, and parking aprons and in the end zones of the runways and 75 feet to each side of the runways and taxiways the landing strip, 75 feet to each side thereof, and on the taxiways and parking aprons with extreme care regarding the operation of aircraft. Cooperate closely, and coordinate with the Operations Officer and the Contracting Officer. Park equipment in an area designated by the Contracting Officer. Under no circumstances is equipment allowed to be parked overnight or for any extended period of time in the proximity of the runways, taxiways or landing strip. Leave no material in areas where extreme care is to be taken regarding the operation of aircraft.

3.1.2 Schedule of Work/Aircraft Operating Schedules

Schedule work to conform to aircraft operating schedules. The Government will exert every effort to schedule aircraft operations so as to permit the maximum amount of time for the Contractor's activities; however, in the event of emergency, intense operational demands, adverse wind conditions, and other such unforeseen difficulties, the Contractor must discontinue operations at the specified locations in the aircraft operational area for

the safety of the Contractor and military personnel and Government property. Submit a schedule of the work to the Contracting Officer for transmittal to the Operations Officer describing the work to be accomplished; the location of the work, noting distances from the ends of runways, taxiways, landing strips and buildings and other structures as necessary; and dates and hours during which the work is to be accomplished. Keep the approved schedule of work current, and notify the Contracting Officer of any changes prior to beginning each day's work.

3.1.3 Daytime Markings

During daylight, mark stationary and mobile equipment with international orange and white checkered flags, mark the material, and work with yellow flags.

3.1.4 Nighttime Markings

During nighttime, which begins 2 hours before sundown and ends 2 hours after sunrise, mark stationary and mobile equipment and material, and work with red lanterns. Where the Operations Officer determines that the red lanterns may confuse pilots approaching for landings, the Operations Officer may direct that the red lanterns be left off or that the color of the globes be changed.

3.1.5 Excavation

Open only those trenches for which material is on hand and ready for placing therein. As soon as possible after the material has been placed and work approved, backfill and compact the trenches as specified.

3.1.6 Contractor Safety Precautions

The contractor is advised that aircraft operations will produce extremely high noise levels and will induce vibrations in pavements, structures, and equipment in the vicinity, and may result in high velocity flying debris in the area. The contractor is responsible for providing all necessary ear protective and other safety devices for his personnel, for insuring protection of his equipment, and for scheduling the work to eliminate hazards to his personnel and equipment and to prevent damage to work performed by him.

3.1.7 Radio Contact

Provide necessary battery powered portable radios, including one radio for the tower. During work within the landing area, have an operator (who speaks fluent English) available for radio contact with the tower at all times. Radio frequency must be approved by the tower.

3.2 HARBOR WATERWAYS

In addition to "DFARS 252.236-7002, Obstruction of Navigable Waterways," obtain from the Operations Officer at the Naval Base, Pearl Harbor via the Contracting Officer, permission to use Pearl Harbor waterways and the regulations and directives governing such usage. Submit a watercraft list with a description of crafts, including sizes, types, numbers and boat crew for approval.

3.2.1 Hazards to Navigation

Maintain complete control of the movement of floating equipment and material. Loose floating equipment and material are not permitted. Keep in readiness at all times a powered craft capable of moving, securing and disposing of floating equipment which may get loose and become a hazard to navigation.

3.2.2 Submarine Cables or Underwater Utilities

Physically locate submarine cables or underwater utilities as indicated prior to performance of work.

3.2.3 RIMPAC Operational Exercises

Due to the RIMPAC exercises conducted every even numbered years, the Contractor must anticipate delays and disruption in construction activities for a period of 60 consecutive calendar days during the contract. Disruption may range from complete shutdown of construction activity for a prolonged period of time or periodic short term shutdown of less than a full day, but in no event will all such shutdowns in the aggregate exceed 60 calendar days per calendar year. This affected period is anticipated between 1 April and 31 July of every even numbered year. Bidders must take into consideration such delays when preparing their bids.

3.2.4 December 7, 1941 Commemorative Ceremonies

To minimize disturbances during Pearl Harbor's December 7, 1941 Commemorative Ceremonies, the Contractor must shut down all construction activities on the day that ceremonies are held.

3.3 MODEL UNIT

Prior to placement of material orders for components of the dwelling units and the installation of those components throughout the project, the Contractor must complete the construction of the components of the model unit, and gain the approval of the Contracting Officer for the materials and workmanship therein.

3.3.1 Model Unit Description

The model unit must be made up of enough living suites consisting of two bedrooms and an interconnecting bathroom or single family housing units to show all of the different levels of completion required below. The model unit must be constructed at the location agreed upon with the Contracting Officer and a part of the permanent structure as indicated or a temporary structure constructed to full scale at the location indicated, and demolished at the completion of the contract.

3.3.2 Model Unit Requirements

The construction of the model unit must adhere to the following requirements:

a. Materials provided in model unit must be those actually approved in submittals. The QC Manager and Organization must be in place to approve and process submittals in accordance with Sections 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.

b. The Contractor must provide all temporary utilities and climate control necessary to construct, inspect, approve, and maintain the model unit.

c. Prior to completion and approval of the model unit, and with written permission to start from the Contracting Officer, the Contractor may perform general sitework and run major utility lines for the rest of the project.

3.3.3 Model Unit Levels of Completion

The completed model unit must be exhibited for approval. Upon completion, the model unit must be available to the Government for a period of fifteen (15) working days for inspection after notification is received by Contracting Officer.

-- End of Section --

SECTION 01 35 26.05 20

GOVERNMENT SAFETY REQUIREMENTS FOR DESIGN-BUILD
12/15

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 ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE A1264.1	(2007) Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace, Floor, Wall and Roof Openings; Stairs and Guardrails Systems
ASSE/SAFE Z244.1	(2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSE/SAFE Z359.2	(2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program

ASSE/SAFE Z359.3	(2007) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
ASSE/SAFE Z359.6	(2009) Specifications and Design Requirements for Active Fall Protection Systems
ASSE/SAFE Z359.7	(2011) Qualification and Verification Testing of Fall Protection Products
ASSE/SAFE Z490.1	(2009) Criteria for Accepted Practices in Safety, Health, and Environmental Training

ASME INTERNATIONAL (ASME)

ASME B30.20	(2013; INT Oct 2010 - May 2012) Below-the-Hook Lifting Devices
ASME B30.22	(2010) Articulating Boom Cranes
ASME B30.26	(2015; INT Jun 2010 - Jun 2014) Rigging Hardware
ASME B30.3	(2012) Tower Cranes
ASME B30.5	(2014) Mobile and Locomotive Cranes
ASME B30.8	(2010) Floating Cranes and Floating Derricks
ASME B30.9	(2014; INT Feb 2011 - Nov 2013) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2015) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2003) Guide for Protective Grounding of Power Lines
IEEE C2	(2012; Errata 2012; INT 1-4 2012; INT 5-7 2013; INT 8-10 2014; INT 11 2015) National Electrical Safety Code

HUMAN FACTORS AND ERGONOMICS SOCIETY

HFES 100	(2007) Human Factors Engineering of Computer Workstations

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA Z535.2	(2011) Environmental and Facility Safety Signs

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 1	(2015; ERTA 2015) Fire Code
NFPA 10	(2013) Standard for Portable Fire Extinguishers
NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction,Alteration, and Demolition Operations
NFPA 306	(2014) Standard for Control of Gas Hazards on Vessels
NFPA 51B	(2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National Electrical Code
NFPA 70E	(2015; ERTA 1 2015) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

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

10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.333	Selection and Use of Work Practices
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1915.89	Control of Hazardous Energy (Lockout/Tags-Plus)
29 CFR 1919	Gear Certification
29 CFR 1926	Safety and Health Regulations for Construction

29 CFR 1926.1400	Cranes and Derricks in Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA’s Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is 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 through provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are 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;

d. Transfer to another job;

e. Medical treatment beyond first aid;

f. Loss of consciousness; or

g. A significant injury or illness diagnosed by a physician or other

licensed health care professional, even if it did not result in (a) through (f) above.

1.2.17 USACE Property and Equipment

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

1.2.18 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document any mishap that meets the criteria described in the Contractor Significant Incident Report (CSIR) using the NAVFAC prescribed Navy Crane Center (NCC) form.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

APP - Pre-Design Submittal; G

APP - Pre-Construction Submittal; G

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Reports; G

LHE Inspection Reports

SD-07 Certificates

Contractor Safety Self-Evaluation Checklist

Crane Operators/Riggers

Standard Lift Plan; G

Critical Lift Plan ; G

Naval Architecture Analysis; G

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

Third Party Certification of Barge-Mounted Mobile Cranes

License Certificates

Radiography Operation Planning Work Sheet; G

1.4 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher.

1.5 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor at the pre-construction conference. Complete the checklist monthly and submit with each request for payment voucher. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90 may result in retention of up to 10 percent of the voucher.

1.6 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations. Submit 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 govern.

1.6.1 Subcontractor Safety Requirements

For this contract, neither Contractor nor any subcontractor may enter into contract with any subcontractor that fails to meet the following requirements. The term subcontractor in this and the following paragraphs means any entity holding a contract with the Contractor or with a subcontractor at any tier.

1.6.1.1 Experience Modification Rate (EMR)

Subcontractors on this contract must have an effective EMR less than or equal to 1.10, as computed by the National Council on Compensation

Insurance (NCCI) or if not available, as computed by the state agency's rating bureau in the state where the subcontractor is registered, when entering into a subcontract agreement with the Prime Contractor or a subcontractor at any tier. The Prime Contractor may submit a written request for additional consideration to the Contracting Officer where the specified acceptable EMR range cannot be achieved. Relaxation of the EMR range will only be considered for approval on a case-by-case basis for special conditions and must not be anticipated as tacit approval. Contractor's Site Safety and Health Officer (SSHO) must collect and maintain the certified EMR ratings for all subcontractors on the project and make them available to the Government at the Government's request.

1.6.1.2 OSHA Days Away from Work, Restricted Duty, or Job Transfer (DART) Rate

Subcontractors on this contract must have a DART rate, calculated from the most recent, complete calendar year, less than or equal to 3.4 when entering into a subcontract agreement with the Prime Contractor or a subcontractor at any tier. The OSHA Dart Rate is calculated using the following formula:

(N/EH) x 200,000

where:

N = number of injuries and illnesses with days away, restricted work, or job transfer

EH = total hours worked by all employees during most recent, complete calendar year

200,000 = base for 100 full-time equivalent workers (working 40 hours per week, 50 weeks per year)

The Prime Contractor may submit a written request for additional consideration to the Contracting Officer where the specified acceptable OSHA Dart rate range cannot be achieved for a particular subcontractor. Relaxation of the OSHA DART rate range will only be considered for approval on a case-by-case basis for special conditions and must not be anticipated as tacit approval. Contractor's Site Safety and Health Officer (SSHO) must collect and maintain self-certified OSHA DART rates for all subcontractors on the project and make them available to the Government at the Government's request.

1.7 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.7.1 Personnel Qualifications

1.7.1.1 Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate 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 and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all

associated sub-paragraphs. The SSHO shall meet either one of the following minimum level requirements as indicated in each task order:

Level 1:
The SSHO is required to have a minimum of 5 years of construction industry safety experience on similar projects. Complete the 30-hour OSHA construction safety class or equivalent within the last 5 years. Complete an average of at least 24 hours of formal safety training each year for the past 5 years. Complete the 40-hour Construction Hazard Awareness Course. Achieve certification as a Safety Trained Supervisor (STS). Competent person training as needed.

Level 2:
The SSHO is required to have a minimum of 5 years of construction industry safety experience on similar projects. 30-hour OSHA construction safety class or equivalent within the last 5 years. An average of at least 24 hours of formal safety training each year for the past 5 years with training for competent person status for at least the following 4 areas of competency: 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. SSHO shall have Construction Health & Safety Technician (CHST) certification and have no other duties other than safety and occupational health management, inspections, and enforcement on this contract.

Level 3:
The SSHO is required to have a minimum of 10 years safety work of a progressive nature with at least 5 years of experience on similar projects. 30-hour OSHA construction safety class or equivalent within the last 5 years. An average of at least 24 hours of formal safety training each year for the past 5 years with training for competent person status for at least the following 4 areas of competency: 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. The SSHO shall have a Certified Safety Professional (CSP) and/or Certified Industrial Hygienist (CIH) certification. The CSP and/or CIH shall have no other duties than safety and occupational health management, inspections, and/or industrial hygiene.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. 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 that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.7.1.1.1 Additional Site Safety and Health Officer (SSHO) Requirements and Duties

The SSHO must have completed a 40 hour contract safety awareness course based on the content and principles of EM 385-1-1, and instructed in accordance with the guidelines of ASSE/SAFE Z490.1, by a trainer meeting the qualifications of paragraph QUALIFIED TRAINER REQUIREMENTS. If the

SSHO does not have a current certification, certification must be obtained within 60 days, maximum, of contract award.

As a minimum this course shall provide the participant with knowledge of the unique EM 385-1-1 U.S. Army Corps of Engineers Safety and Health requirements, NAVFAC P-307 Management of Weight Handling Equipment Manual, Hazard Identification, Recommending Hazard Abatement Methods, Properly preparing a site-specific Accident Prevention Plan (APP), Activity Hazard Analysis (AHA), and other skills necessary to effectively manage a safety program for contractors doing business with the US Navy, NAVFAC, US Army Corps of Engineers and other government DOD agencies.

The 40 Hour Construction Safety Hazard Awareness Course will include a written examination that will cover the following the following safety topics as it applies to the requirements identified in the 1) EM 385-1-1 U.S. Army Corps of Engineers Safety and Health requirements Manual and 2) the NAVFAC P-307 Management of Weight Handling Equipment Manual:

Program Management, Sanitation, Medical and First-Aid Requirements, Temporary Facilities, Personal Protective and Safety Equipment, Hazardous or Toxic Agents and Environments, Lighting, Accident Prevention Signs, Tags, Labels, Signals, Piping System Identification, and Traffic Control, Fire Prevention and Protection, Welding and Cutting, Electrical, Control of Hazardous Energy, Hand and Power Tools, Material Handling, Storage, & Disposal, Rigging, Cranes and Hoisting Equipment, Conveyors, Motor Vehicles, Machinery and Mechanized Equipment, All Terrain Vehicles, Utility Vehicles, and other Specialty Vehicles, Floating Plant and Marine Activities, Pressurized Equipment Systems, Fall Protection, Work Platforms and Scaffolding, Demolition, Safe Access, Ladders, Floor & Wall Openings, Stairs and Railing Systems, Excavations and Trenching, Underground Construction (Tunnels), Shafts, and Caissons, Concrete, Masonry, Steel Erection and Residential Construction, Hazardous Waste Operations and Emergency Response (HAZWOPER), and Confined Space Entry.

This course is periodically offered by General Contractors Association of Hawaii, Hawaii Building Industry Foundation, Associated Builders and Contractors - Hawaii Chapter, and the Guam Contractors Association

1.7.1.2 Contractor Quality Control (QC) Manager:

The Contractor Quality Control Manager cannot be the SSHO on this project, even though the QC has safety inspection responsibilities as part of the QC duties unless otherwise indicated in each task order.

1.7.1.3 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, 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) to the the Contracting Officer for information in consultation

with the Safety Office.

1.7.1.3.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space.

Where this work involves marine operations that handle combustible or hazardous materials, this person must have the ability to understand and follow through on the air sampling, Personal Protective Equipment (PPE), and instructions of a Marine Chemist, Coast Guard authorized persons, or Certified Industrial Hygienist. Confined space and enclosed space work must comply with NFPA 306, OSHA 29 CFR 1915, Subpart B, "Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment," or as applicable, 29 CFR 1910.147 for general industry.

1.7.1.3.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.7.1.3.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

1.7.1.4 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards,Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements.

b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

c. Update training course materials whenever an update of the EM 385-1-1 becomes available.

d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

e. Request, review and incorporate student feedback into a continuous course improvement program.

1.7.1.5 Dredging Contract Requirements

1.7.1.5.1 Dredging Safety Personnel Requirements

a. Provide a minimum of one full time collateral duty SSHO assigned per project site for the primary working shift.

b. For a project involving multiple work shifts, provide one Collateral Duty Safety Officer (CDSO) on a dredge and one at the dredged material placement site. During these shifts, the SSHO must be available at all times to assist with emergency situations.

c. For individual dredging projects or sites with a dredge crew and fill crew on watch of 8 employees or less, a CDSO must be appointed, instead of an SSHO. The CDSO assumes the same responsibilities as a full-time SSHO.

d. An example of one dredging project site is reflected in each of the following:

(1) a mechanical dredge, tug(s) and scow(s), scow route, and material placement site; or

(2) a hydraulic pipeline dredge, attendant plant, and material placement site; or,

(3) a hopper dredge (include land-based material placement site - if applicable.)

e. For Hopper Dredges with the U.S. Coast Guard, documented crews may designate an officer as a Collateral Duty Safety Officer (CDSO) instead of having a full-time SSHO onboard if the officer meets the SSHO training and experience requirements.

1.7.1.5.2 SSHO Requirements for Dredging

a. In addition to requirements stated elsewhere in this specification, an individual serving as a SSHO must be present at the project site, located so that they have full mobility and reasonable access to all major work operations, for at least one shift in each 24 hour period when work is being performed. The SSHO must be available during their shift for immediate verbal consultation and notification, either by phone or radio.

b. The SSHO is a full-time, dedicated position, except as noted above, who must report to a senior project (or corporate) official. When the SSHO is permitted to be a collateral duty, the SSHO is not permitted to be in another position requiring continuous mechanical or equipment operations, such as equipment operators.

c. The SSHO must inspect all work areas and operations during initial set-up and at least monthly observe and provide personal oversight on each shift during dredging operations for projects with many work sites, more often for those with less work sites.

d. If the SSHO is off-site for a period longer than 24 hours, anotherqualified SSHO must be provided and fulfill the same roles and responsibilities as the SSHO during their absence.

1.7.1.5.3 Collateral Duty Safety Officer (CDSO) Requirements for Dredging

a. A CDSO is an individual who is assigned collateral duty safety responsibilities in addition to their full-time occupation, and who supports and supplements the SSHO efforts in managing, implementing and enforcing the Contractor's Safety and Health Program. The assigned CDSO must be an individual(s) with work oversight responsibilities, such as master, mate, fill foreman, or superintendent. A CDSO must not be an employee responsible for continuous mechanical or equipment operations, such as an equipment operator.

b. A CDSO performs safety program tasks as assigned by the SSHO and must report safety findings to the SSHO. The SSHO must document results of safety findings and provide information for inclusion in the CQC reports to the Contracting Officer.

1.7.1.5.4 Safety Personnel Training Requirements for Dredging

A SSHO and a CDSO for dredging contracts must take either a formal classroom or online OSHA 30-hour Construction Safety Course, or an equivalent 30 hours of formal classroom or online safety and health training covering the subjects of the OSHA 30-hour Course in accordance with EM 385-1-1 Appendix A, paragraph 3.d.(3), applicable to dredging work, and given by qualified instructors. In exception to EM 385-1-1, Section 01.A.17, comply with the following:

a. The SSHO must maintain competency through having taken 8 hours of formal classroom or online safety and health related coursework every year. Hours spent as an instructor in such courses will be considered the same as attending them, but each course only gets credit once (for example, instructing a 1-hour asbestos awareness course 5 times in a year provides one hour credit for training).

b. The SSHO and a CDSO must have a minimum of three years of experience within the past five years in one of the following:

(1) Supervising/managing dredging activities

(2) Supervising/managing marine construction activities

(3) Supervising/managing land-based construction activities

(4) Work managing safety programs or processes

(5) Conducting hazard analyses and developing controls in activities or environments with similar hazards

1.7.1.6 Crane Operators/Riggers

Provide Operators meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

Crane Operators must also meet the crane operator requirements of the State of Hawaii for Crane certification.

1.7.2 Personnel Duties

1.7.2.1 Duties of the Site Safety and Health Officer (SSHO)

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 Contractors' daily production report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors. Post and maintain the Form 300 on the site Safety Bulletin Board.

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

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.

k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If 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.

1.7.3 Meetings

1.7.3.1 Prework Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the Prework Conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, 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).

b. 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 Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the scheduling the Prework Conference. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

1.7.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.8 ACCIDENT PREVENTION PLAN (APP)

1.8.1 Plans and Submissions

1.8.1.1 APP - Pre-Design Submittal

Provide a site-specific Accident Prevention Plan (APP), including Activity Hazard Analyses (AHA), in accordance with the US Army Corps of Engineers Safety and Health Manual EM 385-1-1 Appendix A, paragraph 3.k for the design team to follow during site visits and investigations. For subsequent visits, update the form if there are changes in the personnel who will be attending, or the tasks to be performed. Submit the APP for review and acceptance by the Government at least 15 calendar days prior to the start of the design field work. Field work may not begin until the pre-design APP is accepted by the Contracting Officer.

If the design scope includes borings or other subsurface investigations, as part of the APP identify the type of field investigation and verification techniques, such as visual, local utility locating service scanning and third party/subcontractor scanning, potholing, or hand digging within two feet of a known utility. Mark underground utilities before starting any ground-disturbing actions. Notify the Contracting Officer 15 days prior to the start of soil borings or sub-surface investigations.

Prior to the start of construction incorporate the Pre-Design APP into the Pre-Construction APP so that one site specific APP exists for the project

and submit to the Contracting Officer for acceptance

1.8.1.2 APP - Pre-Construction Submittal

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their 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. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. 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 Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.8.2 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of 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 of qualified persons. As a minimum, designate and submit qualifications of competent persons 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; and personal protective equipment and clothing to include selection, use and maintenance.

1.8.3 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.8.3.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, 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.)

1.8.3.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 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 conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.8.3.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

a. For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

b. For barge mounted mobile cranes, provide a Naval Architecture Analysis and include an LHE Manufacturer's Floating Service Load Chart in accordance with the criteria from the selected standard in EM 385-1-1,

Section 16.L.02. The Floating Service Load Chart must provide a table of rated load versus boom angle and radius. The Floating Service Load Chart must also provide the maximum allowable machine list and trim associated with the tabular loads and radii provided. If the Manufacturer's Floating Service Load Chart is not available, a floating service load chart may be developed and provided by a qualified Registered Professional Engineer (RPE), competent in the field of floating cranes. The Load Chart must be in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L; provide a table of rated load versus boom angle and radius; provide the maximum allowable machine list and machine trim associated with the tabular loads and radii provided; and be stamped by a RPE qualified and competent in the field of floating cranes. The RPE, competent in the field of floating cranes must stamp and certify (sign) that the Naval Architectural Analysis (NAA) meets the requirements of EM 385-1-1, Section 16.L.03.

c. Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.8.3.4 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. 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 must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum 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 documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.8.3.5 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. 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.

1.8.3.6 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a

preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.8.3.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 31 00 00 EARTHWORK.

1.8.3.8 Occupant Protection Plan

Identify the safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 82 33.13 20 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD.

1.8.3.9 Lead Compliance Plan

Identify the safety and health aspects of lead work, and prepare in accordance with Section 02 83 13.00 20 LEAD IN CONSTRUCTION.

1.8.3.10 Asbestos Hazard Abatement Plan

Identify the safety and health aspects of asbestos work, and prepare in accordance with Section 02 82 16.00 20 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS.

1.8.3.11 Site Safety and Health Plan

Identify the safety and health aspects, and prepare in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

1.8.3.12 PCB Plan

Identify the safety and health aspects of Polychlorinated Biphenyls work, and prepare in accordance with Sections 02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs) and 02 61 23 REMOVAL AND DISPOSAL OF PCB CONTAMINATED SOILS.

1.8.3.13 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 DEMOLITION AND DECONSTRUCTION and referenced sources. Include engineering survey as applicable.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at

least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.9.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.9.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.10 DISPLAY OF SAFETY INFORMATION

1.10.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety 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 Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may 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 01.A.06. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.10.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.11 SITE SAFETY REFERENCE MATERIALS

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

1.12 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.13 NOTIFICATIONS and REPORTS

1.13.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, load handling equipment (LHE) or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

1.13.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable NAVFAC Contractor Incident Reporting System (CIRS), and electronically submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS). The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: For Navy Projects, complete the applicable documentation in NAVFAC Contractor Incident Reporting System (CIRS), and electronically submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS). Near miss reports are considered positive and proactive Contractor safety management actions.

c. Conduct an accident investigation for any load handling equipment

accident (including rigging gear accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.13.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.13.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.13.5 Third Party Certification of Barge-Mounted Mobile Cranes

Certify barge-mounted mobile cranes in accordance with 29 CFR 1919 by an OSHA accredited person.

1.14 HOT WORK

1.14.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Fire Division. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Division phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DIVISION IMMEDIATELY.

1.14.2 Work Around Flammable Materials

Obtain services from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.15 RADIATION SAFETY REQUIREMENTS

Submit License Certificates, employee training records, and Leak Test Reports for radiation materials and equipment to the Contracting Officer and Radiation Safety Office (RSO), and Contracting Oversight Technician (COT) for all specialized and licensed material and equipment proposed for use on the construction project. Maintain on-site records whenever licensed radiological materials or ionizing equipment are on government property.

Protect workers from radiation exposure in accordance with 10 CFR 20, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

1.15.1 Radiography Operation Planning Work Sheet

Submit a Radiography Operation Planning Work Sheet to Contracting Officer 14 days prior to commencement of operations involving radioactive materials or radiation generating devices. The Contracting Officer and COT will review this worksheet and submit questions and comments.

Contractors must use primary dosimeters process by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

1.15.2 Site Access and Security

Coordinate site access and security requirements with the Contracting Officer and COT for all radiological materials and equipment containing ionizing radiation that are proposed for use on a government facility. The Navy COT or authorized representative will meet the Contractor at a designated location, ensure safety of the materials being transported, and will escort the Contractor to the job site and return upon completion of the work.

Provide a copy of all calibration records, and utilization records to the COT for radiological operations performed on the site.

1.15.3 Loss or Release and Unplanned Personnel Exposure

Loss or release of radioactive materials, and unplanned personnel exposures must be reported immediately to the Contracting Officer, RSO, and Base Security Department Emergency Number.

1.15.4 Site Demarcation and Barricade

Properly demark and barricade an area surrounding radiological operations to preclude personnel entrance, in accordance with EM 385-1-1, Nuclear Regulatory Commission, and Applicable State regulations and license requirements, and in accordance with requirements established in the accepted Radiography Operation Planning Work Sheet.

Do not close or obstruct streets, walks, and other facilities occupied and used by the Government without written permission from the Contracting Officer.

1.15.5 Security of Material and Equipment

Properly secure the radiological material and ionizing radiation equipment at all times, including keeping the devices in a properly marked and locked container, and secondarily locking the container to a secure point in the Contractor's vehicle or other approved storage location during transportation and while not in use. While in use, maintain a continuous visual observation on the radiological material and ionizing radiation equipment. In instances where radiography is scheduled near or adjacent to buildings or areas having limited access or one-way doors, make no assumptions as to building occupancy. Where necessary, the Contracting Officer will direct the Contractor to conduct an actual building entry, search, and alert. Where removal of personnel from such a building cannot be accomplished and it is otherwise safe to proceed with the radiography, position a fully instructed employee inside the building or area to prevent exiting while external radiographic operations are in process.

1.15.6 Transportation of Material

Comply with 49 CFR 173 for Transportation of Regulated Amounts of Radioactive Material. Notify Local Fire authorities and the site Radiation Safety officer (RSO) of any Radioactive Material use.

1.15.7 Schedule for Exposure or Unshielding

Actual exposure of the radiographic film or unshielding the source must not be initiated until after 5 p.m. on weekdays.

1.15.8 Transmitter Requirements

Adhere to the base policy concerning the use of transmitters, such as radios and cell phones. Obey Emissions control (EMCON) restrictions.

1.16 CONFINED SPACE ENTRY REQUIREMENTS.

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used. Contractors entering and working in confined spaces while performing shipyard industry work are required to follow the requirements of OSHA 29 CFR 1915 Subpart B.

1.16.1 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. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.16.2 Forced Air Ventilation

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.

1.16.3 Sewer Wet Wells

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

1.16.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.17 DIVE SAFETY REQUIREMENTS

Develop a Dive Operations Plan, AHA, emergency management plan, and personnel list that includes qualifications, for each separate diving operation. Submit these documents to the District Dive Coordinator (DDC) for review and acceptance at least 15 working days prior to commencement of diving operations. These documents must be at the diving location at all times. Provide each of these documents as a part of the project file.

1.18 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

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

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

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

2.1 CONFINED SPACE SIGNAGE

Provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs for confined spaces must comply with NEMA Z535.2. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" in bold letters a minimum of one inch in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" must be red and readable from 5 feet.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE

includes:

a. Hard Hat

b. Long Pants

c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Use

Each hazardous material must receive approval from the Contracting Office or their designated representative prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

3.1.3 Hazardous Material Exclusions

Notwithstanding 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, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.4 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer 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 FAR 52.243-4, "Changes" and FAR 52.236-2, "Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 15 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, 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 in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and 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, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M,ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.O through 21.O.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing

stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. 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. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 6 feet of an edge, on a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by use of personal fall arrest/restraint systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized. Provide in accordance with 29 CFR 1926.500.

(2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and EM 385-1-1, Section L.

b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:1 (vertical to horizontal) requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also applies to residential or housing type construction.

3.4.4 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person)

supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Plan and 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 or assisted-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 Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.4.7 Fall Prevention During Design Phase

During design phase the Contractor must consider and eliminate fall hazards anticpated during the operation and maintenance evolutions of the facility. If it is not feasible to eliminate or prevent the need to work at heights with the subsequent exposure to fall hazards, control measures must be included in the design to protect personnel conducting maintenance work after completion of the project. In addition to the detailed requirements included in the provisions of this contract, the design work must incorporate the requirements of 29 CFR 1910 and ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE A1264.1, and NFPA 1.

3.5 ERGONOMICS CONSIDERATIONS DURING DESIGN PHASE

Design Facilities, processes, job tasks, tools and materials to reduce or eliminate work-related musculoskeletal (WMSD) injuries and risk factors in the workplace. Ensure that facility maintenance access is designed to reduce WMSD risk factors to the lowest level possible. In addition to the detailed requirements included in the provisions of this contract, the design work must incorporate the requirements of MIL-STD-1472, DoD-HDBK 743 and HFES 100.

3.6 WORK PLATFORMS

3.6.1 Scaffolding

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. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable 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.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. 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 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. 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.

k. 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.

3.6.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.7 EQUIPMENT

3.7.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

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

3.7.2 Load Handling Equipment (LHE)

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Prior to cranes entering federal activities, a Crane Access Permit must be obtained from the Contracting Officer. A copy of the permitting process will be provided at the Preconstruction Conference. Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

g. Do not use crane suspended personnel work platforms (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. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

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

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

j. Use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

m. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.7.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.7.4 USE OF EXPLOSIVES

Explosives must not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval does not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, must be only where directed and in approved storage facilities. These facilities must be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.8 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.8.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service.

3.8.2 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.

3.8.3 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 verified 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. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.9 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.9.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. 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 is 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 are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and 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. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.9.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local requirements applicable to where work is being performed.

3.9.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.9.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.9.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

-- End of Section --

SECTION 01 45 00.05 20

DESIGN AND CONSTRUCTION QUALITY CONTROL
06/15

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 in the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Design Quality Control (DQC) Plan; G

Submit a DQC Plan prior to the Post Award Kickoff Meeting.

Construction Quality Control (CQC) Plan; G

Submit a Construction QC Plan prior to start of construction.

Commissioning Plan; G

Submit a Commissioning Plan within 60 days of approval of Cx Authority.

SD-05 Design Data

Design Quality Control Documentation; G

SD-07 Certificates

Preliminary Inspections and Final Acceptance Testing; G

Final Life Safety/Fire Protection Certification; G

SD-11 Closeout Submittals

Summary Commissioning Report; G

1.3 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program that is administered by a Design and Construction Quality Control organization, using Quality Control (Design and Construction) Plans, Commissioning Plans and Reports, meetings, a Coordination and Mutual Understanding Meeting, three phases of control, submittal review and approval, testing, completion inspections, and QC certifications and documentation necessary to provide design, materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this Contract. The QC program must cover on-site and off-site work. No construction work or testing may be performed unless the QC Manager is on the work site.

1.3.1 QC Plan Meeting

Prior to submission of the QC Plan, the QC Manager may request a meeting with the Contracting Officer to discuss the QC Plan requirements of this Contract.

The purpose of this meeting is to develop a mutual understanding of the QC Plan requirements prior to plan development and submission and to agree on the Contractor's list of Definable Features of Work (DFOWs).

1.3.2 Mutual Understanding Meeting

The purpose of this meeting is to develop a mutual understanding of the QC Plans, including documentation, administration, requirements and procedures, coordination of activities to be performed, and the coordination of the contractor's management, production and QC personnel. At the meeting, the contractor will explain in detail how the three phases of quality control will be implemented for each DFOW.

1.3.3 Design and Construction Quality Control Plans

The contractor must provide a project specific Design Quality Control (DQC) Plan and Construction Quality Control (CQC) Plan, for review and approval by the Contracting Officer. The Contractor must perform no design until the DQC Plan is approved and no construction until the CQC Plan is approved. The Contractor's plans must include the following::

a. The QC organization for this contract, including member resumes.

b. A letter from an officer of the company designating the QC Manager, Alternate QC Manager, DQC Manager, Commissioning Authority, and their authority.

c. QC Manager qualifications.

d. DQC Manager qualifications.

e. List of DFOW including list of design submittal packaging. DFOW is a task that is separate and distinct from other tasks and has control requirements and work crews unique to the task.

f. For the CQC Plan, a plan to implement the "Three Phases of Control" for each DFOW.

g. For the CQC Plan, a testing Plan, log and list of personnel and accredited laboratories that will perform tests. Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation with the testing plan.Coordinate this testing Plan with the Commissioning Plan verification testing requirements to avoid duplication of effort.

h. Submittal Register including design submittals, listing personnel who will review submittals and noting submittals for Contracting Officer review.

i. Procedures for submitting and reviewing design changes/ variations prior to submission to the Contracting Officer.

j. As part of the Contractor's DQC plan, a statement of Life Safety and Fire Protection Features Inspections and Testing must be prepared by the Fire Protection Designer of Record. Examples of life safety and fire protection features include, but are not limited to, water distribution systems including fire pumps and fire hydrants, fire resistive assemblies such as fire rated walls/partitions, through -penetration firestop systems, spray-applied fire proofing of structural components, fire alarm and detection systems, fire suppression and standpipe systems, means of egress components, emergency and exit lighting fixtures. The plan must include a listing of the individuals, approved agencies or firms that will be retained for conducting the required inspections and tests accompanied by a description of individual inspector's experience and a copy of all required certifications. Additional copies of this plan must be submitted to the NAVFAC Fire Protection Engineer and the Installation Fire Chief. This plan must include the following:

(1) Comprehensive list of systems, components or features to be inspected and tested.

(2) Description of performance verification testing activities for each system or component.

(3) Procedures and schedules for functional performance tests of all systems requiring functional testing.

k. For the DQC plan, submit a formal Communication Plan that indicates the frequency of design meetings and what information is covered in those meetings, key design decision points tied to the Network Analysis Schedule and how the DOR plans to include the Government in those decisions, peer review procedures, interdisciplinary coordination, design review procedures, comment resolution, etc.

The Communication Plan must emphasize key decisions and possible problems the Contractor and Government may encounter during the design phase of the project. Provide a plan to discuss design alternatives and design coordination with the stakeholders at the key decision points as they arise on the project. Identify individual stakeholders and suggested communication methods that will be employed to expedite and facilitate each anticipated critical decision. Communication

methods may include: Concept Design Workshop, over-the-shoulder review meetings, presentation at client's office, lifecycle cost analysis presentation, technical phone conversation, and formal review meeting. The design portion of the Communication Plan must be written by the DQC Manager and confirmed during the Post Award Kick off Partnering. Update the Communication Plan at every Partnering meeting.

l. For the DQC Plan, procedures for insuring the design documents are submitted in accordance with FC 1-300-09N, Navy and Marine Corps Design Procedures and other procedures to ensure disciplines have been properly coordinated to eliminate conflicts.

m. For the DQC Plan, provide Quality Control Documentation procedures such as QC review sets and QC comments to demonstrate that cross checking of all engineering disciple's design drawings and specifications has taken place. The QC review documentation must exhibit a checking process of the design documents for completeness, accuracy, and constructability.

n. For the DQC Plan, a list of design subcontractors and the scope of the work which each firm will accomplish.

1.3.4 Commissioning Plan

The Contractor must provide a project specific Commissioning Plan for review and acceptance by the Contracting Officer. The intent of the commissioning plan is to expose all critical issues and resolve them with input from the construction team at early stages of planning. Develop and submit the Commissioning Plan to define the on-site activities and roles and responsibilities for commissioning all building systems required by the Project Program paragraph BUILDING COMMISSIONING. The Commissioning Plan must be updated as information changes during the project. The Plan must include all items required by the LEED NC 2009 and must include the following:

a. Commissioning Authority qualifications and experience.

b. A description of the Commissioning Team's roles and responsibilities as well as organizational relationships with the Contractor's QC Manager, DQC Manager, and verification and testing personnel.

c. A listing of all systems required to be commissioned, include a list of required instruments and components for measurements, verifications, and full commissioning of mechanical systems.

d. A description of the testing and acceptance method used for each system. Describe all commissioning process activities. Include the sequence and schedule for starting and balancing air distribution systems to ensure construction materials, such as architectural finishes, are installed under the appropriate environmental conditions. Also address the procedure that will be used to "dry out" the structure.

e. A procedures and schedule for functional performance tests of all systems to be commissioned. The Commissioning Authrity must present for all functional performance tests. Coordinate this schedule with the QC Plan testing requirements to avoid duplication of effort.

f. Coordinate with eOMSI Preparer to approve the training plan, content of the facility maintenance and operational training, and training

schedule for Government personnel. Provide training sessions on performance of the systems that were commissioned.

1.3.5 Summary Commissioning Report

The Commissioning Authority must provide a Summary Commissioning Report upon completion of the performance verification items. The Summary Commissioning Report must include all items required by LEED NC 2009 and must include the following:

a. Executive Summary of the commissioning process including results and observations of the commissioning program.

b. A history of deficiencies identified and their resolution. Indicate outstanding issues to be resolved.

c. Commissioned systems performance test results and evaluations. Provide a 72 hour data trend utilizing the building automation system. Verify that the trend data reflects proper operation of the system.

1.3.6 Special Inspections

Perform all required Special Inspections and structural observations per Section 01 45 35.05 20 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

1.4 QC ORGANIZATION

The QC Manager must manage the QC organization and must report to the Project Superintendent. The QC Manager, Project Superintendent and Project Manager must work together effectively. Although the QC Manager is the primary individual responsible for quality control, all individuals must be held responsible for the quality of work on the job.

1.4.1 QC and Alternate QC Manager

QC and Alternate QC Manager qualifications:

a. Complete the course entitled "Construction Quality Management (CQM) for Contractors." and maintain a current certificate. The QC Manager that does not have a current certification must obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the Contracting Officer for class schedule information.

b. Familiar with requirements of USACE EM 385-1-1, and experience in the areas of hazard identification and safety compliance.

c. Five years of combined experience as a Superintendent, QC Manager, Project Manager, or Project Engineer on similar size and type construction contracts, and at least two years' experience as a QC Manager.

d. A graduate of a four year accredited college or university program in one of the following disciplines: Engineering, Architecture, Construction Management, Engineering Technology, Building Construction, or Building Science. The QC must have experience on similar size

projects and the type of construction contracts which included the major trades that are part of this Contract.

QC and Alternate QC Manager responsibilities:

a. Participate in the Post Award Kick-off, Partnering, Preconstruction, Design Development, and Coordination and Mutual Understanding Meetings.

b. Implement the "Three Phase of Control" plan for each DFOW and notify the Contracting Officer at least 3 business days in advance of each Preparatory and Initial Phase meeting. Submit respective checklists to the Contracting Officer the next business day.

c. Ensure that no construction begins before the DOR has finalized the design for that segment of work, and construction submittals are approved as required.

d. Inspect all work and rework, using International Conference of Building Officials certified QC specialists as applicable, to ensure its compliance with contract requirements. Maintain a rework log.

e. Immediately stop any segment of work, which does not comply with the contract requirements and direct the removal and replacement of any defective work.

f. Remove any individual from the site who fails to perform their work in a skillful, safe and workmanlike manner or whose work does not comply with the contract plans and specifications.

g. Prepare daily QC Reports.

h. Provide daily photographic documentation to support the work reported in the Daily Reports. Maintain a file of CD/ DVD disks at the job site that assemble the photographs supporting the daily reports. Organize the supporting photographs into searchable files organized by date and under each date organize the photographs in folders for each definable features of work. Indicate on the disk label and disk holder the date range of pictures contained on each disk. Provide a date stamp on each picture and title each picture with a description of location and viewed components. Provide .jpeg color photograph files that are 300 DPI - printable at 8 inch by 10 inch size.

   Photograph construction related to existing work to be covered by contract modifications and required rework as follows;

   (1) View of as-is conditions prior to modification / rework.

   (2) View of as-is conditions with existing exterior enclosure and interior finishes removed before modification / new work begins.

   (3) View of new / modified construction prior to being covered by exterior enclosure and interior finishes.

   (4) View of completed new / modified construction.

i. Ensure that Contractor Production Reports are prepared daily.

j. Hold bi-weekly QC meetings with the DQC Manager, Commissioning Authrity, DOR (or representative), Superintendent and the Contracting

Officer; participation must be suitable for the phase of work. Distribute minutes of these meetings.

k. Ensure that design and construction submittals are reviewed and approved, as required by the contract, prior to allowing material on site and work to proceed with these items. Maintain a submittal register.

l. Update As-built drawings daily, maintaining up-to-date set on site.

m. Maintain a testing plan and log. Ensure that all testing is performed in accordance with the contract. Review all test reports and notify the Contracting Officer of all deficiencies, along with a proposal for corrective action.

n. Maintain rework log on site, noting dates deficiency identified, and date corrected.

o. Certify and sign statement on each invoice that all work to be paid under the invoice has been completed in accordance with contract requirements.

p. Perform Punch-out and participate in Pre-final and Final acceptance Inspections. Submit list of deficiencies to the Contracting Officer for each inspection. Correct all deficiencies prior to the Final inspection. Notify Contracting Officer prior to final inspection to establish a schedule date acceptable by the Contracting Officer.

q. Ensure that all required keys, operation and maintenance manuals, warranty certificates, and the As-built drawings are correct and complete, in accordance with the contract, and submitted to the Contracting Officer.

r. Assure that all applicable tests, and observations required by the contract are performed.

s. Coordinate all factory and on-site testing, Testing Laboratory personnel, QC Specialists, and any other inspection and testing personnel required by this Contract.

t. Notify the Contracting Officer of any proposed changes to the QC plan.

u. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

v. Update the Performance Assessment Plan as described in Section 01 31 19.05 20 POST AWARD MEETINGS and discuss monthly at a QC meeting.

w. Coordinate training of Government maintenance personnel with the eOMSI Preparer to assure training materials and training classes are accurate and provide instruction and documentation on critical elements of the products, materials, and systems in the constructed facility. Verify that the Government's operating personnel were trained.

x. Coordinate scheduled work with Special Inspections required by Section 01 45 35.05 20 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

y. Supervise all Special Inspectors required by the contract documents and

the IBC.

z. Verify the qualifications of all of the Special Inspectors.

aa. Verify the qualifications of fabricators.

bb. Maintain a 3- ring binder for the Special Inspector's daily and biweekly reports. This file must be located in a conspicuous place in the project trailer/office to allow review by the Contracting Officer and the DOR.

1.4.2 DQC Manager

The DQC Manager must be a member of the QC organization, must coordinate actions with the QC Manager , and must not be subordinate to the Project Superintendent or the Project Manager. The DQC Manager may also act as the Commissioning Authority if all Commissioning Authority qualifications are met.

DQC Manager qualifications:

a. A minimum of 5 years' experience as a design Architect or Engineer on similar size and type designs / or design-build contracts. Provide education, experience, and management capabilities on similar size and type contracts.

b. Be a registered professional engineer or architect with an active registration. Provide proof of registration as part of the resume submittal package.

c. Complete the course entitled "Construction Quality Management (CQM) for Contractors."

DQC Manager responsibilities:

a. Be responsible for the design integrity, professional design standards, and all design services required.

b. Be a member of the Designer of Record's (DOR) firm.

c. Be responsible for development of the design portion of the QC Plan, incorporation and maintenance of the approved Design Schedule, and the preparation of DQC Reports and minutes of all design meetings.

d. Participate in the Post Award Kick-Off, all design planning meetings, design presentations, partnering, and QC meetings.

e. Implement the DQC plan and must remain on staff involved with the project until completion of the project.

f. Be cognizant of and assure that all design documents on the project have been developed in accordance with the Contract.

g. Provide Design Quality Control Documentation (DQCD) which indicates design coordination of the engineering disciplines. Submit DQCD with the pre-final and final design submittals as required in Section 01 33 10.05 20, DESIGN SUBMITTAL PROCEDURES.

h. Develop the submittal register. Coordinate with each DOR to determine

what items need to be submitted, and who needs to approve.

i. Provide QC certification for design compliance.

j. Certify and sign statement on each invoice that all work to be paid to the DOR under the invoice has been completed in accordance with the contract requirements.

k. Prepare weekly DQC Reports that document the work the design team accomplished that week.

l. Coordinate all training requirements with the QC and in accordance with 01 78 23 OPERATION AND MAINTENANCE DATA.

1.4.3 Commissioning Authority

Commissioning Authority qualifications:

The Commissioning Authority must be a member of the QC organization, must coordinate actions with the QC Manager, must not be subordinate to the Project Superintendent or the Project Manager, and must report findings directly to the Contracting Officer. The Commissioning Authority may also act as the DQC Manager if all DQC Manager qualifications are met. The Commissioning Authority selected must meet the requirements of LEED NC with the following additional qualifications:

a. Be certified Building System Commissioning (Cx) Contractor recognized by a Building Commissioning Organization. Acceptable minimum certifications are "Certified Cx Agent" from the Associated Air Balance Council (AABC); "NEBB Building Systems Cx Certified Professional" from National Environmental Balancing Bureau (NEBB); "Certified Building Cx Professional" from the Association of Energy Engineers (AEE); "Certified Cx Professional (CxP)" from the Building Commissioning Association (BCA); or "Commissioning Process Authority Professional" or "Commissioning Process Manager" from the University of Wisconsin College of Engineering.

b. Have documented Commissioning Authority experience in at least two building projects. Provide proof of commissioning experience as part of the Commissioning Plan.

Commissioning Authority Responsibilities:

a. Be responsible for development of the Commissioning Plan, the Summary Commissioning Report, and minutes of all commissioning meetings.

b. Participate in the Post Award Kick-Off, all design planning meetings, design presentations, partnering, and QC meetings.

c. Review the Request for Proposal (RFP) for energy and sustainability goals, system expectations, O&M requirements, training expectations, and construction quality expectations.

d. Review the Basis of Design and ensure the RFP requirements are met.

e. Ensure commissioning requirements are incorporated into the construction documents.

f. Assure the electrical requirements of the actual equipment supplied by

the mechanical contractor are verified, reviewed and coordinated with the electrical and other trades.

g. Be responsible for implementation and updating of the Commissioning Plan.

h. Be responsible for development of systems functional testing procedures.

i. Ensure pre-functional installation inspections are performed on all systems indicated to be commissioned in accordance with the Commissioning Plan and Contract documents.

j. Verify systems performance of all systems indicated to be commissioned in accordance with the Commissioning Plan and Contract documents.

k. Report any deficiencies in installation, general performance, operation, and functional performance of all systems indicated to be commissioned.

l. Participate in the eOMSI Field Validation to assure the accuracy of the eOMSI Data and eOMSI Document information prior to the submission of the Final eOMSI submittal.

m. Coordinate training of Government maintenance personnel with the eOMSI Preparer to assure training materials and training classes are accurate and provide instruction and documentation on critical elements of the products, materials, and systems in the constructed facility. Verify that the Government's operating personnel were trained on the information necessary to operate the facility.

1.4.4 QC Specialists

QC Specialists must assist and report to the QC Manager and may perform production related duties but must be allowed sufficient time to perform their assigned quality control duties. QC Specialists are required to attend the Coordination and Mutual Understanding Meeting, QC meetings and be physically present at the construction site to perform the three phases of control and prepare documentation for each definable feature of work in their area of responsibility at the frequency specified below.

1.4.4.1 Fire Protection QC Specialist

The Fire Protection QC Specialist (FPQC) must be a U.S. registered Professional Engineer and must be an integral part of the Prime Contractor's Quality Control Organization. This FPQC must have no business relationships (owner, partner, operating officer, distributor, salesman, or technical representative) with any fire protection equipment device manufacturers, suppliers or installers for any such equipment provided as part of this project. The Fire Protection Designer of Record may serve as the lead Fire Protection QC Specialist, provided the following qualifications are met.

a. Qualifications/Experience: The FPQC must have obtained their professional registration by successfully completing the Fire Protection Engineering discipline examination. This FPQC must have a minimum of 5 years full time and exclusive experience in every aspect of facility design and construction as it relates to fire protection, which includes, but is not limited to, building code analysis, life safety code analysis, design of automatic detection and suppression

systems, passive fire protection design, water supply analysis, and a multi-discipline coordination reviews, and construction surveillance.

b. Area of Responsibility: The FPQC is responsible for assuring the proper construction and installation of life safety and fire protection features across all disciplines and trades. The FPQC must be responsible for assuring that life safety and fire protection features are provided in accordance with the design documents, approved construction submittals, and manufacturer's requirements. Examples include, but are not limited to, water distribution systems including fire pumps and fire hydrants, fire resistive assemblies such as spray-applied fire proofing of structural components and fire rated walls/partitions, fire alarm and detection systems, fire suppression and standpipe systems, emergency and exit lighting fixtures, etc.

c. Construction Surveillance: The FPQC is responsible for reviewing and implementing the QC Plan developed by the Fire Protection DOR. The FPQC must visit the construction site as necessary to ensure life safety and fire protection systems are being constructed, applied, and installed in accordance with the approved design documents, approved construction submittals, and manufacturer's requirements. Frequency and duration of the field visits are dependent upon particular system components, system complexity, and phase of construction. At a minimum, field visits must occur just prior to installation of suspended ceiling systems to inspect the integrity of passive fire protection features and fire suppression system piping, and required performance verification testing of all life safety and fire protection systems identified below and in Part 4.

(1) Preliminary Inspections and Final Acceptance Testing: FPQC must personally witness all preliminary inspections of fire alarm/detection and suppression systems. Once preliminary inspections have been successfully completed, the FPQC must submit a signed certificate to the QC Manager that systems are ready for final inspection and testing. The Naval Facilities Engineering Command Fire Protection Engineer will witness formal tests and approve all systems before they are accepted. The QC Manager must submit the request for formal inspection at least 15 days prior to the date the inspection is to take place. The QC Manager must provide 10 days advance notice to the Contracting Officer and the activity Fire Inspection Office of scheduled final inspections.

d. QC Documentation and Certifications: The following documentation and certification must be prepared by the FPQC. Additional copies must be submitted to the NAVFAC Fire Protection Engineer and the Installation Fire Chief.

(1) Field visit reports. Submit reports documenting all field visits and summarizing all findings.

(2) Inspection and Test reports and certificates. Submit in accordance with the applicable codes, standards, and this RFP.

(3) Final Life Safety/Fire Protection Certification. Provide FPQC certification that all life safety and fire protection systems have been inspected and in the FPQC's professional judgment, have been installed in accordance with the contract documents, approved submittals, and manufacturer's requirements. This certification must summarize all life safety and fire protection features, and

must bear the professional seal of the fire protection engineer.

1.4.4.2 Mechanical QC Specialist

Qualification/Experience in Area of Responsibility	Area of Responsibility	Frequency
Mechanical Inspector, International Conference of Building Officials (ICBO) Certified / 5 years minimum	Installation and Testing of Boilers	Minimum 3 times a week during installation and full-time during testing
Certified Elevator Inspector, certified by an organization accredited by ASME / 5 years minimum	Pretesting to ensure safety code, specification, and building code compliance; provide testing verification report prior to beginning final acceptance test	Once every two weeks during installation, full time during Pretesting
Registered Mechanical Engineer (PE)/ QC Specialist	Testing of Installed mechanical systems	Full time during testing

1.4.4.3 Building Envelope QC Specialists

Qualification / Experience in Area of Responsibility	Area of Responsibility	Frequency
Roofing Manufacturer's Technical Representative / 5 years minimum with roofing system used.	Installation and testing of roofing.	Once a week during installation, two times a Once a week during flashing installation and full time during roof testing.

1.4.4.4 Special Inspector

The Special Inspector (SI) must be an independent third party hired directly by the Prime Contractor. The SI must have not be a company employee of the Contractor or any Sub-Contractor performing the work to be inspected. The qualifications of the SI are defined in Section 01 45 35.05 20 SPECIAL INSPECTION.

1.5 THREE PHASES OF CONTROL

The Three Phases of Control must adequately cover both on-site and off-site work and must include the following for each DFOW.

1.5.1 Preparatory Phase

Notify the Contracting Officer at least two work days in advance of each

preparatory phase meeting. The meeting must be conducted by the QC Manager and attended by the Project Superintendent, QC Specialists, and the foreman responsible for the DFOW. The Special Inspector must also attend if required by Special Inspections, as outlined in the Statement of Special Inspections and Schedule of Special Inspections. When the DFOW will be accomplished by a subcontractor, that subcontractor's foreman must attend the preparatory phase meeting. Document the results of the preparatory phase actions in the daily Contractor Quality Control Report and in the Preparatory Phase Checklist. Perform the following prior to beginning work on each DFOW:

a. Review each paragraph of the applicable specification sections;

b. Review the Contract drawings;

c. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;

d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;

e. Review Special Inspections required by Section 01 45 35.05 20 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

f. Examine the work area to ensure that the required preliminary work has been completed;

g. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data;

h. Discuss the specific controls used in construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFOW; and

i. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted.

1.5.2 Initial Phase

Notify the Contracting Officer at least two work days in advance of each initial phase. When construction crews are ready to start work on a DFOW, conduct the initial phase with the Project Superintendent, QC Specialists, and the foreman responsible for that DFOW. The Special Inspector or Special Inspector of Record must also attend if required by Special Inspections, as outlined in the Statement of Special Inspections and Schedule of Special Inspections. Observe the initial segment of the DFOW to ensure that the work complies with Contract requirements. Document the results of the initial phase in the daily CQC Report and in Initial Phase Checklist. Repeat the initial phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each DFOW:

a. Establish the quality of workmanship required;

b. Resolve conflicts;

c. Ensure that testing is performed by the approved laboratory, and

d. Check work procedures for compliance with the APP and the appropriate AHA to ensure that applicable safety requirements are met.

e. Ensure manufacturer's representative has performed necessary inspections, if required.

f. Coordinate scheduled work with Special Inspections required by the Section 01 45 35.05 20 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

1.5.3 Follow-Up Phase

Perform the following for on-going work daily, or more frequently as necessary, until the completion of each DFOW and document in the daily CQC Report:

a. Ensure the work is in compliance with Contract requirements;

b. Maintain the quality of workmanship required;

c. Ensure that testing is performed by the approved laboratory; and

d. Ensure that rework items are being corrected.

e. Coordinate scheduled work with Special Inspections required by the Section 01 45 35.05 20 SPECIAL INSPECTIONS, the Statement of Special Inspections and the Schedule of Special Inspections.

1.5.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases must be conducted on the same DFOW if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if work on a DFOW is resumed after substantial period of inactivity, or if other problems develop.

1.5.5 Notification of Three Phases of Control for Off-Site Work

Notify the Contracting Officer at least two weeks prior to the start of the preparatory and initial phases.

1.6 COMPLETION INSPECTIONS

The Contractor must perform the necessary punch-out, pre-final, and final inspections, compile punch lists, and correct deficiencies.

1.6.1 Punch-Out Inspection

Near the completion of all work or any increment thereof, established by a completion time stated in the Contract Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager and the CA must conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings, specifications and Contract. Include in the punch list any remaining items on the "Rework Items List", which were not corrected

prior to the Punch-Out Inspection. Include within the punch list the estimated date by which the deficiencies will be corrected. Provide a copy of the punch list to the Contracting Officer. The QC Manager, or staff, must make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Contracting Officer that the facility is ready for the Government "Pre-Final Inspection".

1.6.2 Pre-Final Inspection

The Government and QC Manager will perform this inspection to verify that the facility is complete and ready to be occupied. A Government "Pre-Final Punch List" will be documented by the QC Manager as a result of this inspection. The QC Manager will ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the Client can be scheduled. Any items noted on the "Pre-Final" inspection must be corrected in a timely manner and be accomplished before the contract completion date for the work or any particular increment thereof, if the project is divided into increments by separate completion dates.

1.6.3 Final Acceptance Inspection

Notify the Contracting Officer at least 14 calendar days prior to the date a final acceptance inspection can be held. State within the notice that all items previously identified on the pre-final punch list will be corrected and acceptable, along with any other unfinished Contract work, by the date of the final acceptance inspection. The Contractor must be represented by the QC Manager, the Project Superintendent, the CA, and others deemed necessary. Attendees for the Government will include the Contracting Officer, other FEAD/ROICC personnel, and personnel representing the Client. Failure of the Contractor to have all contract work acceptably complete for this inspection will because for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract Clause entitled "Inspection of Construction."

1.7 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 45 35.05 20

SPECIAL INSPECTIONS
09/15

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.

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC (2012) International Building Code

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-301-01 (2013; Change 1) Structural Engineering

1.2 GENERAL REQUIREMENTS

Perform Special Inspections in accordance with the Statement of Special Inspections, Schedule of Special Inspections and Chapter 17 of ICC IBC.

Special Inspections are to be performed by an independent third party and are intended to ensure that the work of the prime contractor is in accordance with the Contract Documents and applicable building codes. Special inspections do not take the place of the three phases of control inspections performed by the Contractor's QC Manager or any testing and inspections required by other sections of the specifications.

1.2.1 Fabricator Special Inspections

Special Inspections of fabricator's work performed in the fabricator's shop is required to be inspected in accordance with the Statement of Special Inspections and the Schedule of Special Inspections unless the fabricator is certified by the approved agency to perform such work without Special Inspections. Submit the following certifications to the Contracting Officer for information to allow work performed in the fabricator's shop to not be subjected to Special Inspections.

American Institute of Steel Construction (AISC) Certified Fabrication Plant, Category STD.

Truss Plate Institute (TPI) steel truss plant quality assurance program certification.

Truss Plate Institute (TPI) wood truss plant quality assurance program certification.

International Accreditation Service, AC472 Accreditation

Steel Joist Institute Membership

Precast Concrete Institute (PCI) Certified Plant, Group C

At the completion of fabrication, submit a certificate of compliance, to be included with the final report of Special Inspections, stating that the materials supplied and work performed by the fabricator are in accordance the construction documents.

1.2.2 Defective Work

Check work as it progresses. Failure to detect any defective work or materials must in no way prevent later rejection if defective work or materials are discovered, nor obligate the Contracting Officer to accept such work.

1.3 DEFINITIONS

1.3.1 Continuous Special Inspections

Continuous Special Inspections are the constant monitoring of specific tasks by a special inspector. These inspections must be carried out continuously over the duration of the particular tasks.

1.3.2 Periodic Special Inspections

Periodic Special Inspections are Special Inspections by the special inspector who is intermittently present where the work to be inspected has been or is being performed.

1.3.3 Perform

Perform these Special Inspections tasks for each welded joint or member.

1.3.4 Observe

Observe these Special Inspections items on a random daily basis. Operations need not be delayed pending these inspections.

1.3.5 Special Inspector (SI)

A qualified person retained by the contractor and approved by the Contracting Officer as having the competence necessary to inspect a particular type of construction requiring Special Inspections. The SI must be an independent third party hired directly by the Prime Contractor.

1.3.6 Associate Special Inspector (ASI)

A qualified person who assists the SI in performing Special Inspections but must perform inspection under the direct supervision of the SI and cannot perform inspections without the SI on site.

1.3.7 Third Party

A third party inspector must not be company employee of the Contractor or any Sub-Contractor performing the work to be inspected.

1.3.8 Special Inspector of Record (SIOR)

A licensed engineer in responsible charge of supervision of all special inspectors for the project and approved by the Contracting officer. The SIOR must be an independent third party hired directly by the Prime Contractor.

1.3.9 Contracting Officer

The Government official having overall authority for administrative contracting actions. Certain contracting actions may be delegated to the Contracting Officer's Representative (COR).

1.3.10 Contractor's Quality Control (QC) Manager

An individual retained by the prime contractor and qualified in accordance with the requirements of UFGS 01 45 00.05 20 CONSTRUCTION QUALITY CONTROL having the overall responsibility for the contractor's QC organization.

1.3.11 Designer of Record (DOR)

A registered design professional, retained by the prime contractor, responsible for the overall design and review of submittal documents prepared by others. The DOR is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws in state in which the design professional works. The DOR is also referred to as the Engineer of Record (EOR) in design code documents.

1.3.12 Statement of Special Inspections (SSI)

A document developed by the DOR identifying the material, systems, components and work required to have Special Inspections.

1.3.13 Schedule of Special Inspections

A schedule which lists each of the required Special Inspections, the extent to which each special inspection is to be performed, and the required frequency (periodic or continuous)for each in accordance with ICC IBC Chapter 17.

1.3.14 Structural Observations

Specific structural observations performed by the structural DOR as required by UFC 3-301-01.

1.3.15 Designated Seismic System

Those nonstructural architectural, mechanical, and electrical systems or their components, in Risk Category III and IV, that are required to be designed in accordance with Chapter 13 of ASCE 7 and for which the component importance factor is greater than 1. All systems in Risk Category V facilities designated as MC-1 per UFC 3-310-04 are considered part of the Designated Seismic System.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Statement of Special Inspections; G

Structural Observations; G

SIOR Letter of Acceptance; G

Special Inspections Project Manual; G

Special Inspections Agency's Written Practices

NDT Procedures and Equipment Calibration Records

SD-06 Test Reports

Special Inspections Daily Reports

Special Inspections Biweekly Reports

SD-07 Certificates

AISC Certified Fabrication Plant

TPI Steel Truss Plant Quality Assurance

TPI Wood Truss Plant Quality Assurance

AC472 Accreditation

Steel Joist Institute Membership

PCI Certified Plant

Special Inspector of Record Qualifications; G

Special Inspector Qualifications; G

Qualification Records for NDT Technicians

SD-11 Closeout Submittal

Interim Final Report of Special Inspections

Comprehensive Final Report of Special Inspections; G

Final Report of Structural Observations; G

Final Walk-Down Inspection Report; G

1.5 SPECIAL INSPECTOR QUALIFICATIONS

Submit qualifications for each special inspector and the special inspector of record.

Certifying Associations

Certifying Associations	
AABC	Associated Air Balance Council
ACI	American Concrete Institute
AWCI	Association of the Wall and Ceiling Industry
AWS	American Welding Society
FM	Factory Mutual
ICC	International Code Council
NDT	Nondestructive Testing
NICET	National Institute for Certification in Engineering Technologies
PCI	Precast/Prestressed Concrete Institute
PTI	Post-Tensioning Institute
UL	Underwriters Laboratories

1.5.1 Steel Construction and High Strength Bolting

1.5.1.1 Special Inspector

a. ICC Structural Steel and Bolting Special Inspector certificate with one year of related experience, or

b. Registered Professional Engineer with related experience

1.5.1.2 Associate Special Inspector

Engineer-In-Training with one year of related experience.

1.5.2 Welding Structural Steel

1.5.2.1 Special Inspector

a. ICC Structural Welding Special Inspector certificate with one year of related experience, or

b. AWS Certified Welding Inspector

1.5.2.2 Associate Special Inspector

a. AWS Certified Associate Welding Inspector

1.5.3 Nondestructive Testing of Welds

1.5.3.1 Special Inspector

a. NDT Level III Certificate

1.5.3.2 Associate Special Inspector

a. NDT Level II Certificate plus one year of related experience

1.5.4 Cold Formed Steel Framing

1.5.4.1 Special Inspector

a. ICC Structural Steel and Bolting Special Inspector certificate with one year of related experience, or

b. ICC Commercial Building Inspector with one year of experience, or

c. ICC Residential Building Inspector with one year of experience, or

d. Registered Professional Engineer with related experience

1.5.4.2 Associate Special Inspector

Engineer-In-Training with one year of related experience

1.5.5 Concrete Construction

1.5.5.1 Special Inspector

a. ICC Reinforced Concrete Special Inspector Certificate with one year of related experience, or

b. ACI Concrete Construction Special Inspector, or

c. NICET Concrete Technician Level III Certificate in Construction Materials Testing, or

d. Registered Professional Engineer with related experience

1.5.5.2 Associate Special Inspector

a. ACI Concrete Construction Special Inspector in Training, or

b. Engineer-In-Training with one year of related experience

1.5.6 Prestressed Concrete Construction

1.5.6.1 Special Inspector

a. ICC Pre-stressed Special Inspector Certificate with one year of related experience, or

b. PCI Quality Control Technician/ Inspector Level II Certificate with one year of related experience, or

c. Registered Professional Engineer with related experience

1.5.6.2 Associate Special Inspector

a. PCI Quality Control Technician/ Inspector Level I Certificate with one year of related experience, or

b. Engineer-In-Training with one year of related experience

1.5.7 Post-tensioned Concrete Construction

1.5.7.1 Special Inspector

a. PTI Level 2 Unbonded PT Inspector Certificate, or

b. Registered Professional Engineer with related experience

1.5.7.2 Associate Special Inspector

a. PTI Level 1 Unbonded PT Inspector Certificate with one year of related experience, or

b. Engineer-In-Training with one year of related experience

1.5.8 Masonry Construction

1.5.8.1 Special Inspector

a. ICC Structural Masonry Special Inspector Certificate with one year of related experience, or

b. Registered Professional Engineer with related experience

1.5.8.2 Associate Special Inspector

Engineer-In-Training with one year of related experience

1.5.9 Wood

1.5.9.1 Special Inspector

a. ICC Commercial Building Inspector Certificate with one year of related experience, or

b. ICC Residential Building Inspector with on year of experience, or

c. Registered Professional Engineer with related experience

1.5.9.2 Associate Special Inspector

Engineer-In-Training with one year of related experience

1.5.10 Verification of Site Soil Condition, Fill Placement and Load-Bearing Requirements

1.5.10.1 Special Inspector

a. ICC Soils Special Inspector Certificate with one year of related experience, or

b. NICET Soils Technician Level II Certificate in Construction Material Testing, or

c. NICET Geotechnical Engineering Technician Level II Construction or Generalist Certificate, or

d. Geologist-In-Training with one year of related experience, or

e. Registered Professional Engineer with related experience

1.5.10.2 Associate Special Inspector

a. NICET Soils Technician Level I Certificate in Construction Material Testing with one year of related experience, or

b. NICET Geotechnical Engineering Technician Level I Construction or Generalist Certificate with one year of related experience, or

c. Engineer-In-Training with one year of related experience

1.5.11 Deep Foundations

1.5.11.1 Special Inspector

a. NICET Soils Technician Level II Certificate in Construction Material Testing, or

b. NICET Geotechnical Engineering Technician Level II Construction or Generalist Certificate, or

c. Geologist-In-Training with one year of related experience, or

d. Registered Professional Engineer with related experience

1.5.11.2 Associate Special Inspector

a. NICET Soils Technician Level I Certificate in Construction Material Testing with one year of related experience, or

b. NICET Geotechnical Engineering Technician Level I Construction or Generalist Certificate with one year of related experience, or

c. Engineer-In-Training with one year of related experience

1.5.12 Sprayed Fire Resistant Material

1.5.12.1 Special Inspector

a. ICC Spray-applied Fireproofing Special Inspector Certificate, or

b. ICC Fire Inspector I Certificate with one year of related experience, or

c. Registered Professional Engineer with related experience

1.5.12.2 Associate Special Inspector

Engineer-In-Training with one year of related experience

1.5.13 Mastic and Intumescent Fire Resistant Coatings

1.5.13.1 Special Inspector

a. ICC Spray-applied Fireproofing Special Inspector Certificate, or

b. ICC Fire Inspector I Certificate with one year of related experience,

or

c. Registered Professional Engineer with related experience

1.5.13.2 Associate Special Inspector

Engineer-In-Training with one year of related experience

1.5.14 Exterior Insulation and Finish System (EIFS)

1.5.14.1 Special Inspector

a. AWCI EIFS Inspector Certificate, or

b. Exterior Design Institute Certificate, or

c. Registered Professional Engineer with related experience

1.5.14.2 Associate Special Inspector

Engineer-In-Training with one year of related experience

1.5.15 Fire-Resistant Penetrations and Joints

1.5.15.1 Special Inspector

a. Passed the UL Firestop Exam with one year of related experience, or

b. Passed the FM Firestop Exam with one year of related experience, or

c. Registered Professional Engineer with related experience

1.5.15.2 Associate Special Inspector

Engineer-In-Training with one year of related experience

1.5.16 Smoke Control

1.5.16.1 Primary Inspector

a. AABC Technician Certification with one year of related experience, or

b. Registered Professional Engineer with related experience

1.5.16.2 Associate Special Inspector

Engineer-In-Training with one year of related experience

1.5.17 Special Inspector of Record (SIOR)

Registered Professional Engineer

1.6 RESPONSIBILITIES

1.6.1 Special Inspector of Record (SIOR)

a. Supervise all Special Inspectors required by the contract documents and the ICC IBC.

b. Submit a letter to the Contracting Officer attesting to acceptance of the duties of SIOR, signed and sealed by the SIOR.

c. Verify the qualifications of all of the Special Inspectors.

d. Verify the qualifications of fabricators.

e. Submit Special Inspections agency's written practices for the monitoring and control of the agency's operations to include the following:

(1) The agency's procedures for the selection and administration of inspection personnel, describing the training, experience and examination requirements for qualifications and certification of inspection personnel.

(2) The agency's inspection procedures, including general inspection, material controls, and visual welding inspection.

f. Submit qualification records for nondestructive testing (NDT) technicians designated for the project.

g. Submit NDT procedures and equipment calibration records for NDT to be performed and equipment to be used for the project.

h. Prepare a Special Inspections Project Manual, which will cover the following:

(1) Roles and responsibilities of the following individuals during Special Inspections: SIOR, SI, General Contractor, Subcontractors, QC Manager, and DOR.

(2) Organizational chart and/or communication plan, indicating lines of communication.

(3) Contractor’s internal plan for scheduling inspections. Address items such as timeliness of inspection requests, who to contact for inspection requests, and availability of alternate inspectors.

(4) Indicate the government reporting procedures.

(5) Propose forms or templates to be used by SI and SIOR to document inspections.

(6) Indicate procedures for tracking nonconforming work and verification that corrective work is complete.

(7) Indicate how the SIOR and/or SI will participate in weekly QC meetings.

(8) Indicate how Special Inspections of shop fabricated items will be handled when the fabricator’s shop is not certified per paragraph FABRICATOR SPECIAL INSPECTIONS.

(9) Include a section in the manual that covers each specific item requiring Special Inspections that is indicated on the Schedule of Special Inspections. Provide names and qualifications of each special inspector who will be performing the Special Inspections for each specific item. Provide detail on how the Special

Inspections are to be carried out for each item so that the expectations are clear for the General Contractor and the Subcontractor performing the work.

Make a copy of the Special Inspections Project Manual available on the job site during construction. Submit a copy of the Special Inspections Project Manual for approval.

i. Attend coordination and mutual understanding meeting where the information in the Special Inspections Project Manual will be reviewed to verify that all parties have a clear understanding of the Special Inspections provisions and the individual duties and responsibilities of each party.

j. Maintain a 3- ring binder for the Special Inspector's daily and biweekly reports and the SI Project Manual. This file must be located in a conspicuous place in the project trailer/office to allow review by the Contracting Officer and the DOR.

k. Submit a copy of the Special Inspector’s daily reports to the QC Manager.

l. Discrepancies that are observed during Special Inspections must be reported to the QC Manager for correction. If discrepancies are not corrected before the special inspector leaves the site the observed discrepancies must be documented in the daily report.

m. Submit a biweekly Special Inspections report to the Contracting Officer until all work requiring Special Inspections is complete. A report is required for each biweekly period in which Special Inspections activity occurs, and must include the following:

(1) A brief summary of the work performed during the reporting time frame.

(2) Changes and/or discrepancies with the drawings, specifications and mechanical or electrical component certification, that were observed during the reporting period.

(3) Discrepancies which were resolved or corrected.

(4) A list of nonconforming items requiring resolution.

(5) All applicable test results including nondestructive testing reports.

n. At the completion of each Definable Feature of Work (DFOW) requiring Special Inspections, submit an interim final report of Special Inspections to the Contracting Officer that documents the Special Inspections completed for that DFOW and corrections of all discrepancies noted in the daily reports. The interim final report of Special Inspections must be signed, dated and bear the seal of the SIOR.

o. At the completion of the project submit a comprehensive final report of Special Inspections that documents the Special Inspections completed for the project and corrections of all discrepancies noted in the daily reports. The comprehensive final report of Special Inspections must be signed, dated and bear the seal of the SIOR.

1.6.2 Quality Control Manager

a. Supervise all Special Inspectors required by the contract documents and the ICC IBC.

b. Verify the qualifications of all of the Special Inspectors.

c. Verify the qualifications of fabricators.

d. Maintain a 3-ring binder for the Special Inspector's daily and biweekly reports. This file must be located in a conspicuous place in the project trailer/office to allow review by the Contracting Officer and the DOR.

e. Maintain a rework items list that includes discrepancies noted on the Special Inspectors daily report.

1.6.3 Special Inspectors

a. Inspect all elements of the project for which the special inspector is qualified to inspect and are identified in the Schedule of Special Inspections.

b. Attend preparatory phase meetings related to the Definable Feature of Work (DFOW) for which the special inspector is qualified to inspect.

c. Submit Special Inspections agency’s written practices for the monitoring and control of the agency’s operations to include the following:

(1) The agency’s procedures for the selection and administration of inspection personnel, describing the training, experience and examination requirements for qualifications and certification of inspection personnel.

(2) The agency’s inspection procedures, including general inspection, material controls, and visual welding inspection.

d. Submit qualification records for nondestructive testing (NDT) technicians designated for the project.

e. Submit NDT procedures and equipment calibration records for NDT to be performed and equipment to be used for the project.

f. Submit a copy of the daily reports to the QC Manager.

g. Discrepancies that are observed during Special Inspections must be reported to the QC Manager for correction. If discrepancies are not corrected before the special inspector leaves the site the observed discrepancies must be documented in the daily report.

h. Submit a biweekly Special Inspection Report until all inspections are complete. A report is required for each biweekly period in which Special Inspections activity occurs, and must include the following:

(1) A brief summary of the work performed during the reporting time frame.

(2) Changes and/or discrepancies with the drawings, specifications and

mechanical or electrical component certification, that were observed during the reporting period.

(3) Discrepancies which were resolved or corrected.

(4) A list of nonconforming items requiring resolution.

(5) All applicable test result including nondestructive testing reports.

i. At the completion of each Definable Feature of Work (DFOW) requiring Special Inspections, submit an interim final report of Special Inspections to the Contracting Officer that documents the Special Inspections completed for that DFOW. Identify the inspector responsible for each item inspected and corrections of all discrepancies noted in the daily reports. The interim final report of Special Inspections must be signed, dated and indicate the certification of the special inspector qualifying them to conduct the inspection.

j. At the completion of the project submit a comprehensive final report of Special Inspections that documents the Special Inspections completed for the project and corrections of all discrepancies noted in the daily reports. The comprehensive final report of Special Inspections must be signed, dated and indicate the certification of the special inspector qualifying them to conduct the inspection

k. Submit daily reports to the SIOR.

1.6.4 Designer of Record

a. Develop the Statement of Special Inspections and the Schedule of Special Inspections as defined in Chapter 17 of ICC IBC. Submit the Statement of Special Inspections and the Schedule of Special Inspections for approval by the Contracting Officer.

The Statement of Special Inspection must include the following information:

(1) List of Architectural Designated Seismic Systems.

(2) List of Mechanical Designated Seismic Systems.

(3) List of the Electrical Designated Seismic Systems.

(4) Define the periodic walk-down inspections required by UFC 3-301-01.

(5) List of elements that are part of the progressive collapse resistance system.

Develop Schedule of Special Inspection using the template located on the Whole Building Design Guide website at: http://wbdg.org/ccb/NAVGRAPH/graphtoc.pdf.

b. Prior to the start of structural observations submit a written statement identifying the frequency and delineation wind/seismic force resisting system requiring structural observations.

c. At the conclusion of the structural observations submit a final report

of structural observations indicating that the structural observation site visits have been made and identify any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved.

d. Perform a final walk-down inspection of the designate seismic systems for mechanical and electrical components with the Nonstructural Component Design Review Panel to ensure that the non-structural elements satisfy life safety mounting requirements as defined in the Statement of Special Inspections.

e. Submit a report of the final walk-down inspection that includes the following:

(1) Record/observations of final site visit

(2) Documentation that all required inspections were performed in accordance with the Statement of Special Inspections.

(3) Documentation that the Designated Seismic Systems were installed in accordance with the construction documents and the requirements of Chapter 17, as modified by UFC 3-301-01.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 50 00.05 20

TEMPORARY FACILITIES AND CONTROLS FOR DESIGN-BUILD
11/07

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 WATER WORKS ASSOCIATION (AWWA)

AWWA C511	(2007) Standard for Reduced-Pressure Principle Backflow Prevention Assembly

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR List	(continuously updated) List of Approved Backflow Prevention Assemblies
FCCCHR Manual	(10th Edition) Manual of Cross-Connection Control

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2013; Errata 2015) Standard for Safeguarding Construction,Alteration, and Demolition Operations
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National Electrical Code

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009) Manual on Uniform Traffic Control Devices

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

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Traffic Control Plan; G

SD-03 Product Data

Backflow Preventers

SD-06 Test Reports

Backflow Preventer Tests; G

SD-07 Certificates

Backflow Tester Certification; G

Backflow Preventers Certificate of Full Approval

1.3 EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. These non-construction products contain the highest practicable percentage of recycled or recovered materials and can be recycled when no longer needed.

1.4 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval is not acceptable.

1.4.1 Backflow Prevention Training Certificate

The Contractor must submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

1.5 TEMPORARY UTILITIES

Reasonable amounts of the following utilities will be made available to the Contractor at the prevailing rates.

Electricity	Prevailing Rate
Potable Water	Prevailing Rate

Sanitary Sewer	Prevailing Rate

The point at which the Government will deliver such utilities or services and the quantity available must be coordinated with the Contracting Officer. The Contractor must pay all costs incurred in connecting, converting, and transferring the utilities to the work. The Contractor must make connections, including providing backflow-preventing devices on connections to domestic water lines; providing meters; and providing transformers; and make disconnections.1.6 BACKFLOW TESTER CERTIFICATION

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the regulatory agency. Tester must not be affiliated with any company participating in any other phase of this Contract.

Certified by the City of San Diego.

1.7 WEATHER PROTECTION

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday.

1.7.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

1.7.1.1 Hurricane Condition of Readiness

Unless directed otherwise, comply with:

a. Condition FOUR (Sustained winds of 58 mph or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers all scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 3.3 feet high. Remove all debris, trash, or objects that could become missile hazards. Review requirements pertaining to "Condition THREE" and continue action as necessary to attain "Condition FOUR" readiness. Contact Contracting Officer for Condition Requirements .

b. Condition THREE (Sustained winds of 58 mph or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition TWO" readiness. Cease all routine activities which might interfere with securing operations.

Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Reinforce or remove formwork and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact Contracting Officer for weather and COR updates and completion of required actions.

c. Condition TWO (Sustained winds of 58 mph or greater expected within 24 hours): Secure the jobsite, and leave Government premises.

d. Condition ONE (Sustained winds of 58 mph or greater expected within 12 hours): Contractor access to the jobsite and Government premises is prohibited.

1.8 STATION OPERATION AFFECT ON CONTRACTOR OPERATIONS

1.8.1 Restricted Access Areas

The Government will monitor work in areas indicated. Notify Contracting Officer at least 14 calendar days prior to starting work in these areas.

1.8.2 Special Restrictions Regarding Access of Vehicles and Parking

1.8.2.1 Interruption of Vehicular Traffic

If during the performance of work, it becomes necessary to modify vehicular traffic patterns at any locations, notify the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan must be in accordance with State and local regulations and the MUTCD. Make all notifications and obtain any permits required for modification to traffic movements outside Station's jurisdiction. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

1.9 STORAGE AREAS

Contractor is responsible for security of his property. The Contract Clause entitled "FAR 52.236-10, Operations and Storage Areas" and the following apply:

1.9.1 Storage in Existing Buildings

The Contractor will be working in around existing buildings; the storage of material where indicated . Provide 8 foot high security fence with a lockable gate around the storage area. Remove at the completion of work.

1.10 TEMPORARY SANITARY FACILITIES

Provide adequate sanitary conveniences of a type approved for the use of persons employed on the work, properly secluded from public observation, and maintained in such a manner as required and approved by the Contracting Officer. Maintain these conveniences at all times without nuisance. Upon

completion of the work, remove the conveniences from the premises, leaving the premises clean and free from nuisance. Dispose of sewage offsite and not at the station sanitary sewage system. Use chemical toilets or comparably effective units, and periodically remove waste to a commercial facility. Include provisions for pest control and elimination of odors.

1.11 TEMPORARY BUILDINGS

Temporary facilities (including trailers) must be in like new condition and must be maintained throughout the project. Locate these facilities where directed and within the indicated operations area. Failure to maintain storage trailers or buildings to these standards will result in the removal of non-complying units at the Contractor's expense. A sign not smaller than 24 by 24 inches must be conspicuously placed on the trailer depicting the company name, business phone number, and emergency phone number. Trailers must be anchored to resist high winds and must meet applicable state of local standards for anchoring mobile trailers. Storage of material/debris under such facilities is prohibited. Contractor is responsible for the security of the stored property.

PART 2 PRODUCTS

2.1 BACKFLOW PREVENTERS

Reduced pressure principle type conforming to the applicable requirements AWWA C511. Provide backflow preventers complete with flanged ductile iron, bronze, brass mounted gate valve and strainer, 304 stainless steel or bronze, internal parts. The particular make, model/design, and size of backflow preventers to be installed must be included in the latest edition of the List of Approved Backflow Prevention Assemblies issued by the FCCCHR List and must be accompanied by a Certificate of Full Approval from FCCCHR List.

2.2 PROJECT SIGN

NOTE: Provide project signboard on all MILCON and other significant facility projects.

Prior to initiating any work on site, provide one project identification sign at the location coordinated with the Contracting Officer. Construct the sign in accordance with project sign detail attached at the end of this section. Maintain sign throughout the life of the project. Upon completion of the project, remove the sign from the site. Provide rendering in accordance with Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES.

2.2.1 Project Identification Signboard (Navy)

A project identification signboard must be provided in accordance with attached Plates 1, 3, and 4. The signboard is to be placed at a conspicuous location on the job site where directed by the Contracting Officer.

a. The field of the sign must consist of a minimum of 4 by 8 foot sheet of exterior plywood.

b. The entire signboard and supports must be painted. The lettering and sign work must be performed by a skilled sign painter using paint known in the trade as bulletin colors. The colors, lettering sizes, and lettering styles must be as indicated.

c. NAVFAC logo must be a sticker/decal with either transparent or white background or paint the logo by stencil onto the sign. The weather resistant sticker/decal film must be rated for a minimum of 2-year exterior vertical exposure. NAVFAC Logo is available at: https://portal.navfac.navy.mil/portal/page?_pageid=181,3465071&_dad=portal&_schema=PORTAL

d. Sign paint colors

(1) Blue = To match dark blue color in the NAVFAC logo.

(2) White = To match Brilliant White color in the NAVFAC logo.

PART 3 EXECUTION

3.1 TEMPORARY PHYSICAL CONTROLS

3.1.1 Access Controls

3.1.1.1 Temporary Barricades

Contractor must provide for barricading around all work areas to prevent public access.

3.1.1.2 Fencing

Fencing must be provided along the construction site at all open excavations and tunnels to control access by unauthorized people. Fencing must be installed to be able to restrain a force of at leas 250 pounds against it.

Enclose the project work are and Contractor lay-down area with a 8 ft high fence. Remove the fence upon completion and acceptance of the work. Intent is to block (screen) public view of the construction.

In addition, prior to the start of work, enclose those areas at the construction site which are not within the construction fence with a temporary safety fence, including gates and warning signs, to protect the public from construction activities. The safety fence must match the base standard color (or bright orange where it protects excavated areas), must be made of high density polyethylene grid or approved equal , a minimum of 42 inches high, supported and tightly secured to steel posts located on minimum 10 foot centers. Remove the fence from the work site upon completion of the contract.

3.1.1.3 Signs

Place warning signs at the construction area perimeter designating the presence of construction hazards requiring unauthorized persons to keep out. Signs must be placed on all sides of the project, with at least one sign every 300 feet. All points of entry must have signs designating the construction site as a hard hat area.

3.1.1.4 Traffic Work

All work around/involving roadways, to include roadway excavations and utility crossings,must be conducted in accordance with Manual of Traffic Control Devices. Contractors must provide and ensure appropriate road

closure and detour signs are established as necessary for motor traffic management. All road closures must be coordinated with the Contracting Officer in advance. Self-illuminated (lighted) barricades must be provided during hours of darkness. Brightly-colored (orange) vests are required for all personnel working in roadways. Road closures require a road closure plan showing the location of signage.

3.2 TEMPORARY WIRING

Provide temporary wiring in accordance with NFPA 241 and NFPA 70, Assured Equipment Grounding Conductor Program. Program must include frequent inspection of all equipment and apparatus.

3.3 REDUCED PRESSURE BACKFLOW PREVENTERS

Provide an approved reduced pressure backflow prevention assembly at each location where the Contractor taps into the Government potable water supply.

A certified tester(s) must perform testing of backflow preventer(s) for proper installation and operation and provide subsequent tagging. Backflow preventer tests must be performed using test equipment, procedures, and certification forms conforming to those outlined in the latest edition of the Manual of Cross-Connection Control published by the FCCCHR Manual. Test and tag each reduced pressure backflow preventer upon initial installation (prior to continued water use) and quarterly thereafter. Tag must contain the following information: make, model, serial number, dates of tests, results, maintenance performed, and signature of tester. Record test results on certification forms conforming to requirements cited earlier in this paragraph.

-- End of Section --

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS
11/15

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.

STATE OF HAWAII, DEPARTMENT OF HEALTH (DOH), CLEAN WATER BRANCH (CWB), HAWAII ADMINISTRATIVE RULES (HAR)

DOH HAR 11-55	Water Pollution Control

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846	(Third Edition; Update IV) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

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

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 261.7	Residues of Hazardous Waste in Empty Containers
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 262.31	Standards Applicable to Generators of Hazardous Waste-Labeling
40 CFR 262.34	Standards Applicable to Generators of Hazardous Waste-Accumulation Time
40 CFR 263	Standards Applicable to Transporters of

	Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards For Universal Waste Management
40 CFR 273.2	Standards for Universal Waste Management - Batteries
40 CFR 273.4	Standards for Universal Waste Management - Mercury Containing Equipment
40 CFR 273.5	Standards for Universal Waste Management - Lamps
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 355	Emergency Planning and Notification
40 CFR 403	General Pretreatment Regulations for Existing and New Sources of Pollution
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 64	Compliance Assurance Monitoring
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
40 CFR 761	Polychlorinated Biphenyls (PCBs)

	Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 172.101	Hazardous Material Regulation-Purpose and Use of Hazardous Material Table
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Class I and II Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act. A list of Class I ODS can be found on the EPA website at the following weblink. http://www.epa.gov/ozone/science/ods/classone.html.

Class II ODS is defined in Section 602(s) of The Clean Air Act. A list of Class II ODS can be found on the EPA website at the following weblink. http://www.epa.gov/ozone/science/ods/classtwo.html.

1.2.2 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.2.3 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.2.4 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.2.5 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The

control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.6 Hazardous Debris

As defined in paragraph SOLID WASTE, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that: Is regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.120; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.2.8 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibit a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D.

1.2.9 Land Application

Land Application means spreading or spraying discharge water at a rate that allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Comply with federal, state, and local laws and regulations.

1.2.10 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by installations to obtain NPDES permit coverage for their stormwater discharges.

1.2.11 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.2.12 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, POLs and may be appropriately tested and discarded in a manner which is in compliance with other state and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, perform a hazardous waste determination prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.13 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.2.14 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.15 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.2.15.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.2.15.2 Green Waste

Green waste is the vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not

included.

1.2.15.3 Material not regulated as solid waste

Material not regulated as solid waste is nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.2.15.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 263.

1.2.15.5 Recyclables

Recyclables are materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable, wiring, insulated/non-insulated copper wire cable, wire rope, and structural components. It also includes commercial-grade refrigeration equipment with Freon removed, household appliances where the basic material content is metal, clean polyethylene terephthalate bottles, cooking oil, used fuel oil, textiles, high-grade paper products and corrugated cardboard, stackable pallets in good condition, clean crating material, and clean rubber/vehicle tires. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans that meet the definition of empty containers in accordance with 40 CFR 261.7 may be included as recyclable if sold to a scrap metal company.

1.2.15.6 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

Excess soil generated from construction projects on Navy Region Hawaii Property is not to be given to the Contractor. Excess soil shall disposed of at a permitted landfill that can accept the soil. The Contractor is responsible for performing all required sampling to meet the requirements of the permitted landfill.

If the need exist for reuse of excess soil on government DOD property, the contractor will be notified of such need. With the consent of the DoD property owner and NAVFAC HI Environmental Department, EV4, the contractor may turn over excess soil to the government at a location specified by the contracting officer. Only soil with no known or suspected contaminates, stains or odor shall be reused on DoD property.

The contractor must not assume that the goverment will accept excess soil. The contractor is responsible for all costs associated with sampling, testing and disposing of all excess soils.

1.2.15.7 Scrap Metal

This includes scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe, and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

1.2.15.8 Wood

Wood is dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included. Treated wood includes, but is not limited to, lumber, utility poles, crossties, and other wood products with chemical treatment.

1.2.16 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, creeks or "waters of the United States". Surface discharges are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.2.17 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.2.17.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.2.18 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.2.19 Wetlands

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.2.20 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (for example, thermostats), and lamps (for example, fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Survey

Solid Waste Management Permit; G

Regulatory Notifications; G

Environmental Protection Plan; G

Stormwater Notice of Intent (for NPDES coverage under the general permit for construction activities); G

NPDES Permit Application (for individual permit for construction activities)

Dirt and Dust Control Plan; G

Employee Training Records; G

Environmental Manager Qualifications; G

SD-06 Test Reports

Laboratory Analysis

Inspection Reports

Solid Waste Management Report; G

SD-07 Certificates

Employee Training Records; G

ECATTS Certificate Of Completion; G

Erosion and Sediment Control Inspector Qualifications

SD-11 Closeout Submittals

Stormwater Pollution Prevention Plan Compliance Notebook; G

Stormwater Notice of Cessation (for NPDES coverage under the general permit for construction activities); G

Waste Determination Documentation; G

Disposal Documentation for Hazardous and Regulated Waste; G

Assembled Employee Training Records; G

Solid Waste Management Permit; G

Solid Waste Management Report; G

Contractor Hazardous Material Inventory Log; G

Hazardous Waste/Debris Management; G

Regulatory Notifications; G

Sales Documentation; G

Contractor Certification (when sales documentation is not available)

As-Built Topographic Survey

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.4.1 Training in Environmental Compliance Assessment Training and Tracking System (ECATTS)

1.4.1.1 Personnel Requirements

The Environmental Manager is responsible for environmental compliance on projects. The Environmental Manager and other staff, must complete applicable ECATTS training modules (installation specific or general) prior to starting respective portions of on-site work under this Contract. If personnel changes occur for any of these positions after starting work, replacement personnel must complete applicable ECATTS training within 14 days of assignment to the project.

1.4.1.2 Certification

Submit an ECATTS certificate of completion for personnel who have completed the required ECATTS training. This training is web-based and can be accessed from any computer with Internet access using the following instructions.

Register for NAVFAC Environmental Compliance Training and Tracking System, by logging on to https://environmentaltraining.ecatts.com/. Obtain the

password for registration from the Contracting Officer.

1.4.1.3 Refresher Training

This training has been structured to allow contractor personnel to receive credit under this contract and to carry forward credit to future contracts. Ensure the Environmental Manager review their training plans for new modules or updated training requirements prior to beginning work. Some training modules are tailored for specific state regulatory requirements; therefore, Contractors working in multiple states will be required to retake modules tailored to the state where the contract work is being performed.

1.4.2 Conformance with the Environmental Management System

Perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). Perform work in a manner that conforms to objectives and targets of the environmental programs and operational controls identified by the EMS. Support Government personnel when environmental compliance and EMS audits are conducted by escorting auditors at the Project site, answering questions, and providing proof of records being maintained. Provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, take corrective and preventative actions. In addition, employees must be aware of their roles and responsibilities under the installation EMS and of how these EMS roles and responsibilities affect work performed under the contract.

Coordinate with the installation's EMS coordinator to identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. Provide training documentation to the Contracting Officer. The Installation Environmental Office will retain associated environmental compliance records. Make EMS Awareness training completion certificates available to Government auditors during EMS audits and include the certificates in the Employee Training Records. See paragraph EMPLOYEE TRAINING RECORDS.

1.5 SPECIAL ENVIRONMENTAL REQUIREMENTS

Comply with the special environmental requirements listed in each task order.

1.6 QUALITY ASSURANCE

1.6.1 Preconstruction Survey and Protection of Features

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s),

as applicable. The Contractor and the Contracting Officer will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.6.2 Regulatory Notifications

Provide regulatory notification requirements in accordance with federal, state and local regulations. In cases where the Government will also provide public notification (such as stormwater permitting), coordinate with the Contracting Officer. Submit copies of regulatory notifications to the Contracting Officer within 15 days prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all-inclusive): demolition, renovation, NPDES defined site work, construction, removal or use of a permitted air emissions source, and remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.6.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the installation; and types and quantities of wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and installation Environmental Office to discuss the proposed Environmental Protection Plan (EPP). Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.6.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager is directly responsible for coordinating contractor compliance with federal, state, local, and installation requirements. The Environmental Manager must ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the EPP; ensure environmental permits are obtained, maintained, and closed out; ensure compliance with Stormwater Program requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however, the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out. Submit Environmental Manager Qualifications to the Contracting Officer.

1.6.5 Employee Training Records

Prepare and maintain Employee Training Records throughout the term of the

contract meeting applicable 40 CFR requirements. Provide Employee Training Records in the Environmental Records Binder. Ensure every employee completes a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures compliance with federal, state and local regulatory requirements for RCRA Large Quantity Generator. Provide a Position Description for each employee, by subcontractor, based on the Davis-Bacon Wage Rate designation or other equivalent method, evaluating the employee's association with hazardous and regulated wastes. This Position Description will include training requirements as defined in 40 CFR 265 for a Large Quantity Generator facility. Submit these Assembled Employee Training Records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

Train personnel to meet state requirements. Conduct environmental protection/pollution control meetings for personnel prior to commencing construction activities. Contact additional meetings for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, waters of the United States, and endangered species and their habitat that are known to be in the area.

1.6.6 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.7 ENVIRONMENTAL PROTECTION PLAN

The purpose of the EPP is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Incorporate construction related objectives and targets from the installation's EMS into the EPP. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer or Contracting Officer Representative to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Submit the EPP within 15 days after Contract award and not less than 10 days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations.

During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.7.1 General Overview and Purpose

1.7.1.1 Descriptions

A brief description of each specific plan required by environmental permit or elsewhere in this Contract such as stormwater pollution prevention plan, spill control plan, solid waste management plan, wastewater management plan, air pollution control plan, contaminant prevention plan, a historical, archaeological, cultural resources, biological resources and wetlands plan, traffic control plan Hazardous, Toxic and Radioactive Waste (HTRW) Plan, Non-Hazardous Solid Waste Disposal Plan, borrowing material plan, or any other plan required per task order.

1.7.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.7.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.7.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.7.1.5 Contact Information

Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

1.7.2 General Site Information

1.7.2.1 Drawings

Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, jurisdictional wetlands, material storage areas, structures, sanitary facilities, storm drains and conveyances, and stockpiles of excess soil.

1.7.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for

marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

1.7.2.3 Documentation

A letter signed by an officer of the firm appointing the Environmental Manager and stating that person is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

1.7.3 Management of Natural Resources

a. Land resources

b. Tree protection

c. Replacement of damaged landscape features

d. Temporary construction

e. Stream crossings

f. Fish and wildlife resources

g. Wetland areas

1.7.4 Protection of Historical and Archaeological Resources

a. Objectives

b. Methods

1.7.5 Stormwater Management and Control

a. Ground cover

b. Erodible soils

c. Temporary measures

(1) Structural Practices

(2) Temporary and permanent stabilization

d. Effective selection, implementation and maintenance of Best Management Practices (BMPs).

1.7.6 Protection of the Environment from Waste Derived from Contractor Operations

Control and disposal of solid and sanitary waste. Control and disposal of hazardous waste.

This item consist of the management procedures for hazardous waste to be generated. The elements of those procedures will coincide with the Installation Hazardous Waste Management Plan. The Contracting Officer will provide a copy of the Installation Hazardous Waste Management Plan. As a

minimum, include the following:

a. List of the types of hazardous wastes expected to be generated

b. Procedures to ensure a written waste determination is made for appropriate wastes that are to be generated

c. Sampling/analysis plan, including laboratory method(s) that will be used for waste determinations and copies of relevant laboratory certifications

d. Methods and proposed locations for hazardous waste accumulation/storage (that is, in tanks or containers)

e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted)

f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)

g. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar

h. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures

i. Plans for the disposal of hazardous waste by permitted facilities; and Procedures to be employed to ensure required employee training records are maintained.

1.7.7 Prevention of Releases to the Environment

Procedures to prevent releases to the environment

Notifications in the event of a release to the environment

1.7.8 Regulatory Notification and Permits

List what notifications and permit applications must be made. Some permits require up to 180 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

1.7.9 Clean Air Act Compliance

1.7.9.1 Haul Route

Submit truck and material haul routes along with a Dirt and Dust Control Plan for controlling dirt, debris, and dust on Installation roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

1.7.9.2 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Determine requirements based on any current installation permits and the impacts of

the project. Provide a list of all fixed or mobile equipment, machinery or operations that could generate air emissions during the project to the Installation Environmental Office (Air Program Manager).

1.7.9.3 Stationary Internal Combustion Engines

Identify portable and stationary internal combustion engines that will be supplied, used or serviced. Comply with 40 CFR 60 Subpart IIII, 40 CFR 60 Subpart JJJJ, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine brake horsepower), and EPA emission certification status of each engine. Maintain applicable records and log hours of operation and fuel use. Logs must include reasons for operation and delineate between emergency and non-emergency operation.

1.7.9.4 Refrigerants

Identify management practices to ensure that heating, ventilation, and air conditioning (HVAC) work involving refrigerants complies with 40 CFR 82 requirements. Technicians must be certified, maintain copies of certification on site, use certified equipment and log work that requires the addition or removal of refrigerant. Any refrigerant reclaimed is the property of the Government, coordinate with the Installation Environmental Office to determine the appropriate turn in location.

1.7.9.5 Air Pollution-engineering Processes

Identify planned air pollution-generating processes and management control measures (including, but not limited to, spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions). Log hours of operations and track quantities of materials used.

1.7.9.6 Compliant Materials

Provide the Government a list of and SDSs for all hazardous materials proposed for use on site. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements. The Government may alter or limit use of specific materials as needed to meet installation permit requirements for emissions.

1.8 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7. Notify the Government of all general use permitted equipment the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7.

See the task order for permits, if any, that have been or will be obtained by the Government.

1.9 ENVIRONMENTAL RECORDS BINDER

Maintain on-site a separate three-ring Environmental Records Binder and submit at the completion of the project. Make separate parts within the binder that correspond to each submittal listed under paragraph CLOSEOUT SUBMITTALS in this section.

1.10 SOLID WASTE MANAGEMENT PERMIT

Provide the Contracting Officer with written notification of the quantity of anticipated solid waste or debris that is anticipated or estimated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance from the receiving location or as applicable; submit one copy of the receiving location state and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

1.10.1 Solid Waste Management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

1.11 FACILITY HAZARDOUS WASTE GENERATOR STATUS

Joint Base Pearl Harbor Hickam and Marine Corp Base Hawaii are designated as a Large Quantity Generator. Meet the regulatory requirements of this generator designation for any work conducted within the boundaries of this Installation. Comply with provisions of federal, state, and local regulatory requirements applicable to this generator status regarding training and storage, handling, and disposal of construction derived wastes.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult with the Installation Environmental Office, regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of the Installation Environmental Office or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.1.2 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do

not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer and Installation Environmental Office to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.1.3 Streams

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with any required permits including, but not limited to, Clean Water Act Section 404, and Section 401 Water Quality.

The Contracting Officer's approval and appropriate permits are required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.2 STORMWATER

Do not discharge stormwater from construction sites to the sanitary sewer. If the water is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization in advance from the Installation Environmental Office for any release of contaminated water.

3.2.1 NPDES Permit Coverage for Construction Storm Water

The contractor is responsible for compliance with National Pollutant Discharge Elimination System permit(s) as required by the State of Hawaii Department of Health Clean Water Branch's (DOH-CWB's) requirements and DOH HAR 11-55.

If the project involves any land disturbance (regardless of acreage), the contractor must contact the Installation Environmental Office to determine whether NPDES Notice of Intent (for general permit) or Permit Application (for individual permit) coverage is required. If the Government determines that NPDES permit coverage is required, the Contractor shall prepare the Notice of Intent (NOI) or Permit Application and all required attachments, for coverage under the State of Hawaii's general NPDES permit or Individual Permit in accordance with Hawaii Administrative Rules, HAR 11-55, Appendix C - NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activities or conditions contained in the issued individual permit, and State of Hawaii guidelines. If non-storm water (e.g., construction dewatering, hydrotesting/ disinfecting water, well drilling process wastewater, etc.) will be discharged into the storm drainage system or a water body, the Contractor must prepare an NOI and all required attachments, for coverage under the appropriate State general NPDES

permit(s) in accordance with HAR 11-55.

Under the terms and conditions of the permit, install, inspect, maintain BMPs, prepare and submit SWPPP inspection reports. Maintain construction operations and management in compliance with the terms and conditions of the general or individual permit (as applicable) for stormwater discharges from construction activities.

3.2.1.1 Stormwater Pollution Prevention Plan

Submit a project-specific Stormwater Pollution Prevention Plan (SWPPP) to the Contracting Officer for approval with the NOI or Application described below. The SWPPP must meet the requirements of DOH-CWB HAR 11-55 or conditions contained in the issued individual permit for stormwater discharges from construction sites.

Include the following:

a. Comply with terms of the State's general or individual permit for discharge of stormwater associated with construction activities. Prepare SWPPP in accordance with State requirements. Use the DOH-CWB website for additional guidence: http://health.hawaii.gov/cwb

b. Select applicable BMPs from EPA Fact Sheets located at http://water.epa.gov/polwaste/npdes/swbmp/Construction-Site-StormWater-Run-Off-Control.cfm or in accordance with applicable state or local requirements.

3.2.1.2 Stormwater Notice of Intent and NPDES Permit Application for Construction Activities

Prepare and submit a Notice of Intent for NPDES coverage under the State of Hawaii's NPDES general permit authorizing discharges of storm water associated with contruction activity (HAR 11-55, Appendix C) or Permit Application for individual NPDES permit for discharges of storm water associated with construction activity in accordance with HAR 11-55 and State of Hawaii guidelines to the Contracting Officer for review and approval.

For JBPHH projects, the contractor must submit the contractor prepared Storm Water Notice of Intent or Permit Application package (including the Storm Water Pollution Prevention Plan (SWPPP) and draft on-line e-Permitting submittal) and filing fees for government review a minimum of 210 calendar days for general permit applications and a minimum 270 calendar days for individual permit applications prior to start of the permitted activity. The Contractor is responsible for responding to comments from the Government and the State DOH-CWB. The Government will submit the complete NOI or Application package to DOH-CWB. Upon permit issuance from the DOH-CWB, the Government, as permit holder, will coordinate all issues pertaining to the permit(s) with the State DOH-CWB. The Contractor shall not begin any land disturbing activities or discharges of non-storm water until coverage under the appropriate permit has been issued by DOH-CWB and erosion controls and other BMPs have been implemented.

For MCBH projects, the contractor must submit the contractor prepared Storm Water Notice of Intent or Permit Application (for NPDES coverage under the permit for construction activities) and Storm Water Pollution Prevention Plan (SWPPP) for the project to the MCBH Environmental Office for review. The Contractor is responsible for responding to comments from the

Government. When all comments from the Government have been resolved, the Contractor will submit the completed NOI or Application package(s) (including the Storm Water Pollution Prevention Plan (SWPPP) and draft on-line e-Permitting submittal) and filing fees to State of Hawaii DOH-CWB for review and approval. The Contractor shall work directly with State DOH-CWB for all issues pertaining to the permit, until permit is approved and issued by State DOH-CWB.

For Individual permits, the Contractor shall also be responsible for coordinating and paying for the required notice for the 30-day public review period for individual NPDES permit(s). The Contractor is responsible for responding to comments from the Government.

No land disturbing activities may commence without permit coverage. Maintain an approved copy of the SWPPP at the onsite construction office, and continually update as regulations require, reflecting current site conditions.

Comply with the additional requirements in Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS.

3.2.1.3 Inspection Reports

Submit "Inspection Reports" to the Contracting Officer in accordance with the State of HawaiiConstruction General Permit. Provide Inspection Reports in accordance with 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS.

3.2.1.4 Stormwater Pollution Prevention Plan Compliance Notebook

Create and maintain a three ring binder of documents that demonstrate compliance with the NPDES permit. Include a copy of the permit Notice of Intent or NPDES permit application, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports and related corrective action records, other permit-required reports and records, and copies of permit-related correspondence. At project completion, the notebook becomes property of the Government. Provide the compliance notebook to the Contracting Officer.

3.2.1.5 Stormwater Notice of Cessation for Construction Activities

Submit a Notice of Cessation to the Contracting Officer for approval once construction is complete and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Respond to any comments from the Government. Once approved, the Government shall certify the Notice of Cessation for submittal to the HDOH-CWB, by the contractor.

3.2.2 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

Erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports.

3.2.2.1 Erosion Control

Prevent erosion by mulching, Compost Blankets, Geotextiles, temporary slope drains, or as defined by each task order. Stabilize slopes by chemical stabilization, sodding, seeding, or such combination of these methods necessary for effective erosion control. Use of hay bales is prohibited.

Provide seeding in accordance with Section 32 92 19 SEEDING.

3.2.2.2 Sediment Control Practices

Implement sediment control practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Implement sediment control practices prior to soil disturbance and prior to creating areas with concentrated flow, during the construction process to minimize erosion and sediment laden runoff. Include devices such as silt fences, temporary diversion dikes, storm drain inlet protection, or any other approved method to maximize control of sediment runoff. Location and details of installation and construction are indicated on the drawings.

3.2.3 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area that are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. Personnel must be knowledgeable of the purpose for marking and protecting particular objects.

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Move or relocate the Contractor facilities only when approved by the Government. Provide erosion and sediment controls for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant or work areas to protect adjacent areas.

3.2.5 Municipal Separate Storm Sewer System (MS4) Management

Comply with the Installation's MS4 permit requirements.

3.3 SURFACE AND GROUNDWATER

3.3.1 Cofferdams, Diversions, and Dewatering

Construction operations for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure must be constantly controlled to maintain compliance with existing state water quality standards and designated uses of the surface water body. Comply with the State of Hawaii Clean Water Branch water quality standards and anti-degradation provisions and the Clean Water Act Section 404, Nation Wide Permits applicable to the task order. Do not discharge excavation ground water to the sanitary sewer, storm drains, or to surface waters without prior specific authorization in writing from the Installation Environmental Office. Discharge of hazardous substances will not be permitted under any circumstances. Use sediment

control BMPs to prevent construction site runoff from directly entering any storm drain or surface waters.

If the construction dewatering is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization for any contaminated groundwater release in advance from the Installation Environmental Officer and the federal or state authority, as applicable. Discharge of hazardous substances will not be permitted under any circumstances.

3.3.2 Waters of the United States

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States except as authorized within each task order. The protection of waters of the United States shown on the drawings in accordance with paragraph LICENSES AND PERMITS is the Contractor's responsibility. Authorization to enter specific waters of the United States identified does not relieve the Contractor from any obligation to protect other waters of the United States within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 PROTECTION OF CULTURAL RESOURCES

3.4.1 Archaeological Resources

Existing archaeological resources within the work area are shown on the drawings. Protect these resources and be responsible for their preservation during the life of the Contract. If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include, but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

3.4.2 Historical Resources

Existing historical resources within the work area are shown on the drawings. Protect these resources and be responsible for their preservation during the life of the Contract.

3.5 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with 40 CFR 64 and state air emission and performance laws and standards.

3.5.1 Preconstruction Air Permits

Notify the Air Program Manager, through the Contracting Officer, at least 6 months prior to bringing equipment, assembled or unassembled, onto the

Installation, so that air permits can be secured. Necessary permitting time must be considered in regard to construction activities. Clean Air Act (CAA) permits must be obtained prior to bringing equipment, assembled or unassembled, onto the Installation.

Confirm that these permits have been obtained.

3.5.2 Oil or Dual-fuel Boilers and Furnaces

Provide product data and details for new, replacement, or relocated fuel fired boilers, heaters, or furnaces to the Installation Environmental Office (Air Program Manager) through the Contracting Officer. Data to be reported include: equipment purpose (water heater, building heat, process), manufacturer, model number, serial number, fuel type (oil type, gas type) size (MMBTU heat input). Provide in accordance with paragraph PRECONSTRUCTION AIR PERMITS.

3.5.3 Burning

Burning is prohibited on the Government premises.

3.5.4 Class I and II ODS Prohibition

Class I and II ODS are Government property and must be returned to the Government for appropriate management. Coordinate with the Installation Environmental Office to determine the appropriate location for turn in of all reclaimed refrigerant.

3.5.5 Accidental Venting of Refrigerant

Accidental venting of a refrigerant is a release and must be reported immediately to the Contracting Officer.

3.5.6 EPA Certification Requirements

Heating and air conditioning technicians must be certified through an EPA-approved program. Maintain copies of certifications at the employees' places of business; technicians must carry certification wallet cards, as provided by environmental law.

3.5.7 Dust Control

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.5.7.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities, and processing and preparation of materials (such as from asphaltic batch plants) must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or

outside the project boundaries free from particulates that would exceed 40 CFR 50, state, and local air pollution standards or that would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.5.7.2 Abrasive Blasting

Blasting operations cannot be performed without prior approval of the Installation Air Program Manager. The use of silica sand is prohibited in sandblasting.

Provide tarpaulin drop cloths and windscreens to enclose abrasive blasting operations to confine and collect dust, abrasive agent, paint chips, and other debris. Perform work involving removal of hazardous material in accordance with 29 CFR 1910.

3.5.8 Odors

Control odors from construction activities. The odors must be in compliance with state regulations and local ordinances and may not constitute a health hazard.

3.6 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Obtain a copy of the installation's Pollution Prevention/Hazardous Waste Minimization Plan for reference material when preparing this part of the EPP. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information.

3.6.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, all scrap metal must be sent for reuse or recycling and will not be disposed of in a landfill.

Include the name, physical address, and telephone number of the hauler, if transported by a franchised solid waste hauler. Include the destination and, unless exempted, provide a copy of the state or local permit (cover) or license for recycling.

3.6.2 Nonhazardous Solid Waste Diversion Report

Maintain an inventory of nonhazardous solid waste diversion and disposal of construction and demolition debris. Submit a report to NAVFAC Hawaii, EV4 through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that nonhazardous solid waste has been generated. Include the following in the report:

Construction and Demolition (C&D) Debris Disposed	cubic yards, tons, cubic meters as appropriate
C&D Debris Recycled	cubic yards, tons, cubic meters as appropriate
Total C&D Debris Generated	cubic yards, tons, cubic meters as appropriate
Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount)	cubic yards, tons, cubic meters as appropriate

3.7 WASTE MANAGEMENT AND DISPOSAL

3.7.1 Waste Determination Documentation

Complete a Waste Determination form (provided at the pre-construction conference) for Contractor-derived wastes to be generated. All potentially hazardous solid waste streams that are not subject to a specific exclusion or exemption from the hazardous waste regulations (e.g. scrap metal, domestic sewage) or subject to special rules, (lead-acid batteries and precious metals) must be characterized in accordance with the requirements of 40 CFR 261 or corresponding applicable state or local regulations. Base waste determination on user knowledge of the processes and materials used, and analytical data when necessary. Consult with the Installation environmental staff for guidance on specific requirements. Attach support documentation to the Waste Determination form. As a minimum, provide a Waste Determination form for the following waste (this listing is not inclusive): oil- and latex -based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and containers of the original materials.

3.7.1.1 Sampling and Analysis of Waste

3.7.1.1.1 Waste Sampling

Sample waste in accordance with EPA SW-846. Clearly mark each sampled drum or container with the Contractor's identification number, and cross reference to the chemical analysis performed.

3.7.1.1.2 Laboratory Analysis

Follow the analytical procedure and methods in accordance with the 40 CFR 261. Provide analytical results and reports performed to the Contracting Officer.

3.7.1.1.3 Analysis Type

Identify hazardous waste by analyzing for the following characteristics: ignitability, corrosivity, reactivity, toxicity based on TCLP results.

3.7.2 Solid Waste Management

3.7.2.1 Solid Waste Management Report

Provide copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, a statement indicating the disposal location for the solid waste that is signed by an employee authorized to legally obligate or bind the firm may be submitted. The sales documentation (or Contractor certification when sales documentation is not available) must include the receiver's tax identification number and business, EPA or state registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained for the Contractor's own use, submit the information previously described in this paragraph on the solid waste disposal report. Prices paid or received do not have to be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.7.2.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with non-hazardous solid waste. Transport solid waste off Government property and dispose of it in compliance with 40 CFR 260, state, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill is the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Where allowable under each task order, haul waste materials to the Government landfill site as shown on the drawings or as designated by the Contracting Officer. Comply with site procedures. Segregate and separate treated wood components disposed at a lined landfill approved to accept this waste in accordance with local and state regulations Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, in accordance with 49 CFR 173.

3.7.3 Control and Management of Hazardous Waste

Do not dispose of hazardous waste on Government property. Do not discharge any waste to a sanitary sewer, storm drain, or to surface waters or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer.

3.7.3.1 Hazardous Waste/Debris Management

Identify construction activities that will generate hazardous waste or debris. Provide a documented waste determination for resultant waste streams. Identify, label, handle, store, and dispose of hazardous waste or debris in accordance with federal, state, and local regulations, including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Manage hazardous waste in accordance with the approved Hazardous Waste Management Section of the EPP. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities is identified as being generated by the Government. Prior to removal of any hazardous waste from Government property, hazardous waste manifests must be signed by personnel from the Installation Environmental Office. Do not bring hazardous waste onto Government property. Provide the Contracting Officer with a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D.

3.7.3.2 Waste Storage/Satellite Accumulation/90 Day Storage Areas

Accumulate hazardous waste at satellite accumulation points and in compliance with 40 CFR 262.34 and applicable state or local regulations. Individual waste streams will be limited to 55 gallons of accumulation (or 1 quart for acutely hazardous wastes). If the Contractor expects to generate hazardous waste at a rate and quantity that makes satellite accumulation impractical, the Contractor may request a temporary 90 day accumulation point be established. Submit a request in writing to the Contracting Officer and provide the following information (Attach Site Plan to the Request):

Contract Number	
Contractor	
Haz/Waste or Regulated Waste POC	
Phone Number	
Type of Waste	
Source of Waste	
Emergency POC	
Phone Number	
Location of the Site	

Attach a Waste Determination form for the expected waste streams. Allow 10 working days for processing this request. Additional compliance requirements (e.g. training and contingency planning) that may be required are the responsibility of the Contractor. Barricade the designated area where waste is being stored and post a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.7.3.3 Hazardous Waste Disposal

3.7.3.3.1 Responsibilities for Contractor's Disposal

Provide hazardous waste manifest to the Installations Environmental Office for review, approval, and signature prior to shipping waste off Government property.

3.7.3.3.1.1 Services

Provide service necessary for the final treatment or disposal of the hazardous material or waste in accordance with 40 CFR 260, local, and state, laws and regulations, and the terms and conditions of the Contract within 60 days after the materials have been generated. These services include necessary personnel, labor, transportation, packaging, detailed analysis (if required for disposal or transportation, include manifesting or complete waste profile sheets, equipment, and compile documentation).

3.7.3.3.1.2 Samples

Obtain a representative sample of the material generated for each job done to provide waste stream determination.

3.7.3.3.1.3 Analysis

Analyze each sample taken and provide analytical results to the Contracting Officer. See paragraph WASTE DETERMINATION DOCUMENTATION.

3.7.3.3.1.4 Labeling

Determine the Department of Transportation's (DOT's) proper shipping names for waste (each container requiring disposal) and demonstrate to the Contracting Officer how this determination is developed and supported by the sampling and analysis requirements contained herein. Label all containers of hazardous waste with the words "Hazardous Waste" or other words to describe the contents of the container in accordance with 40 CFR 262.31 and applicable state or local regulations.

3.7.3.3.2 Contractor Disposal Turn-In Requirements

Hazardous waste generated must be disposed of in accordance with the following conditions to meet installation requirements:

a. Drums must be compatible with waste contents and drums must meet DOT requirements for 49 CFR 173 for transportation of materials.

b. Band drums to wooden pallets.

c. No more than three 55 gallon drums or two 85 gallon over packs are to be banded to a pallet.

d. Band using 1-1/4 inch minimum band on upper third of drum.

e. Provide label in accordance with 49 CFR 172.101.

f. Leave 3 to 5 inches of empty space above volume of material.

3.7.3.4 Universal Waste Management

Manage the following categories of universal waste in accordance with federal, state, and local requirements and installation instructions:

a. Batteries as described in 40 CFR 273.2

b. Lamps as described in 40 CFR 273.5

c. Mercury-containing equipment as described in 40 CFR 273.4

d. Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS

Mercury is prohibited in the construction of this facility, unless specified otherwise, and with the exception of mercury vapor lamps and fluorescent lamps. Dumping of mercury-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited. Remove without breaking, pack to prevent breakage, and transport out of the activity in an unbroken condition for disposal as directed.

3.7.3.5 Electronics End-of-Life Management

Recycle or dispose of electronics waste, including, but not limited to, used electronic devices such computers, monitors, hard-copy devices, televisions, mobile devices, in accordance with 40 CFR 260-262, state, and local requirements, and installation instructions.

3.7.3.6 Disposal Documentation for Hazardous and Regulated Waste

Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or state permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifests must be reviewed, signed, and approved by the Contracting Officer before the Contractor may ship waste. To obtain specific disposal instructions, coordinate with the Installation Environmental Office. Refer to Section 01 57 19.01 20 SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS for the Installation Point of Contact information.

3.7.4 Releases/Spills of Oil and Hazardous Substances

3.7.4.1 Response and Notifications

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Installation Fire Department, the Installation Command Duty Officer, the Installation Environmental Office, the Contracting Officer and the state or local authority.

Submit verbal and written notifications as required by the federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 days. Spill response must be in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills without cost to the Government.

3.7.4.2 Clean Up

Clean up hazardous and non-hazardous waste spills. Reimburse the Government for costs incurred including sample analysis materials,

clothing, equipment, and labor if the Government will initiate its own spill cleanup procedures, for Contractor- responsible spills, when: Spill cleanup procedures have not begun within one hour of spill discovery/occurrence; or, in the Government's judgment, spill cleanup is inadequate and the spill remains a threat to human health or the environment.

3.7.5 Mercury Materials

Immediately report to the Environmental Office and the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Do not recycle a mercury spill cleanup; manage it as a hazardous waste for disposal.

3.7.6 Wastewater

3.7.6.1 Disposal of wastewater must be as specified below.

3.7.6.1.1 Treatment

Do not allow wastewater from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, and forms to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction- related waste water off-Government property in accordance with 40 CFR 403, state, regional, and local laws and regulations.

3.7.6.1.2 Surface Discharge

For discharge of ground water, obtain a state or federal permit specific for pumping and discharging ground water prior to surface discharging. Surface discharge in accordance with federal, state, and local laws and regulations. Surface discharge in accordance with the requirements of the NPDES or state STORMWATER DISCHARGES FROM CONSTRUCTION SITES permit.

3.7.6.1.3 Land Application

Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing be land-applied in accordance with federal, state, and local laws and regulations for land application. Discharge of these waters is not permitted into the Navy’s wastewater collection system

3.8 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan, in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto Government property that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the installation. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have

National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261.

3.8.1 Contractor Hazardous Material Inventory Log

Submit the "Contractor Hazardous Material Inventory Log"(found at: http://www.wbdg.org/ccb/NAVGRAPH/graphtoc.pdf), which provides information required by (EPCRA Sections 312 and 313) along with corresponding SDS, to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Keep copies of the SDSs for hazardous materials onsite. At the end of the project, provide the Contracting Officer with copies of the SDSs, and the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used.

The Contracting Officer may request documentation for any spills or releases, environmental reports, or off-site transfers.

3.9 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.10 CONTROL AND MANAGEMENT OF ASBESTOS-CONTAINING MATERIAL (ACM)

Manage and dispose of asbestos-containing waste in accordance with 40 CFR 61. Refer to Section 02 82 13.00 10 ASBESTOS ABATEMENT IN SCHOOLS (K-12) BUILDINGSSection 02 82 16.00 20 ASBESTOS ABATEMENT IN NON-SCHOOL (K-12) BUILDING. Manifest asbestos-containing waste and provide the manifest to the Contracting Officer. Notifications to the state and Installation Air Program Manager are required before starting any asbestos work.

3.11 CONTROL AND MANAGEMENT OF LEAD-BASED PAINT (LBP)

Manage and dispose of lead-contaminated waste in accordance with 40 CFR 745 and Section 02 82 33.13 20 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD; Section 02 83 13.00 20 LEAD IN CONSTRUCTION; Section 02 83 19.00 10 LEAD BASED PAINT HAZARD ABATEMENT, TARGET HOUSING AND CHILD OCCUPIED FACILITIES. Manifest any lead-contaminated waste and provide the manifest to the Contracting Officer.

3.12 CONTROL AND MANAGEMENT OF POLYCHLORINATED BIPHENYLS (PCBS)

Manage and dispose of PCB-contaminated waste in accordance with 40 CFR 761 and Section 02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBS).

3.13 CONTROL AND MANAGEMENT OF LIGHTING BALLAST AND LAMPS CONTAINING PCBS

Manage and dispose of contaminated waste in accordance with 40 CFR 761. Refer to Section 02 84 16 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBS AND MERCURY.

3.14 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, immediately stop work in that area and immediately inform the Contracting Officer.

3.15 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided. Storage of fuel on the project site must be in accordance with EPA, state, and local laws and regulations and paragraph OIL STORAGE INCLUDING FUEL TANKS.

3.15.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.15.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours that no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a SPCC plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the installation for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.16 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

If petroleum-contaminated soil, or suspected hazardous waste is found during construction that was not identified in the Contract documents, immediately notify the Contracting Officer. Do not disturb this material until authorized by the Contracting Officer.

3.17 CHLORDANE

Evaluate excess soils and concrete foundation debris generated during the demolition of housing units or other wooden structures for the presence of chlordane or other pesticides prior to reuse or final disposal.

3.18 SOUND INTRUSION

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives are not permitted without written permission from the Contracting Officer, and then only during the designated times. Confine pile-driving operations to the period between 8 a.m. and 4 p.m., Monday through Friday, exclusive of holidays, unless otherwise specified.

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State of Hawaii rules.

3.19 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

-- End of Section --

SECTION 01 57 19.01 20

SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS
11/15

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Storage Material Inventory; G

1.2 PACIFIC

Comply with the following state, regional and local requirements which supplement Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

1.2.1 Control and Disposal of Ionization Smoke Detectors and Tritium Exit Signs

1.2.1.1 Material Bagging

Remove existing ionization smoke detectors and tritium exit signs, and place like types, together (that is same manufacturer and model number) in a plastic bag. Label the bag with the following data:

Manufacturer: Activity:
MODEL No.: Contract No.:
Isotope and Quantity (if known):

1.2.1.2 Material Storage

Store plastic bags in 55 gallon covered drum(s). Do not seal the drum(s). Provide a label with a description of the contents and note on the label "TO BE DISPOSED OF BY RASO". Apply the label to the exterior surface of the cover and site of the drum(s). Provide a record copy of the label for each drum storage material inventory to the Contracting Officer, the RASO at COMNAVREG Pearl Harbor, and NAVFAC Hawaii Environmental Department EV4.

1.2.1.3 Storage Site and Disposal

Where permissable under the terms of each task order, deliver drums to MCBH Bunker 709, Sumner Road for storage and disposal of ionization smoke detectors and tritium exit signs as directed by the Contracting Officer.

1.2.1.4 Storage and Disposal by Contractor

Store of ionization smoke detectors and tritium exit signs in accordance

with federal, state, and local laws and regulations.

1.2.2 Hawaii

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 74 19.05 20

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT FOR DESIGN-BUILD
03/15

PART 1 GENERAL

1.1 GOVERNMENT POLICY

Military installations are required to direct at least 60 percent of their non-hazardous solid wastes (including waste from construction and demolition operations) from the waste stream. This guide specification requires the reduction of the amount of construction and demolition waste requiring landfill disposal or incineration, and to promote more efficient use of construction materials during construction.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29.05 20 SUSTAINABILITY REPORTING FOR DESIGN-BUILD. Submit the following in accordance with Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Management Plan; G

SD-11 Closeout Submittals

Records; S

1.3 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, disposal must be in accordance with the following:

1.3.1 Recycle

Recycle waste materials not suitable for reuse, but are recyclable.

1.3.2 Waste

Dispose of materials with no practical use or economic benefit to waste-to-energy plants where available. As the last choice, dispose of materials at a landfill or incinerator.

1.3.3 Return

Set aside and protect mis-delivered and substandard products and materials and return to supplier for credit.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 WASTE MANAGEMENT PLAN

Submit a waste management plan within 15 days after contract award and not less than 10 days before the preconstruction meeting and prior to initiating any site preparation work. The plan must demonstrate how the project waste diversion goal is met and plan must include the following:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.

c. Description of the regular meetings to be help to address waste management.

d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.

e. Characterization, including estimate types and quantities, of the waste to be generated.

f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.

g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.

h. List of specific waste materials that will be salvaged for resale, salvaged and reused, or recycled. Identify recycling facilities that will be used. Provide percentage of non-hazardous construction and demolition waste materials that have been diverted from the waste stream.

i. Identification of materials that cannot be recycled/reused with an explanation or justification.

j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.

k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

l. Anticipated net cost savings determined by subtracting Contractor

program management costs and the cost of disposal from the revenue generated by sale of the materials and the incinerationor landfill cost avoidance.

m. Actions that will be taken to divert at least the required amount of non-hazardous solid wastes (including waste from construction and demolition operations) from the waste stream. Report actual diversion rates during construction and demolition.

n. Identification of base, local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity.

3.2 RECORDS

Maintained records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Report with monthly invoicing the tons diverted, the tons sent to the landfill, cost for each, and the monthly diversion rate. Make the records available to the Contracting Officer during construction, and a copy of the records must be delivered to the Contracting Officer upon completion of the construction and included in the Sustainability Notebook.

-- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS
08/11

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.

ASTM INTERNATIONAL (ASTM)

ASTM E1971	(2005; R 2011) Stewardship for the Cleaning of Commercial and Institutional Buildings

GREEN SEAL (GS)

GS-37	(2012) Cleaning Products for Industrial and Institutional Use

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014) Navy and Marine Corps Design Procedures

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are developed and maintained by the Contractor and depict actual conditions, including deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to Contractor submitted Requests for Information; direction from the Contracting Officer; designs which are the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site. As-built drawings are further defined in NFAS 5252.236-9310. These files serve as the basis for the creation of the record drawings.

1.2.2 Record Drawings

The record drawings are the final compilation of actual conditions reflected in the as-built drawings.

1.3 SOURCE DRAWING FILES

Request the full set of electronic drawings, in the source format, for Record Drawing preparation, after award and at least 30 days prior to required use.

1.3.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose

other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction drawings and data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Warranty Management Plan
Warranty Tags
Final Cleaning
Spare Parts Data

SD-08 Manufacturer's Instructions

Posted Instructions

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals; G

SD-11 Closeout Submittals

As-Built Drawings; G
Record Drawings; G
As-Built Record of Equipment and Materials

Final Approved Shop Drawings
Construction Contract Specifications
Certification of EPA Designated Items; G
Interim DD FORM 1354; G
Checklist for DD FORM 1354; G
NAVFAC Sustainable & Energy Data Record Card; G

1.5 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

1.6 WARRANTY MANAGEMENT

1.6.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit one set of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Include within the warranty management plan , but not limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

c. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

d. A list for each warranted equipment, item, feature of construction or system indicating:

(1) Name of item.
(2) Model and serial numbers.
(3) Location where installed.
(4) Name and phone numbers of manufacturers or suppliers.

(5) Names, addresses and telephone numbers of sources of spare parts.
(6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
(7) Cross-reference to warranty certificates as applicable.
(8) Starting point and duration of warranty period.
(9) Summary of maintenance procedures required to continue the warranty in force.
(10) Cross-reference to specific pertinent Operation and Maintenance manuals.
(11) Organization, names and phone numbers of persons to call for warranty service.
(12) Typical response time and repair time expected for various warranted equipment.

e. The plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

f. Procedure and status of tagging of all equipment covered by extended warranties.

g. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.6.2 Performance Bond

The Performance Bond must remain effective throughout the construction period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.6.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed

and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.6.4 Warranty Tags

At the time of installation, tag each warranted item with a durable, oil and water resistant tag approved by the Contracting Officer. Attach each tag with a copper wire and spray with a silicone waterproof coating. Also, submit two record copies of the warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

Type of product/material	
Model number	
Serial number	
Contract number	
Warranty period from/to	
Inspector's signature	
Construction Contractor	
Address	
Telephone number	
Warranty contact	
Address	
Telephone number	
Warranty response time priority code	
WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.	

PART 2 PRODUCTS

2.1 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items". Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials:

1) The product does not meet appropriate performance standards;
2) The product is not available within a reasonable time frame;
3) The product is not available competitively (from two or more sources);
4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product)."

Record each product used in the project that has a requirement or option of containing recycled or biobased content in accordance with SECTION 01 33 29 SUSTAINABILITY REPORTING, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, total value of biobased content, exemptions (1, 2, 3, or 4, as indicated), and comments. Recycled and biobased content values may be determined by weight or volume percent, but must be consistent throughout.

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

Provide and maintain As-Built Drawings in accordance with NFAS 5252.236-9310. Submit As-Built Drawings 30 days prior to Beneficial Occupancy Date(BOD).

3.1.1 Markup Guidelines

Make comments and markup the drawings complete without reference to letters, memos, or materials that are not part of the As-Built drawing. Show what was changed, how it was changed, where items(s) were relocated and change related details. These working as-built markup prints must be neat, legible and accurate as follows:

a. Use base colors of red, green, and blue. Color code for changes as follows:

   (1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

   (2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

   (3) Additions (Green) - Added items, lettering in notes and leaders.

b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.

c. Add and denote any additional equipment or material facilities, service lines, incorporated under As-Built Revisions if not already shown in legend.

d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.

e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.

f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.

g. For deletions, cross out all features, data and captions that relate to that revision.

h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.

i. Indicate one of the following when attaching a print or sketch to a markup print:

   1) Add an entire drawing to contract drawings

   2) Change the contract drawing to show

   3) Provided for reference only to further detail the initial design.

j. Incorporate all shop and fabrication drawings into the markup drawings.

3.1.2 As-Built Drawings Content

Show on the as-built drawings, but not limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building structure.

c. Layout and schematic drawings of electrical circuits and piping.

d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

e. Changes in details of design or additional information obtained from

working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

g. Changes or Revisions which result from the final inspection.

h. Where contract drawings or specifications present options, show only the option selected for construction on the working as-built markup drawings.

i. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.

j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

k. Changes in location of equipment and architectural features.

j. Modifications (include within change order price the cost to change working as-built markup drawings to reflect modifications) and compliance with FC 1-300-09N procedures.

l. Actual location of anchors, construction and control joints, etc., in concrete.

m. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

n. Location, extent, thickness, and size of stone protection particularly where it will be normally submerged by water.

3.2 RECORD DRAWINGS

Prepare and provide Record Drawings in accordance with FC 1-300-09N. Provide 2 copies of Record Drawings on two separate CDs or DVDs 30 days after BOD.

Prepare final record drawings after the completion of each definable phase of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). Transfer the changes from the approved working as-built markup drawings to the original electronic CAD drawing files. Modify the as-built CAD drawing files to correctly show the features of the project as-built by bringing the working CAD drawing set into agreement with approved working as-built markup drawings, and adding such additional drawings as may be necessary. Refer to FC 1-300-09N Chapter 12 ELECTRONIC DESIGN DELIVERABLES (EDD) FORMAT. Jointly review the working as-built markup drawings with printouts from working as-built CAD drawing PDF files for accuracy and completeness. Monthly review of working as-built CAD drawing PDF file printouts must cover all sheets revised since the previous review. The final record drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final record drawings as specified herein, the Contracting Officer will deduct

from the monthly progress payment an amount representing the estimated cost of maintaining the record drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. These PDF drawing files are part of the permanent records of this project. Any drawings damaged or lost must be satisfactorily replaced at no expense to the Government.

a. Drawing revisions (include within change order price the cost to change working and final record drawings to reflect revisions) and compliance with the following procedures.

(1) Follow directions in the revision for posting descriptive changes.

(2) The revision delta size must be 5/16 inch unless the area where the delta is to be placed is crowded. Use a smaller size delta for crowded areas.

(3) Place a revision delta at the location of each deletion.

(4) For new details or sections which are added to a drawing, place a revision delta by the detail or section title.

(5) For minor changes, place a revision delta by the area changed on the drawing (each location).

(6) For major changes to a drawing, place a revision delta by the title of the affected plan, section, or detail at each location.

(7) For changes to schedules or drawings, place a revision delta either by the schedule heading or by the change in the schedule.

3.3 OPERATION AND MAINTENANCE MANUALS

Provide project operation and maintenance manuals as specified in Section 01 78 23 OPERATION AND MAINTENANCE MANUALS DATA. Provide four electronic copies of the Operation and Maintenance Manual files. Submit to the Contracting Officer for approval within 60 calendar days of the Beneficial Occupancy Date (BOD). Update and resubmit files for final approval at BOD.

3.4 CLEANUP

Provide final cleaning in accordance with ASTM E1971 and submit two copies of the listing of completed final clean-up items. Leave premises "broom clean." Comply with GS-37 for general purpose cleaning and bathroom cleaning. Use only nonhazardous cleaning materials, including natural cleaning materials, in the final cleanup. Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean filters of operating equipment and comply with the Indoor Air Quality (IAQ) Management Plan. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site. Recycle, salvage, and return construction and demolition waste from project in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, and 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.

3.5 NAVFAC SUSTAINABLE & ENERGY DATA RECORD CARD

Within 60 days of the completion of Project, complete an electronic copy of the NAVFAC Sustainable & Energy Data Record Card, and submit to the Contracting Officer. Draft Record card for this project should be available from Designer of Record (DOR) or Contracting Officer. Instructions and a blank DD Form (fill-able) in ADOBE (PDF) may be obtained at the Whole Building Design Guide web site by navigating: Home > Participating Agencies > Department of Defense (DoD) > NAVFAC Sustainable Development Program > Contract Documents > NAVFAC Sustainable & Energy Data Record Card; or directly at http://www.wbdg.org/pdfs/navfac_sustainable_energy_data_record_card.pdf.

-- End of Section --

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA
08/15

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.

ASTM INTERNATIONAL (ASTM)

ASTM E1971	(2005; R 2011) Stewardship for the Cleaning of Commercial and Institutional Buildings

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

O&M Database ; G

Training Plan ; G

Training Outline ; G

Training Content ; G

SD-11 Closeout Submittals

Training Video Recording ; G

Validation of Training Completion ; G

1.3 OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data for the provided equipment, product, or system, defining the importance of system interactions, troubleshooting, and long-term preventive operation and maintenance. Compile, prepare, and aggregate O&M data to include clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.3.1 Package Quality

Documents must be fully legible. Operation and Maintenance data must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions.

1.3.2 Package Content

Provide data package content in accordance with paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES. Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission, except as follows. Use Data Package 3, 4 or 5 for commissioned items without a specified data package requirement in the individual technical sections. Provide a Data Package 3, 4 or 5 instead of Data Package 1 or 2, as specified in the individual technical section, for items that are commissioned.

1.3.3 Changes to Submittals

Provide manufacturer-originated changes or revisions to submitted data if a component of an item is so affected subsequent to acceptance of the O&M Data. Submit changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data within 30 calendar days of the notification of this change requirement.

1.4 O&M DATABASE

Develop an editable, electronic spreadsheet based on the equipment in the Operation and Maintenance Manuals that contains the information required to start a preventive maintenance program. As a minimum, provide list of system equipment, location installed, warranty expiration date, manufacturer, model, and serial number.

1.5 OPERATION AND MAINTENANCE MANUAL FILE FORMAT

Assemble data packages into electronic Operation and Maintenance Manuals. Assemble each manual into a composite electronically indexed file using the most current version of Adobe Acrobat or similar software capable of producing PDF file format. Provide compact disks (CD) or data digital versatile disk (DVD) as appropriate, so that each one contains operation, maintenance and record files, project record documents, and training videos. Include a complete electronically linked operation and maintenance directory.

1.5.1 Organization

Bookmark Product and Drawing Information documents using the current version of CSI Masterformat numbering system, and arrange submittals using the specification sections as a structure. Use CSI Masterformat and UFGS numbers along with descriptive bookmarked titles that explain the content of the information that is being bookmarked.

1.5.2 CD or DVD Label and Disk Holder or Case

Provide the following information on the disk label and disk holder or case:

a. Building Number

b. Project Title

c. Activity and Location

d. Construction Contract Number

e. Prepared For: (Contracting Agency)

f. Prepared By: (Name, title, phone number and email address)

g. Include the disk content on the disk label

h. Date

i. Virus scanning program used

1.6 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

The following are a detailed description of the data package items listed in paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES.

1.6.1 Operating Instructions

Provide specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.6.1.1 Safety Precautions and Hazards

List personnel hazards and equipment or product safety precautions for operating conditions. List all residual hazards identified in the Activity Hazard Analysis provided under Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS. Provide recommended safeguards for each identified hazard.

1.6.1.2 Operator Prestart

Provide procedures required to install, set up, and prepare each system for use.

1.6.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.6.1.4 Normal Operations

Provide Control Diagrams with data to explain operation and control of systems and specific equipment. Provide narrative description of Normal Operating Procedures.

1.6.1.5 Emergency Operations

Provide Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Provide Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.6.1.6 Operator Service Requirements

Provide instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gauge readings.

1.6.1.7 Environmental Conditions

Provide a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.6.1.8 Operating Log

Provide forms, sample logs, and instructions for maintaining necessary operating records.

1.6.1.9 Additional Requirements for HVAC Control Systems

Provide Data Package 5 and the following for control systems:

a. Narrative description on how to perform and apply functions, features, modes, and other operations, including unoccupied operation, seasonal changeover, manual operation, and alarms. Include detailed technical manual for programming and customizing control loops and algorithms.

b. Full as-built sequence of operations.

c. Copies of checkout tests and calibrations performed by the Contractor (not Cx tests).

d. Full points list. Provide a listing of rooms with the following information for each room:

(1) Floor

(2) Room number

(3) Room name

(4) Air handler unit ID

(5) Reference drawing number

(6) Air terminal unit tag ID

(7) Heating or cooling valve tag ID

(8) Minimum cfm

(9) Maximum cfm

e. Full print out of all schedules and set points after testing and acceptance of the system.

f. Full as-built print out of software program.

g. Marking of system sensors and thermostats on the as-built floor plan

and mechanical drawings with their control system designations.

1.6.2 Preventive Maintenance

Provide the following information for preventive and scheduled maintenance to minimize repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.6.2.1 Lubrication Data

Include the following preventive maintenance lubrication data, in addition to instructions for lubrication required under paragraph OPERATOR SERVICE REQUIREMENTS:

a. A table showing recommended lubricants for specific temperature ranges and applications.

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.

c. A Lubrication Schedule showing service interval frequency.

1.6.2.2 Preventive Maintenance Plan, Schedule, and Procedures

Provide manufacturer's schedule for routine preventive maintenance, inspections, condition monitoring (predictive tests) and adjustments required to ensure proper and economical operation and to minimize repairs. Provide instructions stating when the systems should be retested. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

a. Define the anticipated time required to perform each of each test (work-hours), test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventive maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize repairs.

b. Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include electrical and mechanical schematics and diagrams and diagnostic techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.6.2.3 Cleaning Recommendations

Provide environmentally preferable cleaning recommendations in accordance with ASTM E1971.

1.6.3 Repair

Provide manufacturer's recommended procedures and instructions for correcting problems and making repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.6.3.1 Troubleshooting Guides and Diagnostic Techniques

Provide step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.6.3.2 Wiring Diagrams and Control Diagrams

Provide point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.6.3.3 Repair Procedures

Provide instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.6.3.4 Removal and Replacement Instructions

Provide step-by-step procedures and a list of required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Use a combination of text and illustrations.

1.6.3.5 Spare Parts and Supply Lists

Provide lists of spare parts and supplies required for repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.6.3.6 Repair Work-Hours

Provide manufacturer's projection of repair work-hours including requirements by type of craft. Identify, and tabulate separately, repair that requires the equipment manufacturer to complete or to participate.

1.6.4 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.6.4.1 Product Submittal Data

Provide a copy of SD-03 Product Data submittals documented with the

required approval.

1.6.4.2 Manufacturer's Instructions

Provide a copy of SD-08 Manufacturer's Instructions submittals documented with the required approval.

1.6.4.3 O&M Submittal Data

Provide a copy of SD-10 Operation and Maintenance Data submittals documented with the required approval.

1.6.4.4 Parts Identification

Provide identification and coverage for the parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing must show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Group the parts shown in the listings by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.

1.6.4.5 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary componentsof the system. Provide copies of warranties required by Section 01 78 00 CLOSEOUT SUBMITTALS.

1.6.4.6 Extended Warranty Information

List all warranties for products, equipment, components, and sub-components whose duration exceeds one year. For each warranty listed, indicate the applicable specification section, duration, start date, end date, and the point of contact for warranty fulfillment. Also, list or reference the specific operation and maintenance procedures that must be performed to keep the warranty valid. Provide copies of warranties required by Section 01 78 00 CLOSEOUT SUBMITTALS.

1.6.4.7 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.6.4.8 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components. Provide final set points.

1.6.4.9 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms. Provide final set points.

1.6.4.10 Field Test Reports

Provide a copy of Field Test Reports (SD-06) submittals documented with the required approval.

1.6.4.11 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.7 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Provide the O&M data packages specified in individual technical sections. The information required in each type of data package follows:

1.7.1 Data Package 1

NOTE: Data Package 1 would typically be used for architectural items requiring simple but specific maintenance and replacement; for example, acoustical ceiling, floor tile or carpeting system.

a. Safety precautions and hazards

b. Cleaning recommendations

c. Maintenance and repair procedures

d. Warranty information

e. Extended warranty information

f. Contractor information

g. Spare parts and supply list

1.7.2 Data Package 2

NOTE: Data Package 2 would be used for an item that is less simple; for example, an item having a motor and some sequence of operation such as a refrigerated drinking fountain.

a. Safety precautions and hazards

b. Normal operations

c. Environmental conditions

d. Lubrication data

e. Preventive maintenance plan, schedule, and procedures

f. Cleaning recommendations

g. Maintenance and repair procedures

h. Removal and replacement instructions

i. Spare parts and supply list

j. Parts identification

k. Warranty information

l. Extended warranty information

m. Contractor information

1.7.3 Data Package 3

NOTE: Data Package 3 would be used for a complex piece of equipment, having a specific troubleshooting sequence, but one which does not require an operator on watch; for example, HVAC temperature controls

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Environmental conditions

g. Operating log

h. Lubrication data

i. Preventive maintenance plan, schedule, and procedures

j. Cleaning recommendations

k. Troubleshooting guides and diagnostic techniques

l. Wiring diagrams and control diagrams

m. Maintenance and repair procedures

n. Removal and replacement instructions

o. Spare parts and supply list

p. Product submittal data

q. O&M submittal data

r. Parts identification

s. Warranty information

t. Extended warranty information

u. Testing equipment and special tool information

v. Testing and performance data

w. Contractor information

x. Field test reports

1.7.4 Data Package 4

NOTE: Data Package 4 would be used for an extremely complex piece of equipment, having an extensive sequence of operation, a complex troubleshooting sequence and one requiring frequent operator attention; at least for start-up and shut-down. Examples of this case would be small boilers and small diesel generator sets.

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Operator service requirements

g. Environmental conditions

h. Operating log

i. Lubrication data

j. Preventive maintenance plan, schedule, and procedures

k. Cleaning recommendations

l. Troubleshooting guides and diagnostic techniques

m. Wiring diagrams and control diagrams

n. Repair procedures

o. Removal and replacement instructions

p. Spare parts and supply list

q. Repair work-hours

r. Product submittal data

s. O&M submittal data

t. Parts identification

u. Warranty information

v. Extended warranty information

w. Personnel training requirements

x. Testing equipment and special tool information

y. Testing and performance data

z. Contractor information

aa. Field test reports

1.7.5 Data Package 5

NOTE: Data Package 5 would be used for electrical equipment, components or systems on which, wiring and control diagrams are needed for operation, maintenance or repair. Examples of this case are 400 Hz frequency converters, annunciator panels and cathodic protection systems

a. Safety precautions and hazards

b. Operator prestart

c. Start-up, shutdown, and post-shutdown procedures

d. Normal operations

e. Environmental conditions

f. Preventive maintenance plan, schedule, and procedures

g. Troubleshooting guides and diagnostic techniques

h. Wiring and control diagrams

i. Maintenance and repair procedures

j. Removal and replacement instructions

k. Spare parts and supply list

l. Product submittal data

m. Manufacturer's instructions

n. O&M submittal data

o. Parts identification

p. Testing equipment and special tool information

q. Warranty information

r. Extended warranty information

s. Testing and performance data

t. Contractor information

u. Field test reports

v. Additional requirements for HVAC control systems

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TRAINING

Prior to acceptance of the facility by the Contracting Officer for Beneficial Occupancy, provide comprehensive training for the systems and equipment specified in the technical specifications. The training must be targeted for the Facilities Management Specialist, building maintenance personnel, and applicable building occupants. Instructors must be well-versed in the particular systems that they are presenting. Address aspects of the Operation and Maintenance Manual submitted in accordance with Section 01 78 00 CLOSEOUT SUBMITTALS and eOMSI Manual, as submitted in Section 01 78 24.00 20 FACILITY ELECTRON0IC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI) if required by the task order. Training must include classroom or field lectures based on the system operating requirements. The location of classroom training requires approval by the Contracting Officer.

3.1.1 Training Plan

Submit a written training plan to the Contracting Officer for approval at least 60 calendar days prior to the scheduled training. Training plan must be approved by the Quality Control Manager (QC) prior to forwarding to the Contracting Officer. Also, coordinate the training schedule with the Contracting Officer and QC. Include within the plan the following elements:

a. Equipment included in training

b. Intended audience

c. Location of training

d. Dates of training

e. Objectives

f. Outline of the information to be presented and subjects covered including description

g. Start and finish times and duration of training on each subject

h. Methods (e.g. classroom lecture, video, site walk-through, actual operational demonstrations, written handouts)

i. Instructor names and instructor qualifications for each subject

j. List of texts and other materials to be furnished by the Contractor that are required to support training

k. Description of proposed software to be used for video recording of training sessions.

3.1.2 Training Content

The core of this training must be based on manufacturer's recommendations and the operation and maintenance information. The QC is responsible for overseeing and approving the content and adequacy of the training. Provide a brief summary of the FACILITY INFORMATION manual, and a more detailed presentation of the PRODUCT AND DRAWING MANUAL, specified in Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI). Spend 95 percent of the instruction time during the presentation on the OPERATION AND MAINTENANCE DATA. Include the following for each system training presentation:

a. Start-up, normal operation, shutdown, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting, and alarms.

b. Relevant health and safety issues.

c. Discussion of how the feature or system is environmentally responsive. Advise adjustments and optimizing methods for energy conservation.

d. Design intent.

e. Use of O&M Manual Files.

f. Review of control drawings and schematics.

g. Interactions with other systems.

h. Special maintenance and replacement sources.

i. Tenant interaction issues.

3.1.3 Training Outline

Provide the Operation and Maintenance Manual Files (Bookmarked PDF), or if required, the eOMSI Manual files as specified in Section 01 78 24.00 20, FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI), and a written course outline listing the major and minor topics to be discussed by the instructor on each day of the course to each trainee in the course. Provide the course outline 14 calendar days prior to the training.

3.1.4 Training Video Recording

Record classroom training session(s) on video. Provide to the Contracting Officer two copies of the training session(s) in DVD video recording format. Capture within the recording, in video and audio, the instructors' training presentations including question and answer periods with the attendees. The recording camera(s) must be attended by a person during the recording sessions to assure proper size of exhibits and projections during the recording are visible and readable when viewed as training.

3.1.5 Unresolved Questions from Attendees

If, at the end of the training course, there are questions from attendees that remain unresolved, the instructor must send the answers, in writing, to the Contracting Officer for transmittal to the attendees, and the training video must be modified to include the appropriate clarifications.

3.1.6 Validation of Training Completion

Ensure that each attendee at each training session signs a class roster daily to confirm Government participation in the training. At the completion of training, submit a signed validation letter that includes a sample record of training for reporting what systems were included in the training, who provided the training, when and where the training was performed, and copies of the signed class rosters. Provide two copies of the validation to the Contracting Officer, and one copy to the Operation and Maintenance Manual Preparer for inclusion into the Manual's documentation.

3.1.7 Quality Control Coordination

Coordinate this training with the QC in accordance with Section 01 45 00.00 20 QUALITY CONTROL.

-- End of Section --

SECTION 01 78 24.00 20

FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI)
02/15

PART 1 GENERAL

NOTE: This eOMSI requirement is for the following type of projects:
1. New construction, Milcon, greater than of equal to $750K.
2. Major renovation projects greater than or equal to 50% of the Plant Replacement Value and greater than or equal to $2.5M.

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.

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014) Navy and Marine Corps Design Procedures

1.2 DEFINITIONS AND ABBREVIATIONS

1.2.1 eOMSI Manual

Manual (PDF file) provided by the Contractor that includes, but is not limited to, product information, a facility description with photos, and a list of primary facility systems.

1.2.2 eOMSI Facility Data Workbook (FDW)

A Microsoft Excel file containing required facility information populated by the Contractor.

1.2.3 Systems

The words "system", "systems", and "equipment", when used in this document refer to as-built systems and equipment.

1.2.4 Computer Assisted Design and Drafting (CADD)

Electronic Computer Assisted Design and Drafting graphic software program that is used to create facility design contract documents and Record Drawings.

1.2.5 KTR

An abbreviation for "Contractor."

1.3 EOMSI MEETINGS

1.3.1 Post-Award Kickoff Meeting

Be prepared to discuss the following during this meeting:

a. eOMSI Manual and eOMSI Facility Data Workbook Development Meetings

b. Processes and methods of gathering eOMSI Manual and eOMSI Facility Data Workbook information during construction.

c. The eOMSI Submittals schedule. Include the eOMSI submittal schedule on the Baseline Construction Schedule in accordance with Section 01 32 17.00 20 COST-LOADED NETWORK ANALYSIS SCHEDULE (NAS).

d. Electronic eOMSI Facility Data Workbook file for Contractor's use and completion.

1.3.2 eOMSI Manual and Facility Data Workbook Coordination Meeting

Facilitate a meeting after the Pre-Construction Meeting prior to the submission of the eOMSI Progress Submittal. Meeting attendance must include the Contractor's eOMSI Manual and Facility Data Workbook Preparer, Designer of Record (DOR), and Quality Control Manager, the Commissioning Authority (CxA), and the Government's Design Manager (DM), Contracting Officer's Representative, and NAVFAC Public Works (PW) Facilities Management Division (FMD). Include any Mechanical, Electrical, and Fire Protection Sub-Contractors.

The purpose of this meeting is to reach a mutual understanding of the scope of work concerning the contract requirements for eOMSI and coordinate the efforts necessary by both the Government and Contractor to ensure an accurate collection, preparation and timely Government review of eOMSI.

1.3.3 Facility Turnover Meeting

Include eOMSI in NAVFAC Red Zone (NRZ) facility turnover meetings as specified in Section 01 30 00, ADMINISTRATIVE REQUIREMENTS.

1.4 SUBMITTAL SCHEDULING

1.4.1 eOMSI, Progress Submittal

Submit the Progress submittal when construction is approximately 50 percent complete, to the Contracting Officer for approval. Provide eOMSI Manual Files (Bookmarked PDF) and eOMSI Facility Data Workbook (Excel). Include the elements and portions of system construction completed up to this point.

The purpose of this submittal is to verify progress is in accordance with contract requirements as discussed during the eOMSI Coordination Meeting. Field verify a portion of the eOMSI information in accordance with paragraph FIELD VERIFICATION.

1.4.2 eOMSI, Prefinal Submittal

Submit the 100 percent submittal of the eOMSI Prefinal Submittal to the Contracting Officer for approval within 60 calendar days of the Beneficial Occupancy Date (BOD). This submittal must provide a complete, working document that can be used to operate and maintain the facility. Any portion of the submittal that is incomplete or inaccurate requires the entire submittal to be returned for correction. Any discrepancies discovered during the Government's review of eOMSI Progress submittal must be corrected prior to the Prefinal submission.

The eOMSI Prefinal Submittal must include eOMSI Manual Files (Bookmarked PDF) and eOMSI Facility Data Workbook (Excel).

1.4.3 eOMSI, Final Submittal

Submit completed eOMSI Manual Files (Bookmarked PDF) and eOMSI Facility Data Workbook (Excel). The Final submittal is due at BOD. Any discrepancies discovered during the Government's review of the Prefinal eOMSI submittal, including the Field Verification, must be corrected prior to the Final eOMSI submission.

1.5 UNITS OF MEASURE

Provide eOMSI utilizing the units of measure required by the RFP for the facility. Refer to Section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

eOMSI, Progress Submittal; G

eOMSI, Prefinal Submittal; G

eOMSI, Final Submittal; G

PART 2 PRODUCTS

2.1 eOMSI FILES FORMAT

Format eOMSI manuals and files in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA. Include a complete electronically linked operation and maintenance directory. Provide four electronic copies of the eOMSI Manuals to the Contracting Officer for approval.

Provide eOMSI Facility Data Workbook on compact disks (CD) or data digital versatile disk (DVD) disks in (EXCEL) format. Scan eOMSI Manual Files and eOMSI Facility Data Workbook for viruses, malware, and spyware using a commercially available scanning program that is routinely updated to identify and remove current virus threats.

2.1.1 eOMSI Manual Organization

Organize the eOMSI Manuals into two parts: 1) Product and Drawing Information, and 2) Facility Information. Bookmark the PDF files for easy access to the information.

a. Bookmark Product and Drawing Information documents in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

b. Bookmark Facility Information to at least one level lower than the major system.

2.1.2 eOMSI Manual CD or DVD Disk Label and Disk Holder or Case

Provide disks in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

2.2 eOMSI MANUAL

2.2.1 Product and Drawing Information

Provide an organized record of the facility products, materials, equipment, and minimum information necessary to operate the facility. Provide Product and Drawing Information for the systems in the final constructed facility.

2.2.1.1 O&M Data

As a minimum, provide the approved O&M Data, submitted in the technical specification sections, in accordance with paragraph TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES in Section 01 78 23 OPERATION AND MAINTENANCE DATA.

2.2.1.2 Record Drawings

Provide an electronic, PDF copy of the Record Drawings, prepared in accordance with FC 1-300-09N and 01 78 00 CLOSEOUT SUBMITTALS. Bookmark drawings using the sheet title and sheet number.

Include Record Drawings as part of the Red-Zone specified in Section 01 30 00 ADMINISTRATIVE REQUIREMENTS.

2.2.1.3 Utility Record Drawings

Using Record Source Drawings, show and document details of the actual installation of the utility systems; annotate and highlight the eOMSI information. Provide Utility Record Drawings in PDF format. Provide the following drawings at a large enough scale to differentiate designated isolation units from surrounding valves and switches.

a. Utility Schematic Diagrams - Provide a one line schematic diagram for each utility system such as power, water, wastewater, and gas/fuel. Schematic diagram must show from the point where the utility line is connected to the mainline up to the five-foot connection point to the facility. Indicate location or area designation for route of transmission or distribution lines; locations of duct banks, manholes/ handholes or poles; isolation units such as valves and switches; and utility facilities such as pump stations, lift stations, and substations.

b. Enlarged Connection and Cutoff Plans - Provide enlarged floor plans that provide information between the five foot utility connection point and where utilities connect to facility distribution. Enlarge floor plans/ elevations of the rooms where the utility enters the building and indicate on these plans locations of the main interior and exterior connection and cutoff points for the utilities. Also enlarge floor plans / elevations of the rooms where equipment is located. Include enough information to enable someone unfamiliar with the facility to locate the connection and cutoff points. Indicate designations such as room number, panel number, circuit breaker, or valve number, of each utility and equipment connection and cutoff point, and what that

connection and cutoff point controls.

2.2.2 Facility Information

Provide the following in Facility Information:

2.2.2.1 General Facility and System Description

Describe the function of the facility. Detail the overall dimensions of the facility, number of floors, foundation type, expected number of occupants, and facility Category Code. List and generally describe all the facility systems and any special building features (for example, HVAC Controls, Sprinkler Systems, Cranes, Elevators, and Generators). Include photographs marked up and labeled to show key operating components and the overall facility appearance.

2.2.2.2 Basis of Design

Include the Basis of Design that shows the basic design scope of work, assumptions and the original intentions of the Designer of Record (DOR). Identify the site utility design goals, objectives, design load limits, assumptions, and system features that are critical to the operation and maintenance of the systems.

2.2.2.3 Floor Plans

Provide uncluttered, legible 11 by 17 inches floor plans. Include room numbers, type or function of spaces, and overall facility dimensions on the floor plans. Do not include items such as construction instructions, references, or frame numbers.

2.2.2.4 Floor Coverings, Wall Surfaces, and Ceiling Surfaces

Provide a table that lists by room number (including hallways and common spaces), the type, and area of finish, manufacturer's product name, identifying number, and color. Include a facility summary of the total area for each type of space and floor, wall, or ceiling finish in the table.

2.2.2.5 Windows

Provide a table that lists by room number (including hallways and common spaces), the type of window, window size, number of each size and type, special features, manufacturer's product name, identifying number, and color. The table must include a facility summary of the total number for each type and size of window.

2.2.2.6 Roofing

Provide the total area of each type of roof surface and system. Provide the name of the roofing product and system; manufacturer's, supplier's, and installer's names, addresses, and phone numbers; manufacturer's product name, identifying number, and color. For each type of roof, provide a recommended inspection, maintenance and repair schedule that details checkpoints, frequencies, and prohibited practices. List roof structural load limits.

2.2.2.7 HVAC Filters

Provide a table that lists the quantity, type, size, and location of each

HVAC filter, manufacturer's product name, and identifying number.

2.2.2.8 Plumbing Fixtures

Provide a table that lists by room number, the number and type of plumbing and bathroom plumbing fixtures (for example, sinks, water closets, urinals, showers and drinking fountains).

2.2.2.9 Lighting Fixtures

Provide a table that lists by room number (including hallways and common spaces), the type of lighting fixture, ballast, number of lighting fixtures, type of lamps and number of lamps, and the manufacturer's product name and the identifying number. The table must include a facility summary of the total number of fixtures of each type and number of lamps of each type.

2.2.2.10 Equipment Listing

Provide a table that lists the major equipment shown on the design equipment schedules. Show the item descriptions, locations, model numbers; and the names, addresses, and telephone numbers of the manufacturers, suppliers, contractors, and subcontractors.

2.2.2.11 System Flow Diagrams

Provide a flow diagram indicating system liquid, air or gas flow during normal operations. Integrate the system components into the diagram. A compilation of non-integrated, flow diagrams for the individual system components are not acceptable.

2.2.2.12 Valve List

Provide a list of all valves associated with the system. Show valve type, identification number, function, location and normal operating position.

2.2.2.13 Riser Diagrams

Provide riser diagrams and settings of equipment.

2.3 eOMSI FACILITY DATA WORKBOOK

Download the eOMSI Facility Data Workbook at the following location: http://www.wbdg.org/ccb/NAVGRAPH/graphtoc.pdf. Complete the KTR Facility Data File tab based on the selection of Mastersystems, Systems, and Subsystems installed. The following tabs are included in the eOMSI Facility Data File Workbook and serve the purpose stated:

a. Instructions Tab: Instructions for completing Model & Facility Data Matrix Tab and KTR Facility Data File Tab. If a discrepancy exists between what is required in this section and the Workbook, the instructions within the workbook take precedence.

b. Model & Facility Data Matrix Tab: - The Matrix lists Required Facility Asset Fields for each SYSTEM and SUBSYSTEM. The Designer of Record selects SYSTEMS and SUBSYSTEMS that are within the project scope, which the Contractor needs to include and populate in KTR Facility Data File tab. The "Required Facility Asset Field Position Numbers," one through seventeen, are pre-populated, and are not editable.

c. Required Facility Asset Fields Tab: Defines the 17 Required Facility Asset Field Position Numbers used in Model and Facility Data Matrix and KTR Facility Data File tabs.

d. KTR Sample Facility Data File Tab: Sample KTR eOMSI facility data file. This tab provides an example of the mandatory fields of equipment installed by the Contractor, and populated in the KTR eOMSI Facility Data File Tab, along with their descriptions.

e. KTR Facility Data File Tab: Required eOMSI facility data file deliverable provided to the Government. Provide a separate and unique new row for each facility component or piece of equipment installed.

PART 3 EXECUTION

3.1 FIELD VERIFICATION

Field verify eOMSI Facility Data Workbook information with Contractor and Government personnel. Include the following personnel in this meeting: Contractor's eOMSI Manual and Facility Data Workbook Preparer and Quality Control Manager, Commissioning Authority, and the Government's Contracting Officer's Representative and NAVFAC PW FMD. Request, and provide, an eOMSI Field Verification Meeting no sooner than 14 calendar days after submission of the Progress eOMSI submittal, and another, no sooner than 14 calendar days after submission of the Prefinal eOMSI submittal. During this meeting, the Government and Contractor will verify that the eOMSI Facility Data Workbook is complete and accurate.

Field verify that at least 5 Subsystems under each of the Mastersystems are accurate, for a total of 25 Subsystems. For each of these items, verify that the required facility asset field, as defined in the "Model & Facility Data Matrix" tab, contains the specified data and it is accurate (i.e. item description, manufacturer, model no., serial no.). 100 percent accuracy of eOMSI information is required for successful field verification. If data discrepancies are discovered amongst the 25 Subsystems verified, resubmit an updated eOMSI FDW, and request a make-up field verification meeting. At the make-up field verification meeting 25 new Subsystems and their associated required facility asset fields will be field verified; the 25 new Subsystems must be 100% accurate. Any discrepancies discovered must be corrected prior to next eOMSI Facility Data Workbook Submittal.

(1) D10 - CONVEYING
(2) D20 - PLUMBING
(3) D30 - HVAC
(4) D40 - FIRE PROTECTION
(5) D50 - ELECTRICAL

3.2 eOMSI TRAINING

Provide training on eOMSI Manuals and Facility Data Workbook in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

-- End of Section --

SECTION 02 41 00

DEMOLITION AND DECONSTRUCTION
05/10

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.

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)

AHRI Guideline K	(2009) Guideline for Containers for Recovered Non-Flammable Fluorocarbon Refrigerants

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 145	(1991; R 2008) Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
AASHTO T 180	(2010) Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6	(2006) Safety Requirements for Demolition Operations

CARPET AND RUG INSTITUTE (CRI)

CRI CIS	(2011) Carpet Installation Standard

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008; Errata 1-2010; Changes 1-3 2010; Changes 4-6 2011; Change 7 2012) Safety and Health Requirements Manual

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25	(June 2000) Storage and Handling of Liquefied and Gaseous Compressed Gases and Their Full and Empty Cylinders

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M	(2006) MILSTRIP - Military Standard Requisitioning and Issue Procedures

MIL-STD-129	(2014; Rev R) Military Marking for Shipment and Storage

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

40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 82	Protection of Stratospheric Ozone
49 CFR 173.301	Shipment of Compressed Gases in Cylinders and Spherical Pressure Vessels

1.2 PROJECT DESCRIPTION

1.2.1 Demolition/Deconstruction Plan

Prepare a either a Demolition Plan or Deconstruction Plan and submit proposed salvage, demolition, deconstruction, and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Identify components and materials to be salvaged for reuse or recycling with reference to paragraph Existing Facilities to be Removed. Append tracking forms for all removed materials indicating type, quantities, condition, destination, and end use. Coordinate with Waste Management Plan. Include statements affirming Contractor inspection of the existing roof deck and its suitability to perform as a safe working platform or if inspection reveals a safety hazard to workers, state provisions for securing the safety of the workers throughout the performance of the work. Provide procedures for safe conduct of the work in accordance with EM 385-1-1. Plan shall be approved by Structural PE prior to work beginning.

1.2.2 General Requirements

Do not begin demolition or deconstruction until authorization is received from the Contracting Officer. The work of this section is to be performed in a manner that maximizes the value derived from the salvage and recycling of materials. The work includes demolition, deconstruction, salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 ITEMS TO REMAIN IN PLACE

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Contracting Officer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload structural elements . Provide new supports and reinforcement for

existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Contracting Officer prior to performing such work.

1.3.1 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

1.3.2 Weather Protection

For portions of the building to remain, protect building interior and materials and equipment from the weather at all times. Where removal of existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas.

1.3.3 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.3.4 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Government and disconnected and sealed by the Contractor .

1.3.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished or deconstructed, unless directed otherwise by the Contracting Officer. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

1.4 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted . Where burning is permitted, adhere to federal, state, and local regulations.

1.5 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be available in accordance with the following schedule:

Schedule	
Area	Date

1.6 SUBMITTALS

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

SD-01 Preconstruction Submittals

Existing Conditions; G

SD-07 Certificates

Demolition Plan; G
Deconstruction Plan; G
Notification; G
Notification of Demolition and Renovation form; G

SD-11 Closeout Submittals

Receipts

1.7 QUALITY ASSURANCE

Submit timely notification of demolition deconstruction and renovation projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the Regional Office of the United States Environmental Protection Agency (USEPA) State's environmental protection agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSE/SAFE A10.6. Comply with the Environmental Protection Agency requirements specified. Use of explosives will not be permitted.

1.7.1 Hawaii Requirements

Complete and submit Notification of Demolition and Renovation form to Federal and State authorities and Contracting Officer, postmarked or delivered at least ten working days prior to commencement of work, in accordance with 40 CFR 61, Subpart M. Complete paragraphs I, II, III.B, III.C (if applicable), IX, and XVI of form. Copy of form is attached at end of this section.

1.7.2 Dust and Debris Control

Prevent the spread of dust and debris to occupied portions of the building

and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to aircraft.

1.8 PROTECTION

1.8.1 Traffic Control Signs

a. Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning such work.

1.8.2 Protection of Personnel

Before, during and after the demolition and deconstruction work continuously evaluate the condition of the structure being demolished and deconstructed and take immediate action to protect all personnel working in and around the project site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.9 FOREIGN OBJECT DAMAGE (FOD)

Aircraft and aircraft engines are subject to FOD from debris and waste material lying on airfield pavements. Remove all such materials that may appear on operational aircraft pavements due to the Contractor's operations. If necessary, the Contracting Officer may require the Contractor to install a temporary barricade at the Contractor's expense to control the spread of FOD potential debris. The barricade shall include a fence covered with a fabric designed to stop the spread of debris. Anchor the fence and fabric to prevent displacement by winds or jet/prop blasts. Remove barricade when no longer required.

1.10 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Contracting Officer.

1.11 EXISTING CONDITIONS

Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results.

PART 2 PRODUCTS

2.1 FILL MATERIAL

a. Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill basements, voids, depressions or excavations resulting from demolition or deconstruction of structures. Fill material shall be waste products from demolition or deconstruction until all waste appropriate for this purpose is consumed.

b. Fill material shall conform to the definition of satisfactory soil material as defined in AASHTO M 145, Soil Classification Groups A-1, A-2-4, A-2-5 and A-3. In addition, fill material shall be free from roots and other organic matter, trash, debris, frozen materials, and stones larger than 2 inches in any dimension.

c. Proposed fill material must be sampled and tested by an approved soil testing laboratory, as follows:

Soil classification	AASHTO M 145
Moisture-density relations	AASHTO T 180, Method B or D

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse onsite whenever possible.

3.1.1 Structures

a. Remove existing structures indicated to be removed to grade . Interior walls, other than retaining walls and partitions, shall be removed to 2 feet below grade or to top of concrete slab on ground. Break up basement slabs to permit drainage. Remove sidewalks, curbs, gutters and street light bases as indicated.

b. Demolish or Deconstruct structures in a systematic manner from the top of the structure to the ground. Complete demolition work above each tier or floor before the supporting members on the lower level are disturbed. Demolish concrete and masonry walls in small sections. Remove structural framing members and lower to ground by means of derricks, platforms hoists, or other suitable methods as approved by the Contracting Officer.

c. Locate demolition and deconstruction equipment throughout the structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing.

d. Building, or the remaining portions thereof, not exceeding 80 feet in height may be demolished by the mechanical method of demolition.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contracting Officer. Do not interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition or deconstruction work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered but are not indicated on the drawings, notify the Contracting Officer prior to further work in that area. Remove meters and related equipment and deliver to a location on the station in accordance with instructions of the Contracting Officer.

3.1.3 Chain Link Fencing

Remove chain link fencing, gates and other related salvaged items scheduled for removal and transport to designated areas. Remove gates as whole units. Cut chain link fabric to 25 foot lengths and store in rolls off the ground.

3.1.4 Paving and Slabs

Remove ground concrete and asphaltic concrete paving and slabs including aggregate base to a depth of 12 inches below existing adjacent grade. Provide neat sawcuts at limits of pavement removal as indicated. Pavement and slabs designated to be recycled and utilized in this project shall be moved, ground and stored as directed by the Contracting Officer. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.1.5 Roofing

Remove existing roof system and associated components in their entirety down to existing roof deck. Sequence work to minimize building exposure between demolition or deconstruction and new roof materials installation.

3.1.5.1 Temporary Roofing

Install temporary roofing and flashing as necessary to maintain a watertight condition throughout the course of the work. Remove temporary work prior to installation of permanent roof system materials unless approved otherwise by the Contracting Officer.

3.1.5.2 Reroofing

When removing the existing roofing system from the roof deck, remove only as much roofing as can be recovered by the end of the work day, unless approved otherwise by the Contracting Officer. Do not attempt to open the roof covering system in threatening weather. Reseal all openings prior to suspension of work the same day.

3.1.6 Masonry

Sawcut and remove masonry so as to prevent damage to surfaces to remain and to facilitate the installation of new work. Where new masonry adjoins existing, the new work shall abut or tie into the existing construction as specified for the new work. Provide square, straight edges and corners where existing masonry adjoins new work and other locations. .

3.1.7 Concrete

Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

3.1.8 Structural Steel

Dismantle structural steel at field connections and in a manner that will prevent bending or damage. Salvage for recycle structural steel, steel joists, girders, angles, plates, columns and shapes. Flame-cutting torches are permitted when other methods of dismantling are not practical. Transport steel joists and girders as whole units and not dismantled. Transport structural steel shapes to a designated area as directed by the Contracting Officer, stacked according to size, type of member and length, and stored off the ground, protected from the weather.

3.1.9 Miscellaneous Metal

Salvage shop-fabricated items such as access doors and frames, steel gratings, metal ladders, wire mesh partitions, metal railings, metal windows and similar items as whole units. Salvage light-gage and cold-formed metal framing, such as steel studs, steel trusses, metal gutters, roofing and siding, metal toilet partitions, toilet accessories and similar items. Scrap metal shall become the Contractor's property. Recycle scrap metal as part of demolition and deconstruction operations. Provide separate containers to collect scrap metal and transport to a scrap metal collection or recycling facility, in accordance with the Waste Management Plan.

3.1.10 Carpentry

Salvage for recycle lumber, millwork items, and finished boards, and sort by type and size. windows, doors, frames, and cabinets, and similar items as whole units, complete with trim and accessories. Brace the open end of door frames to prevent damage.

3.1.11 Carpet

Remove existing carpet for reclamation in accordance with manufacturer recommendations and as follows. Remove used carpet in large pieces, roll tightly, and pack neatly in a container. Remove adhesive according to recommendations of the Carpet and Rug Institute (CRI). Adhesive removal solvents shall comply with CRI CIS. Recycle removed carpet cushion.

3.1.12 Acoustic Ceiling Tile

Remove, neatly stack, and recycle acoustic ceiling tiles. Recycling may be available with manufacturer. Otherwise, priority shall be given to a local recycling organization. Recycling is not required if the tiles contain or may have been exposed to asbestos material.

3.1.13 Patching

Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces, using on-site materials when available. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

a. Concrete and Masonry: Completely fill holes and depressions, caused by previous physical damage or left as a result of removals in existing masonry walls to remain, with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

b. Where existing partitions have been removed leaving damaged or missing resilient tile flooring, patch to match the existing floor tile.

c. Patch acoustic lay-in ceiling where partitions have been removed. The transition between the different ceiling heights shall be effected by continuing the higher ceiling level over to the first runner on the lower ceiling and closing the vertical opening with a painted sheet metal strip.

3.1.14 Air Conditioning Equipment

Remove air conditioning, refrigeration, and other equipment containing refrigerants without releasing chlorofluorocarbon refrigerants to the atmosphere in accordance with the Clean Air Act Amendment of 1990. Recover all refrigerants prior to removing air conditioning, refrigeration, and other equipment containing refrigerants and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.15 Cylinders and Canisters

Remove all fire suppression system cylinders and canisters and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.16 Locksets on Swinging Doors

Remove all locksets from all swinging doors indicated to be removed and disposed of. Deliver the locksets and related items to a designated location for receipt by the Contracting Officer after removal.

3.1.17 Mechanical Equipment and Fixtures

Disconnect mechanical hardware at the nearest connection to existing services to remain, unless otherwise noted. Disconnect mechanical equipment and fixtures at fittings. Remove service valves attached to the

unit. Salvage each item of equipment and fixtures as a whole unit; listed, indexed, tagged, and stored. Salvage each unit with its normal operating auxiliary equipment. Transport salvaged equipment and fixtures, including motors and machines, to a designated on station storage area as directed by the Contracting Officer. Do not remove equipment until approved. Do not offer low-efficiency equipment for reuse.

3.1.17.1 Preparation for Storage

Remove water, dirt, dust, and foreign matter from units; tanks, piping and fixtures shall be drained; interiors, if previously used to store flammable, explosive, or other dangerous liquids, shall be steam cleaned. Seal openings with caps, plates, or plugs. Secure motors attached by flexible connections to the unit. Change lubricating systems with the proper oil or grease.

3.1.17.2 Piping

Disconnect piping at unions, flanges and valves, and fittings as required to reduce the pipe into straight lengths for practical storage. Store salvaged piping according to size and type. If the piping that remains can become pressurized due to upstream valve failure, end caps, blind flanges, or other types of plugs or fittings with a pressure gage and bleed valve shall be attached to the open end of the pipe to ensure positive leak control. Carefully dismantle piping that previously contained gas, gasoline, oil, or other dangerous fluids, with precautions taken to prevent injury to persons and property. Store piping outdoors until all fumes and residues are removed. Box prefabricated supports, hangers, plates, valves, and specialty items according to size and type. Wrap sprinkler heads individually in plastic bags before boxing. Classify piping not designated for salvage, or not reusable, as scrap metal.

3.1.17.3 Ducts

Classify removed duct work as scrap metal.

3.1.17.4 Fixtures, Motors and Machines

Remove and salvage fixtures, motors and machines associated with plumbing, heating, air conditioning, refrigeration, and other mechanical system installations. Salvage, box and store auxiliary units and accessories with the main motor and machines. Tag salvaged items for identification, storage, and protection from damage. Classify broken, damaged, or otherwise unserviceable units and not caused to be broken, damaged, or otherwise unserviceable as debris to be disposed of by the Contractor.

3.1.18 Electrical Equipment and Fixtures

Salvage motors, motor controllers, and operating and control equipment that are attached to the driven equipment. Salvage wiring systems and components. Box loose items and tag for identification. Disconnect primary, secondary, control, communication, and signal circuits at the point of attachment to their distribution system.

3.1.18.1 Fixtures

Remove and salvage electrical fixtures. Salvage unprotected glassware from the fixture and salvage separately. Salvage incandescent, mercury-vapor, and fluorescent lamps and fluorescent ballasts manufactured prior to 1978,

boxed and tagged for identification, and protected from breakage.

3.1.18.2 Electrical Devices

Remove and salvage switches, switchgear, transformers, conductors including wire and nonmetallic sheathed and flexible armored cable, regulators, meters, instruments, plates, circuit breakers, panelboards, outlet boxes, and similar items. Box and tag these items for identification according to type and size.

3.1.18.3 Wiring Ducts or Troughs

Remove and salvage wiring ducts or troughs. Dismantle plug-in ducts and wiring troughs into unit lengths. Remove plug-in or disconnecting devices from the busway and store separately.

3.1.18.4 Conduit and Miscellaneous Items

Salvage conduit except where embedded in concrete or masonry. Consider corroded, bent, or damaged conduit as scrap metal. Sort straight and undamaged lengths of conduit according to size and type. Classify supports, knobs, tubes, cleats, and straps as debris to be removed and disposed.

3.1.19 Elevators and Hoists

Remove elevators, hoists, and similar conveying equipment and salvage as whole units, to the most practical extent. Remove and prepare items for salvage without damage to any of the various parts. Salvage and store rails for structural steel with the equipment as an integral part of the unit.

3.1.20 Items With Unique/Regulated Disposal Requirements

Remove and dispose of items with unique or regulated disposal requirements in the manner dictated by law or in the most environmentally responsible manner.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition or deconstruction work in areas occupied by structures to be demolished or deconstructed until all demolition and deconstruction in the area has been completed and debris removed. Fill holes, open basements and other hazardous openings.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition, deconstruction, and removal procedures, and authorization by the Contracting Officer to begin demolition and deconstruction. The Government will not be responsible for

the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.2 Reuse of Materials and Equipment

Remove and store materials and equipment listed in the Demolition or Deconstruction Plan to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.3.3 Salvaged Materials and Equipment

Remove materials and equipment that are listed in the Demolition or Deconstruction Plan to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site .

a. Salvage items and material to the maximum extent possible.

b. Store all materials salvaged for the Contractor as approved by the Contracting Officer and remove from Government property before completion of the contract. On site sales of salvaged material is prohibited.

c. Remove salvaged items to remain the property of the Government in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers. Deliver the following items reserved as property of the Government to the areas designated: .

d. Remove the following items reserved as property of the using service prior to commencement of work under this contract: .

e. Remove historical items in a manner to prevent damage. Deliver the following historical items to the Government for disposition: Corner stones, contents of corner stones, and document boxes wherever located on the site.

f. Remove and capture all Class I ODS refrigerants in accordance with the Clean Air Act Amendment of 1990, and turn in to the Navy as directed by the Commanding Officer.

3.3.4 Disposal of Ozone Depleting Substance (ODS)

Class I and Class II ODS are defined in Section, 602(a) and (b), of The Clean Air Act. Prevent discharge of Class I and Class II ODS to the atmosphere. Place recovered ODS in cylinders meeting AHRI Guideline K suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. Recovered ODS shall be . Products, equipment and appliances containing ODS in a sealed, self-contained system (e.g. residential refrigerators and window air conditioners) shall be disposed of in accordance with 40 CFR 82. Submit Receipts or bills of lading, as specified. Submit a shipping receipt or bill of lading for all containers of ozone depleting substance (ODS) shipped to the Defense Depot, Richmond, Virginia.

3.3.4.1 Special Instructions

No more than one type of ODS is permitted in each container. A warning/hazardous label shall be applied to the containers in accordance with Department of Transportation regulations. All cylinders including but not limited to fire extinguishers, spheres, or canisters containing an ODS shall have a tag with the following information:

a. Activity name and unit identification code

b. Activity point of contact and phone number

c. Type of ODS and pounds of ODS contained

d. Date of shipment

e. National stock number (for information, call (804) 279-4525).

3.3.4.2 Fire Suppression Containers

Deactivate fire suppression system cylinders and canisters with electrical charges or initiators prior to shipment. Also, safety caps must be used to cover exposed actuation mechanisms and discharge ports on these special cylinders.

3.3.5 Transportation Guidance

Ship all ODS containers in accordance with MIL-STD-129, DLA 4145.25 (also referenced one of the following: Army Regulation 700-68, Naval Supply Instruction 4440.128C, Marine Corps Order 10330.2C, and Air Force Regulation 67-12), 49 CFR 173.301, and DOD 4000.25-1-M.

3.3.6 Unsalvageable and Non-Recyclable Material

Dispose of unsalvageable and non-recyclable noncombustible material in the disposal area located . The fill in the disposal area shall remain below elevation and after disposal is completed, the disposal area shall be uniformly graded to drain. Dispose of unsalvageable and non-recyclable combustible material in the sanitary fill area located off the site .

3.4 CLEANUP

Remove debris and rubbish from basement and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified in the Waste Management Plan .

3.5.2 Burning on Government Property

Burning of materials removed from demolished and deconstructed structures will not be permitted on Government property .

3.5.3 Removal to Spoil Areas on Government Property

Transport noncombustible materials removed from demolition and deconstruction structures to designated spoil areas on Government property.

3.5.4 Removal from Government Property

Transport waste materials removed from demolished and deconstructed structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

3.6 REUSE OF SALVAGED ITEMS

Recondition salvaged materials and equipment designated for reuse before installation. Replace items damaged during removal and salvage operations or restore them as necessary to usable condition.

-- End of Section --

SECTION 02 82 16.00 20

ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS
08/11

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE Z9.2	(2012) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

ASTM INTERNATIONAL (ASTM)

ASTM C732	(2006; R 2012) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D2794	(1993; R 2010) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D522/D522M	(2014) Mandrel Bend Test of Attached Organic Coatings
ASTM E119	(2012a) Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM E1368	(2014) Visual Inspection of Asbestos Abatement Projects
ASTM E1494	(2012) Encapsulants for Spray- or Trowel-Applied Friable Asbestos-Containing Building Materials
ASTM E736	(2000; R 2011) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E84	(2013a) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E96/E96M	(2013) Standard Test Methods for Water Vapor Transmission of Materials

STATE OF VIRGINIA ADMINISTRATIVE CODE (VAC)

16 VAC 25-20-30	Title 16, Agency 25, Chapter 20, Section 30: Notification and Permit Fee

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 560/5-85-024	(1985) Guidance for Controlling Asbestos-Containing Materials in Buildings (Purple Book)

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

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.1101	Asbestos
29 CFR 1926.200	Accident Prevention Signs and Tags
29 CFR 1926.51	Sanitation
29 CFR 1926.59	Hazard Communication
40 CFR 61-SUBPART A	General Provisions
40 CFR 61-SUBPART M	National Emission Standard for Asbestos
40 CFR 763	Asbestos

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

ND OPNAVINST 5100.23	(2005; Rev G) Navy Occupational Safety and Health (NAVOSH) Program Manual

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 ACM

Asbestos Containing Materials.

1.2.2 Amended Water

Water containing a wetting agent or surfactant with a maximum surface tension of 0.00042 psi.

1.2.3 Area Sampling

Sampling of asbestos fiber concentrations which approximates the concentrations of asbestos in the theoretical breathing zone but is not actually collected in the breathing zone of an employee.

1.2.4 Asbestos

The term asbestos includes chrysotile, amosite, crocidolite, tremolite

asbestos, anthophyllite asbestos, and actinolite asbestos and any of these minerals that has been chemically treated or altered. Materials are considered to contain asbestos if the asbestos content of the material is determined to be at least one percent.

1.2.5 Asbestos Control Area

That area where asbestos removal operations are performed which is isolated by physical boundaries which assist in the prevention of the uncontrolled release of asbestos dust, fibers, or debris.

1.2.6 Asbestos Fibers

Those fibers having an aspect ratio of at least 3:1 and longer than 5 micrometers as determined by National Institute for Occupational Safety and Health (NIOSH) Method 7400.

1.2.7 Asbestos Permissible Exposure Limit

0.1 fibers per cubic centimeter of air as an 8-hour time weighted average measured in the breathing zone as defined by 29 CFR 1926.1101 or other Federal legislation having legal jurisdiction for the protection of workers health.

1.2.8 Background

The ambient airborne asbestos concentration in an uncontaminated area as measured prior to any asbestos hazard abatement efforts. Background concentrations for other (contaminated) areas are measured in similar but asbestos free locations.

1.2.9 Contractor

The Contractor is that individual, or entity under contract to the Navy to perform the herein listed work.

1.2.10 Competent Person

A person meeting the requirements for competent person as specified in 29 CFR 1926.1101 including a person capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, and is specifically trained in a training course which meet the criteria of EPA's Model Accreditation Plan (40 CFR 763) for project designer or supervisor, or its equivalent. The competent person shall have a current State of Hawaii asbestos contractors or supervisors license.

1.2.11 Encapsulation

The abatement of an asbestos hazard through the appropriate use of chemical encapsulants.

1.2.12 Encapsulants

Specific materials in various forms used to chemically or physically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There are four types of encapsulants as follows which must comply with performance requirements as specified herein.

a. Removal Encapsulant (can be used as a wetting agent)

b. Bridging Encapsulant (used to provide a tough, durable surface coating to asbestos containing material)

c. Penetrating Encapsulant (used to penetrate the asbestos containing material encapsulating all asbestos fibers and preventing fiber release due to routine mechanical damage)

d. Lock-Down Encapsulant (used to seal off or "lock-down" minute asbestos fibers left on surfaces from which asbestos containing material has been removed).

1.2.13 Friable Asbestos Material

One percent asbestos containing material that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

1.2.14 Glovebag Technique

Those asbestos removal and control techniques put forth in 29 CFR 1926.1101 Appendix G.

1.2.15 HEPA Filter Equipment

High efficiency particulate air (HEPA) filtered vacuum and/or exhaust ventilation equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall retain 99.97 percent of particles 0.3 microns or larger as indicated in UL 586.

1.2.16 Navy Consultant (NC)

That qualified person employed directly by the Government to monitor, sample, inspect the work or in some other way advise the Contracting Officer. The NC is normally a private consultant, but can be an employee of the Government.

1.2.17 Negative Pressure Enclosure (NPE)

That engineering control technique described as a negative pressure enclosure in 29 CFR 1926.1101.

1.2.18 Nonfriable Asbestos Material

Material that contains asbestos in which the fibers have been immobilized by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not normally release asbestos fibers during any appropriate use, handling, storage or transportation. It is understood that asbestos fibers may be released under other conditions such as demolition, removal, or mishap.

1.2.19 Personal Sampling

Air sampling which is performed to determine asbestos fiber concentrations within the breathing zone of a specific employee, as performed in accordance with 29 CFR 1926.1101.

1.2.20 Private Qualified Person (PQP)

That qualified person hired by the Contractor to perform the herein listed tasks.

1.2.21 Qualified Person (QP)

A Registered Architect, Professional Engineer, Certified Industrial Hygienist, consultant or other qualified person who has successfully completed training and is therefore accredited under a legitimate State Model Accreditation Plan as described in 40 CFR 763 as a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer; and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The QP must be qualified to perform visual inspections as indicated in ASTM E1368. The QP shall be appropriately licensed in the State of Hawaii.

1.2.22 TEM

Refers to Transmission Electron Microscopy.

1.2.23 Time Weighted Average (TWA)

The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers.

1.2.24 Wetting Agent

A chemical added to water to reduce the water's surface tension thereby increasing the water's ability to soak into the material to which it is applied. An equivalent wetting agent must have a surface tension of at most 0.00042 psi.

1.3 REQUIREMENTS

1.3.1 Description of Work

The work covered by this section includes the handling and control of asbestos containing materials and describes some of the resultant procedures and equipment required to protect workers, the environment and occupants of the building or area, or both, from contact with airborne asbestos fibers. The work also includes the disposal of any asbestos containing materials generated by the work. More specific operational procedures shall be outlined in the Asbestos Hazard Abatement Plan called for elsewhere in this specification. The asbestos work includes the demolition and removal or encapsulation of Asbestos Containing Materials (ACM)which is governed by 40 CFR 763. Under normal conditions non-friable or chemically bound materials containing asbestos would not be considered hazardous; however, this material may release airborne asbestos fibers during demolition and removal and therefore must be handled in accordance with the removal and disposal procedures as specified herein. Provide negative pressure enclosure techniques as outlined in this specification. The Navy will evacuate the work area during the asbestos abatement work. All asbestos removal work shall be supervised by a competent person as specified herein.

1.3.1.1 Wallboard/Joint Compound

Both composite samples of the wallboard and discrete samples of the components (wallboard and joint compound) have been tested and results are attached as indicated in each task order.

1.3.2 Medical Requirements

Provide medical requirements including but not limited to medical surveillance and medical record keeping as listed in 29 CFR 1926.1101.

1.3.2.1 Medical Examinations

Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1926.1101 or other pertinent State or local directives. This requirement must have been satisfied within the 12 months prior to the start of work on this contract. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. Specifically identify x-ray films of asbestos workers to the consulting radiologist and mark medical record jackets with the word "ASBESTOS."

1.3.2.2 Medical Records

Maintain complete and accurate records of employees' medical examinations, medical records, and exposure data for a period of 50 years after termination of employment and make records of the required medical examinations and exposure data available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health (OSHA), or authorized representatives of them, and an employee's physician upon the request of the employee or former employee.

1.3.3 Employee Training

Submit certificates, prior to the start of work but after the main abatement submittal, signed by each employee indicating that the employee has received training in the proper handling of materials and wastes that contain asbestos in accordance with 40 CFR 763; understands the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of the respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in 29 CFR 1926.1101 on an initial and annual basis. Certificates shall be organized by individual worker, not grouped by type of certification. Post appropriate evidence of compliance with the training requirements of 40 CFR 763. Train all personnel involved in the asbestos control work in accordance with United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) training criteria or State training criteria whichever is more stringent. The Contractor shall document the training by providing: dates of training, training entity, course outline, names of instructors, and qualifications of instructors upon request by the Contracting Officer. Furnish each employee with respirator training and fit testing administered by the PQP as required by 29 CFR 1926.1101. Fully cover engineering and other hazard control techniques and procedures. All asbestos workers shall

have a current State of Hawaii asbestos worker's license.

1.3.4 Permits , Licenses, and Notifications

Obtain necessary permits and licenses in conjunction with asbestos removal, encapsulation, hauling, and disposition, and furnish notification of such actions required by Federal, State, regional, and local authorities prior to the start of work. Notify the State's environmental protection agency and the Contracting Officer in writing 20 working days prior to commencement of work in accordance with 40 CFR 61-SUBPART M and 16 VAC 25-20-30. Notify the Contracting Officer and other appropriate Government agencies in writing 20 working days prior to the start of asbestos work as indicated in applicable laws, ordinances, criteria, rules, and regulations. Submit copies of all Notifications to the Contracting Officer. Notify the local fire department 3 days prior to removing fire-proofing material from the building including notice that the material contains asbestos.

1.3.5 Environment, Safety and Health Compliance

In addition to detailed requirements of this specification, comply with those applicable laws, ordinances, criteria, rules, and regulations of Federal, State, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.1101, 40 CFR 61-SUBPART A, 40 CFR 61-SUBPART M, and ND OPNAVINST 5100.23. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the Government shall apply. The following laws, ordinances, criteria, rules and regulations regarding removal, handling, storing, transporting and disposing of asbestos materials.

1.3.6 Respiratory Protection Program

Establish and implement a respirator program as required by AIHA Z88.6, 29 CFR 1926.1101, and 29 CFR 1926.103. Submit a written description of the program to the Contracting Officer. Submit a written program manual or operating procedure including methods of compliance with regulatory statutes.

1.3.6.1 Respirator Program Records

Submit records of the respirator program as required by AIHA Z88.6, 29 CFR 1926.103, and 29 CFR 1926.1101.

1.3.7 Asbestos Hazard Control Supervisor

The Contractor shall be represented on site by a supervisor, trained using the model Contractor accreditation plan as indicated in the Federal statutes for all portions of the herein listed work.

1.3.8 Hazard Communication

Adhere to all parts of 29 CFR 1926.59 and provide the Contracting Officer with a copy of the Material Safety Data Sheets (MSDS) for all materials brought to the site.

1.3.9 Asbestos Hazard Abatement Plan

Submit a detailed plan of the safety precautions such as lockout, tagout, tryout, fall protection, and confined space entry procedures and equipment and work procedures to be used in the encapsulation, removal, and/or demolition of materials containing asbestos. The plan, not to be combined with other hazard abatement plans, shall be prepared, signed, and sealed by the PQP. Provide a Table of Contents for each abatement submittal, which shall follow the sequence of requirements in the contract. Such plan shall include but not be limited to the precise personal protective equipment to be used including, but not limited to, respiratory protection, type of whole-body protection and if reusable coveralls are to be employed decontamination methods (operations and quality control plan), the location of asbestos control areas including clean and dirty areas, buffer zones, showers, storage areas, change rooms, removal and/or encapsulation method, interface of trades involved in the construction, sequencing of asbestos related work, disposal plan, type of wetting agent and asbestos sealer to be used, locations of local exhaust equipment, planned air monitoring strategies, and a detailed description of the method to be employed in order to control environmental pollution. The plan shall also include (both fire and medical emergency) response plans. The Asbestos Hazard Abatement Plan must be approved in writing prior to starting any asbestos work. The Contractor, Asbestos Hazard Control Supervisor, and PQP shall meet with the Contracting Officer prior to beginning work, to discuss in detail the Asbestos Hazard Abatement Plan, including work procedures and safety precautions. Once approved by the Contracting Officer, the plan will be enforced as if an addition to the specification. Any changes required in the specification as a result of the plan shall be identified specifically in the plan to allow for free discussion and approval by the Contracting Officer prior to starting work.

1.3.10 Testing Laboratory

Submit the name, address, and telephone number of each testing laboratory selected for the sampling, analysis, and reporting of airborne concentrations of asbestos fibers along with evidence that each laboratory selected holds the appropriate State license and/or permits and certification that each laboratory is American Industrial Hygiene Association (AIHA) accredited and that persons counting the samples have been judged proficient by current inclusion on the AIHA Asbestos Analysis Registry (AAR) and successful participation of the laboratory in the Proficiency Analytical Testing (PAT) Program. Where analysis to determine asbestos content in bulk materials or transmission electron microscopy is required, submit evidence that the laboratory is accredited by the National Institute of Science and Technology (NIST) under National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis. The testing laboratory firm shall be independent of the asbestos contractor and shall have no employee or employer relationship which could constitute a conflict of interest.

1.3.11 Landfill Approval

Submit written evidence that the landfill is for asbestos disposal by the U.S. Environmental Protection Agency, Region 3, Air Enforcement Section (38W12), and local regulatory agencies. Within 3 working days after delivery, submit detailed delivery tickets, prepared, signed, and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill. Submit a copy of the waste shipment records within 1 day of the shipment leaving the project site.

1.3.12 Medical Certification

Provide a written certification for each worker and supervisor, signed by a licensed physician indicating that the worker and supervisor has met or exceeded all of the medical prerequisites listed herein and in 29 CFR 1926.1101 and 29 CFR 1926.103 as prescribed by law. Submit certificates prior to the start of work but after the main abatement submittal.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Local exhaust equipment; G

Vacuums; G

Respirators; G

Pressure differential automatic recording instrument; G

Amended water; G

Glovebags; G

Material Safety Data Sheets (MSDS) for all materials proposed for transport to the project site; G

Encapsulants; G

SD-06 Test Reports

Air sampling results; G

Pressure differential recordings for local exhaust system; G

Asbestos disposal quantity report; G

Encapsulation test patches; G

Clearance sampling; G

SD-07 Certificates

Asbestos hazard abatement plan; G

Testing laboratory; G

Private qualified person documentation; G

Contractor's license; G

Competent person documentation; G

Worker's license; G

Landfill approval; G

Employee training; G

Medical certification requirements; G

Waste shipment records and if applicable exemption report; G

Respiratory Protection Program; G

Delivery tickets; G

Vacuums; G

Water filtration equipment; G

Ventilation systems; G

Other equipment used to contain airborne asbestos fibers; G

Chemical encapsulants sealers;; G

Notifications

Show compliance with ASSE Z9.2 by providing manufacturers' certifications.

SD-11 Closeout Submittals

Notifications; G

Rental equipment; G

Respirator program records; G

Permits and licenses

Protective clothing decontamination quality control records; G

Protective clothing decontamination facility notification; G

1.5 QUALITY ASSURANCE

1.5.1 Private Qualified Person Documentation

Submit the name, address, and telephone number of the Private Qualified Person (PQP) selected to prepare the Asbestos Hazard Abatement Plan, direct monitoring and training, and documented evidence that the PQP has successfully completed training in and is accredited and where required is certified as, a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer as described by 40 CFR 763 and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The PQP shall be appropriately licensed in the State of Hawaii. The PQP and the asbestos contractor shall not have an employee/employer relationship or financial relationship which could

constitute a conflict of interest. The PQP shall be a first tier subcontractor.

1.5.2 Competent Person Documentation

Submit training certification and a current State of Hawaii Asbestos Contractor's and Supervisor's License.

1.5.3 Worker's License

Submit documentation that requires all workers have a current State of Hawaii Asbestos Workers License.

1.5.4 Contractor's License

Contractor shall have current asbestos contractor's license. Submit a copy of the asbestos contractor's license issued by the State of Hawaii.

1.5.5 Air Sampling Results

Complete fiber counting and provide results to the PQP and NC for review within 16 hours of the "time off" of the sample pump. Notify the Contracting Officer immediately of any airborne levels of asbestos fibers in excess of the acceptable limits. Submit sampling results to the Contracting Officer and the affected Contractor employees where required by law within 3 working days, signed by the testing laboratory employee performing air sampling, the employee that analyzed the sample, and the PQP and NC. Notify the Contractor and the Contracting Officer immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.01 fibers per cubic centimeter or background whichever is higher. In no circumstance shall levels exceed 0.1 fibers per cubic centimeter.

1.5.6 Pressure Differential Recordings for Local Exhaust System

Provide a local exhaust system that creates a negative pressure of at least 0.02 inches of water relative to the pressure external to the enclosure and operate it continuously, 24 hours a day, until the temporary enclosure of the asbestos control area is removed. Submit pressure differential recordings for each work day to the PQP and NC for review and to the Contracting Officer within 24 hours from the end of each work day.

1.5.7 Protective Clothing Decontamination Quality Control Records

Provide all records that document quality control for the decontamination of reusable outer protective clothing.

1.5.8 Protective Clothing Decontamination Facility Notification

Submit written evidence that persons who decontaminate, store, or transport asbestos contaminated clothing used in the performance of this contract were duly notified in accordance with 29 CFR 1926.1101.

1.6 EQUIPMENT

1.6.1 Rental Equipment

Provide a copy of the written notification to the rental company concerning the intended use of the equipment and the possibility of asbestos

contamination of the equipment.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Shall conform to current USEPA requirements, shall contain no toxic or hazardous substances as defined in 29 CFR 1926.59, and shall conform to the following performance requirements.

2.1.1 Removal Encapsulants

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.2 Bridging Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test

Requirement	Test Standard
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.3 Penetrating Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Cohesion/Adhesion Test - 50 pounds of force/foot	ASTM E119
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E119
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522/D522M Mandrel Bend Test

2.1.4 Lock-down Encapsulant

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E84
Life Expectancy - 20 years	ASTM C732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E96/E96M
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E119

Requirement	Test Standard
Bond Strength: 100 pounds of force/foot	ASTM E736
(Tests compatibility with cementitious and fibrous fireproofing)	

PART 3 EXECUTION

3.1 EQUIPMENT

At all times, provide the Contracting Officer or the Contracting Officer's Representative, with at least two complete sets of personal protective equipment as required for entry to and inspection of the asbestos control area. Provide equivalent training to the Contracting Officer or a designated representative as provided to Contractor employees in the use of the required personal protective equipment. Provide manufacturer's certificate of compliance for all equipment used to contain airborne asbestos fibers.

3.1.1 Respirators

Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

3.1.1.1 Respirators for Handling Asbestos

Provide personnel engaged in pre-cleaning, cleanup, handling, encapsulation removal and or demolition of asbestos materials with respiratory protection as indicated in 29 CFR 1926.1101 and 29 CFR 1926.103.

3.1.2 Exterior Whole Body Protection

3.1.2.1 Outer Protective Clothing

Provide personnel exposed to asbestos with disposable "non-breathable," or reusable "non-breathable" whole body outer protective clothing, head coverings, gloves, and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Make sleeves secure at the wrists, make foot coverings secure at the ankles, and make clothing secure at the neck by the use of tape. Reusable whole body outer protective clothing shall be either disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area or be properly decontaminated.

3.1.2.2 Work Clothing

Provide cloth work clothes for wear under the outer protective clothing and foot coverings and either dispose of or properly decontaminate them as recommended by the PQP after each use.

3.1.2.3 Personal Decontamination Unit

Provide a temporary, negative pressure unit with a separate decontamination

locker room and clean locker room with a shower that complies with 29 CFR 1926.51(f)(4)(ii) through (V) in between for personnel required to wear whole body protective clothing. Provide two separate lockers for each asbestos worker, one in each locker room. Keep street clothing and street shoes in the clean locker. HEPA vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators at the boundary of the asbestos work area and seal in impermeable bags or containers for disposal. HEPA vacuum and remove asbestos contaminated reusable protective clothing while still wearing respirators at the boundary of the asbestos work area, seal in two impermeable bags, label outer bag as asbestos contaminated waste, and transport for decontamination. Do not wear work clothing between home and work. Locate showers between the decontamination locker room and the clean locker room and require that all employees shower before changing into street clothes. Collect used shower water and filter with approved water filtration equipment to remove asbestos contamination. Dispose of filters and residue as asbestos waste. Discharge clean water to the sanitary system. Dispose of asbestos contaminated work clothing as asbestos contaminated waste or properly decontaminate as specified in the Contractor's Asbestos Hazard Abatement Plan. Decontamination units shall be physically attached to the asbestos control area. Build both a personnel decontamination unit and an equipment decontamination unit onto and integral with each asbestos control area.

3.1.2.4 Decontamination of Reusable Outer Protective Clothing

When reusable outer protective clothing is used, transport the double bagged clothing to a previously notified commercial/industrial decontamination facility for decontamination. Perform non-destructive testing to determine the effectiveness of asbestos decontamination. If representative sampling is used, ensure the statistical validity of the sampling results. If representative sampling is used, reject any entire batch in which any of the pieces exceed 40 fibers per square millimeter. Inspect reusable protective clothing prior to use to ensure that it will provide adequate protection and is not or is not about to become ripped, torn, deteriorated, or damaged, and that it is not visibly contaminated. Notify, in writing, all personnel involved in the decontamination of reusable outer protective clothing as indicated in 29 CFR 1926.1101.

3.1.2.5 Eye Protection

Provide goggles to personnel engaged in asbestos abatement operations when the use of a full face respirator is not required.

3.1.3 Warning Signs and Labels

Provide warning signs at all approaches to asbestos control areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.

3.1.3.1 Warning Sign

Provide vertical format conforming to 29 CFR 1926.200, and 29 CFR 1926.1101 minimum 20 by 14 inches displaying the following legend in the lower panel:

Legend	Notation
Danger	one inch Sans Serif Gothic or Block
Asbestos	one inch Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	1/4 inch Sans Serif Gothic or Block
Authorized Personnel Only	1/4 inch Sans Serif Gothic or Block
Respirators and Protective Clothing are Required in this Area	1/4 inch Sans Serif Gothic or Block

Spacing between lines shall be at least equal to the height of the upper of any two lines.

3.1.3.2 Warning Labels

Provide labels conforming to 29 CFR 1926.1101 of sufficient size to be clearly legible, displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM

3.1.4 Local Exhaust System

Provide a local exhaust system in the asbestos control area in accordance with ASSE Z9.2 and 29 CFR 1926.1101 that will provide at least four air changes per hour inside of the negative pressure enclosure. Local exhaust equipment shall be operated 24 hours per day, until the asbestos control area is removed and shall be leak proof to the filter and equipped with HEPA filters. Maintain a minimum pressure differential in the control area of minus 0.02 inch of water column relative to adjacent, unsealed areas. Provide continuous 24-hour per day monitoring of the pressure differential with a pressure differential automatic recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control area. Filters on exhaust equipment shall conform to ASSE Z9.2 and UL 586. The local exhaust system shall terminate out of doors and remote from any public access or ventilation system intakes.

3.1.5 Tools

Vacuums shall be leak proof to the filter and equipped with HEPA filters.

Filters on vacuums shall conform to ASSE Z9.2 and UL 586. Do not use power tools to remove asbestos containing materials unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation systems. Remove all residual asbestos from reusable tools prior to storage or reuse.

3.1.6 Rental Equipment

If rental equipment is to be used, furnish written notification to the rental agency concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

3.1.7 Glovebags

Submit written manufacturers proof that glovebags will not break down under expected temperatures and conditions.

3.2 WORK PROCEDURE

Perform asbestos related work in accordance with 29 CFR 1926.1101, 40 CFR 61-SUBPART M, and as specified herein. Use wet or if given prior EPA approval, dry removal procedures appropriate encapsulation procedures as listed in the asbestos hazard abatement plan and negative pressure enclosure techniques. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, drinking, chewing gum, tobacco, or applying cosmetics shall not be permitted in the asbestos work or control areas. Personnel of other trades not engaged in the encapsulation removal and demolition of asbestos containing material shall not be exposed at any time to airborne concentrations of asbestos unless all the personnel protection and training provisions of this specification are complied with by the trade personnel. Seal all roof top penetrations, except plumbing vents, prior to asbestos roofing work. Shut down the building heating, ventilating, and air conditioning system, cap the openings to the system, and provide temporary ventilation, prior to the commencement of asbestos work. Disconnect electrical service when encapsulation wet removal is performed and provide temporary electrical service with verifiable ground fault circuit interrupter (GFCI) protection prior to the use of any water encapsulant. If an asbestos fiber release or spill occurs outside of the asbestos control area, stop work immediately, correct the condition to the satisfaction of the Contracting Officer including clearance sampling, prior to resumption of work.

3.2.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent work. Where such work is damaged or contaminated as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust, or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, stop work immediately. Then clean up the spill. When satisfactory visual inspection and air sampling results are obtained from the PQP work may proceed at the discretion of the Contracting Officer.

3.2.2 Furnishings

Furniture and equipment will remain in the building. Cover and seal furnishings with 6-mil plastic sheet or remove from the work area and store

in a location on site approved by the Contracting Officer.

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3.2.3 Precleaning

Wet wipe and HEPA vacuum all surfaces potentially contaminated with asbestos prior to establishment of an enclosure.

3.2.4 Asbestos Control Area Requirements

3.2.4.1 Negative Pressure Enclosure

Block and seal openings in areas where the release of airborne asbestos fibers can be expected. Establish an asbestos negative pressure enclosure with the use of curtains, portable partitions, or other enclosures in order to prevent the escape of asbestos fibers from the contaminated asbestos work area. Negative pressure enclosure development shall include protective covering of uncontaminated walls, and ceilings with a continuous membrane of two layers of minimum 6-mil plastic sheet sealed with tape to prevent water or other damage. Provide two layers of 6-mil plastic sheet over floors and extend a minimum of 12 inches up walls. Seal all joints with tape. Provide local exhaust system in the asbestos control area. Openings will be allowed in enclosures of asbestos control areas for personnel and equipment entry and exit, the supply and exhaust of air for the local exhaust system and the removal of properly containerized asbestos containing materials. Replace local exhaust system filters as required to maintain the efficiency of the system.

3.2.4.2 Glovebag

The construction of a negative pressure enclosure is infeasible for the removal and/or encapsulation of Asbestos Containing Materials. Use alternate techniques as indicated in 29 CFR 1926.1101. Establish designated limits for the asbestos regulated area with the use of rope or other continuous barriers, and maintain all other requirements for asbestos control areas. The PQP shall conduct personal samples of each worker engaged in asbestos handling (removal, disposal, transport and other associated work) throughout the duration of the project. If the quantity of airborne asbestos fibers monitored at the breathing zone of the workers at any time exceeds background or 0.01 fibers per cubic centimeter whichever is greater, stop work, evacuate personnel in adjacent areas or provide personnel with approved protective equipment at the discretion of the Contracting Officer. This sampling may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those obtained by the Contractor, the Government will determine which results predominate. If adjacent areas are contaminated as determined by the Contracting Officer, clean the contaminated areas, monitor, and visually inspect the area as specified herein.

3.2.5 Removal Procedures

Wet asbestos material with a fine spray of amended water during removal, cutting, or other handling so as to reduce the emission of airborne fibers. Remove material and immediately place in 6 mil plastic disposal bags. Remove asbestos containing material in a gradual manner, with continuous application of the amended water or wetting agent in such a manner that no asbestos material is disturbed prior to being adequately

wetted. Where unusual circumstances prohibit the use of 6 mil plastic bags, submit an alternate proposal for containment of asbestos fibers to the Contracting Officer for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation, wrap the pipes and insulation in plastic and remove the pipe by sections. Asbestos containing material shall be containerized while wet. At no time shall asbestos material be allowed to accumulate or become dry. Lower and otherwise handle asbestos containing material as indicated in 40 CFR 61-SUBPART M.

3.2.5.1 Sealing Contaminated Items Designated for Disposal

Remove contaminated architectural, mechanical, and electrical appurtenances such as venetian blinds, full-height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit, panels, and other contaminated items designated for removal by completely coating the items with an asbestos lock-down encapsulant at the demolition site before removing the items from the asbestos control area. These items need not be vacuumed. The asbestos lock-down encapsulant shall be tinted a contrasting color. It shall be spray-applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces. Lock-down encapsulants shall comply with the performance requirements specified herein.

3.2.5.2 Exposed Pipe Insulation Edges

Contain edges of asbestos insulation to remain that are exposed by a removal operation. Wet and cut the rough ends true and square with sharp tools and then encapsulate the edges with a 1/4 inch thick layer of non-asbestos containing insulating cement troweled to a smooth hard finish. When cement is dry, lag the end with a layer of non-asbestos lagging cloth, overlapping the existing ends by at least 4 inches. When insulating cement and cloth is an impractical method of sealing a raw edge of asbestos, take appropriate steps to seal the raw edges as approved by the Contracting Officer.

3.2.6 Encapsulation Procedures

3.2.6.1 Preparation of Test Patches

Install three test patches of encapsulant, as indicated. Use airless spray at the lowest pressure and as recommended by the encapsulant manufacturer. Follow exactly the manufacturer's instructions for thinning recommendations, application procedures and rates. Curing time shall be not less than five days or that recommended by the manufacturer, whichever is more. A test patch shall be 9 square feet in size.

3.2.6.2 Field Testing

Field test the encapsulation test patches in accordance with ASTM E1494, paragraph "Required Field Test," in the presence of the Contracting Officer. Keep a written record of the testing procedures and test results. Upon successful testing of the encapsulant, submit a signed statement to the Contracting Officer certifying that the encapsulant is suitable for installation on the particular asbestos containing material.

3.2.6.3 Large-Scale Application

Apply encapsulant using the same equipment and procedures as employed for

the test patches. Keep the encapsulant material stirred to prevent settling. Keep a clean work area. Change pre-filters in the ventilation equipment as soon as they appear clogged by encapsulant aerosol or pressure differential drops below 0.02 Hg.

3.2.7 Air Sampling

Sampling of airborne concentrations of asbestos fibers shall be performed in accordance with 29 CFR 1926.1101 and as specified herein. Sampling performed in accordance with 29 CFR 1926.1101 shall be performed by the PQP. Sampling performed for environmental and quality control reasons shall be performed by the PQP . Unless otherwise specified, use NIOSH Method 7400 for sampling and analysis. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those results obtained by the Contractor, the Government will determine which results predominate.

3.2.7.1 Sampling Prior to Asbestos Work

Provide area air sampling and establish the baseline one day prior to the masking and sealing operations for each demolition, removal, and/or encapsulation site. Establish the background by performing area sampling in similar but uncontaminated sites in the building.

3.2.7.2 Sampling During Asbestos Work

The PQP shall provide personal and area sampling as indicated in 29 CFR 1926.1101 and governing environmental regulations. In addition, provided the same type of work is being performed, provide area sampling at least once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately. Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.

The PQP shall provide personal sampling as indicated in 29 CFR 1926.1101. At the same time the NC will provide area sampling close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. In addition, provided the same type of work is being performed, the NC will provide area sampling once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately. Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.

3.2.7.3 Sampling After Final Clean-Up (Clearance Sampling)

Provide area sampling of asbestos fibers using aggressive air sampling techniques as defined in the EPA 560/5-85-024 and establish an airborne

asbestos concentration of less than 0.01 fibers per cubic centimeter after final clean-up but before removal of the enclosure or the asbestos work control area. After final cleanup and the asbestos control area is dry but prior to clearance sampling, the PQP and NC shall perform a visual inspection in accordance with ASTM E1368 to ensure that the asbestos control and work area is free of any accumulations of dirt, dust, or debris. Prepare a written report signed and dated by the PQP documenting that the asbestos control area is free of dust, dirt, and debris and all waste has been removed. Perform at least three samples. Use transmission electron microscopy (TEM) to analyze clearance samples and report the results in accordance with current NIOSH criteria. The asbestos fiber counts from these samples shall be less than 0.01 fibers per cubic centimeter or be not greater than the background, whichever is greater. Should any of the final samples indicate a higher value, the Contractor shall take appropriate actions to re-clean the area and shall repeat the sampling and TEM analysis at the Contractor's expense.

3.2.8 Lock-Down

Prior to removal of plastic barriers and after pre-clearance clean up of gross contamination, the PQP shall conduct a visual inspection of all areas affected by the removal and/or encapsulation in accordance with ASTM E1368. Inspect for any visible fibers , and to ensure that encapsulants were applied evenly and appropriately. A post removal (lock-down) encapsulant shall then be spray applied to ceiling, walls, floors and other areas exposed in the removal area. The exposed area shall include but not be limited to plastic barriers, furnishings and articles to be discarded as well as dirty change room, air locks for bag removal and decontamination chambers.

3.2.9 Site Inspection

While performing asbestos engineering control work, the Contractor shall be subject to on-site inspection by the Contracting Officer who may be assisted by or represented by safety or industrial hygiene personnel. If the work is found to be in violation of this specification, the Contracting Officer or his representative will issue a stop work order to be in effect immediately and until the violation is resolved. All related costs including standby time required to resolve the violation shall be at the Contractor's expense.

3.3 CLEAN-UP AND DISPOSAL

3.3.1 Housekeeping

Essential parts of asbestos dust control are housekeeping and clean-up procedures. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Give meticulous attention to restricting the spread of dust and debris; keep waste from being distributed over the general area. Use HEPA filtered vacuum cleaners. DO NOT BLOW DOWN THE SPACE WITH COMPRESSED AIR. When asbestos removal is complete, all asbestos waste is removed from the work-site, and final clean-up is completed, the Contracting Officer will attest that the area is safe before the signs can be removed. After final clean-up and acceptable airborne concentrations are attained but before the HEPA unit is turned off and the enclosure removed, remove all pre-filters on the building HVAC system and provide new pre-filters. Dispose of filters as asbestos contaminated materials. Reestablish HVAC mechanical, and electrical systems in proper working order. The Contracting Officer will visually inspect all surfaces within

the enclosure for residual material or accumulated dust or debris. The Contractor shall re-clean all areas showing dust or residual materials. If re-cleaning is required, air sample and establish an acceptable asbestos airborne concentration after re-cleaning. The Contracting Officer must agree that the area is safe in writing before unrestricted entry will be permitted. The Government shall have the option to perform monitoring to determine if the areas are safe before entry is permitted.

3.3.2 Title to Materials

All waste materials, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, State, and Federal regulations and herein.

3.3.3 Disposal of Asbestos

3.3.3.1 Procedure for Disposal

Collect asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 6 mils thick, cartons, drums or cans). Wastes within the containers must be adequately wet in accordance with 40 CFR 61-SUBPART M. Affix a warning and Department of Transportation (DOT) label to each container including the bags or use at least 6 mils thick bags with the approved warnings and DOT labeling preprinted on the bag. The name of the waste generator and the location at which the waste was generated shall be clearly indicated on the outside of each container. Prevent contamination of the transport vehicle (especially if the transport vehicle is a rented truck likely to be used in the future for non-asbestos purposes). These precautions include lining the vehicle cargo area with plastic sheeting (similar to work area enclosure) and thorough cleaning of the cargo area after transport and unloading of asbestos debris is complete. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or State-approved asbestos landfill off Government property. For temporary storage, store sealed impermeable bags in asbestos waste drums or skids. An area for interim storage of asbestos waste-containing drums or skids will be assigned by the Contracting Officer or his authorized representative. Procedure for hauling and disposal shall comply with 40 CFR 61-SUBPART M, State, regional, and local standards. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be recycled. Workers unloading the sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

3.3.3.2 Asbestos Disposal Quantity Report

Direct the PQP to record and report, to the Contracting Officer, the amount of asbestos containing material removed and released for disposal. Deliver the report for the previous day at the beginning of each day shift with amounts of material removed during the previous day reported in linear feet or square feet as described initially in this specification and in cubic feet for the amount of asbestos containing material released for disposal.

-- End of Section --

SECTION 02 82 33.13 20

REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD
08/11

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780	(1995; Errata Aug 1996;Rev Ch. 7 - 1997) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

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

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.33	Access to Employee Exposure and Medical Records
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and

	Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Abatement

As applied to target housing and child occupied facilities, "abatement" means any set of measures designed to permanently eliminate lead-based paint hazards in accordance with standards established by appropriate Federal agencies. Such term includes:

a. The removal of lead-based paint and lead-contaminated dust, the permanent containment or encapsulation of lead-based paint, the replacement of lead-painted surfaces or fixtures, and the removal or covering of lead contaminated soil; and

b. All preparation, cleanup, disposal, and post-abatement clearance testing activities associated with such measures.

1.2.2 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period in a work environment.

1.2.3 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries, which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel.

1.2.4 Child Occupied Facility

A building or portion of a building constructed prior to 1978 visited regularly by the same child, 6 years of age or under, on a least two different days within any week, provided each days visit last at least 3 hours and the combined weekly visit last at least 6 hours and the combined annual visit last at least 60 hours. Child occupied facilities may include, but are not limited to day-care centers, preschools and kindergarten classrooms.

1.2.5 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations. A Certified Industrial Hygienist (CIH) certified for comprehensive practice by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.6 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment (PPE).

1.2.7 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.8 Deleading

Activities conducted by a person who offers to eliminate lead-based paint or lead-based paint hazards or to plan such activities in commercial buildings, bridges or other structures.

1.2.9 Eight-Hour Time Weighted Average (TWA)

Airborne concentration of lead to which an employee is exposed, averaged over an 8 hour workday as indicated in 29 CFR 1926.62.

1.2.10 High Efficiency Particulate Air (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron or larger size particles.

1.2.11 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps.

1.2.12 Lead-Based Paint (LBP)

Paint or other surface coating that contains lead in excess of 1.0 milligrams per centimeter squared or 0.5 percent by weight.

1.2.13 Lead-Based Paint Activities

In the case of target housing or child occupied facilities, lead-based paint activities include; a lead-based paint inspection, a risk assessment, or abatement of lead-based paint hazards.

1.2.14 Lead-Based Paint Hazard (LBP Hazard)

Any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, lead-based paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects.

1.2.15 Paint with Lead (PWL)

Any paint that contains lead as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of lead are found using a quantitative method for analyzing paint using laboratory instruments with specified limits of detection (usually 0.01 percent). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.16 Lead Control Area

A system of control methods to prevent the spread of lead dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.17 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a workday, the PEL shall be determined by the following formula:

PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

1.2.18 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.19 Physical Boundary

Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean the same as "outside lead control area but inside the physical boundary."

1.2.20 Target Housing

Housing constructed prior to 1978. It does not include housing for the elderly, or persons with disabilities unless any one or more children age 6 years and younger resides or is expected to reside in such housing.

1.3 DESCRIPTION

1.3.1 Description of Work

Remove/control lead-based / paint with lead in intact, flaking, chalking, chipped, or peeling condition, as indicated in each task order.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Removal/Control Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead activities.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Vacuum Filters; G

Respirators; G

SD-06 Test Reports

sampling results; G

Occupational and Environmental Assessment Data Report; G

SD-07 Certificates

Qualifications of CP; G

Testing Laboratory qualifications; G

Occupant Notification; G

Training Certification of workers and supervisors; G

Notification of the Commencement of LBP Hazard Abatement; G

Third Party Consultant Qualifications; G

Lead-based paint/paint with lead removal/control plan including CP approval (signature, date, and certification number); G

Rental equipment notification; G

Respiratory Protection Program; G

Hazard Communication Program; G

EPA or State approved hazardous waste treatment, storage, or disposal facility for lead disposal; G

Lead Waste Management Plan; G

Vacuum filters; G

Clearance Certification; G

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility; G

Certification of Medical Examinations; G

Employee Training Certification; G

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Qualifications of CP

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide previous experience of the CP. Submit proper documentation that the CP is trained and licensed and certified in accordance with Federal, State, and local laws.

1.5.1.2 Training Certification

Submit a certificate for each employee and supervisor, signed and dated by the authorized training provider meeting 40 CFR 745 (Subpart L) requirements, stating that the employee or supervisor has received the required lead training and is certified to perform or supervise deleading or lead removal. Submit proof the work will be performed by a certified firm.

1.5.1.3 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the air and wipe and soil sampling, testing, and reporting of airborne concentrations of lead. Use a laboratory accredited under the EPA National Lead Laboratory Accreditation Program (NLLAP) by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.1.4 Third Party Consultant Qualifications

Submit the name, address, and telephone number of the third party consultant selected to perform the wipe sampling for determining concentrations of lead in dust or soil sampling. Submit proper documentation that the consultant is trained and certified as an inspector technician or inspector/risk assessor by the USEPA authorized State (or local) certification and accreditation program.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

a. Verify training meets all federal, State, and local requirements.

b. Review and approve lead-based paint/paint with lead removal/control plan for conformance to the applicable standards. Ensure work is performed in strict accordance with specifications at all times.

c. Continuously inspect lead-based paint removal/control work for conformance with the approved plan.

d. Perform air and wipe sampling.

e. Control work to prevent hazardous exposure to human beings and to the environment at all times.

f. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead-Based Paint/Paint with Lead Removal/Control Plan (LBP/PWL R/CP)

Submit a detailed job-specific plan of the work procedures to be used in the removal/control of LBP/PWL. The plan shall include a sketch showing the location, size, and details of lead control areas, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include a description of equipment and materials, controls and job responsibilities for each activity from which lead is emitted. Include in the plan, eating, drinking, smoking and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and paint debris disposal plan, air sampling plan, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that lead is not released outside the lead control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training, sampling methodology, frequency, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multi-contractor worksites to inform affected employees and to clarify responsibilities to control exposures.

The Removal/Control Plan shall be developed by a certified planner/project designer.

In occupied buildings, the Removal/Control Plan shall also include an occupant protection program that describes the measures that will be taken during the work to protect the building occupants.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

In order to reduce the full implementation of 29 CFR 1926.62, the Contractor shall provide documentation. Submit a report that supports the determination to reduce full implementation of the requirements of 29 CFR 1926.62 and supporting the Lead Removal/Control Plan.

a. The initial monitoring shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the

worker's regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of 29 CFR 1926.62 with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, rivet busting, cleanup of dry expendable abrasives, abrasive blast enclosure removal, abrasive blasting, welding, cutting and torch burning where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the lead compliance plan per 29 CFR 1926.62.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62, and 29 CFR 1926.103. Maintain complete and accurate medical records of employees for a period of at least 30 years or for the duration of employment plus 30 years, whichever is longer.

1.5.2.5 Training

Train each employee performing paint removal, disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. Establish and implement a respiratory protection program as required by AIHA Z88.6, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Lead Waste Management

The Lead Waste Management Plan shall comply with applicable requirements of federal, State, and local hazardous waste regulations and address:

a. Identification and classification of hazardous wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and operator and a 24-hour point of contact. Furnish two copies of proof of EPA State and local hazardous waste permit applications permits manifests and EPA Identification numbers Transporter Number.

d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.

g. Work plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily. Proper containment of the waste includes using acceptable waste containers (e.g., 55-gallon drums) as well as proper marking/labeling of the containers.

h. Unit cost for waste disposal according to this plan.

1.5.2.9 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of Federal, State, and local authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply.

Licensing and certification in the State of Hawaii is required.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the lead waste management plan and the lead-based paint/paint with lead removal/control plan, including work procedures and precautions for the removal plan.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable or uncontaminated, reusable protective whole body clothing, head

covering, gloves, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during lead-based paint handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Furnish a copy of the written notification to the Contracting Officer.

1.6.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the paint removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.

1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform paint removal work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better.

PART 2 PRODUCTS

Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer 20 days prior to the start of any paint removal work.

b. Occupant Notification

Submit occupant written acknowledgment of the delivery of lead hazard information pamphlet (EPA 747-K-99-001 "Protect Your Family From Lead in Your Home") prior to commencing the renovation work for each affected unit per 40 CFR 745 Subpart E.

c. Notification of the Commencement of LBP Hazard Abatement

Submit a copy of the notification of the commencement of LBP hazard abatement according to the procedures established.

3.1.1.2 Boundary Requirements

a. Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Furnishings

Furniture and equipment will remain in the building. Cover and seal furnishings with 6-mil plastic sheet or remove from the work area and store in a location on site approved by the Contracting Officer.

3.1.1.4 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

3.1.1.5 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.6 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.7 Mechanical Ventilation System

a. Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.62.

b. To the extent feasible, use local exhaust ventilation connected to HEPA filters or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.

c. Vent local exhaust outside the building only and away from building ventilation intakes.

d. Use locally exhausted, power actuated, paint removal tools.

3.1.1.8 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead

control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Lead Control Area Requirements

Establish a lead control area by situating critical barriers and physical boundaries around the area or structure where LBP/PWL removal/control operations will be performed.

Full containment - Contain removal operations by the use of critical barriers and HEPA filtered exhaust or a negative pressure enclosure system with decontamination facilities and with HEPA filtered exhaust if required by the CP. For containment areas larger than 1,000 square feet install a minimum of two 18 inch square viewing ports. Locate ports to provide a view of the required work from the exterior of the enclosed contaminated area. Glaze ports with laminated safety glass.

3.3 APPLICATION

3.3.1 Work Procedures

Perform removal of lead-based paint in accordance with approved lead-based paint/paint with lead removal/control plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead-based paint is removed in accordance with 29 CFR 1926.62. Dispose of removed paint chips and associated waste in compliance with Environmental Protection Agency (EPA), State, and local requirements.

3.3.2 Lead-Based Paint Removal/Control/Deleading

Manual or power sanding of interior and exterior surfaces is not permitted unless tools are equipped with HEPA attachments or wet methods. The dry sanding or grinding of surfaces that contain lead is prohibited Provide methodology for LBP removal/control in work plan. Remove paint within the areas designated on the drawings in order to completely expose the substrate. Take whatever precautions necessary to minimize damage to the underlying substrate.

Avoid flash rusting or deterioration of the substrate. Provide surface preparations for painting in accord with Section 09 90 00 PAINTS AND COATINGS.

Provide methodology for LBP/PWL removal or abatement/control and processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris/waste and to ensure that unprotected personnel are not exposed to hazardous concentrations of lead. Describe this LBP/PWL removal/control process in the LBP/PWL R/CP.

3.3.2.1 Indoor Paint Removal

Perform manualmechanicalthermal or chemical paint removal in lead control areas using enclosures, barriers, or containments and powered locally exhausted paint removal tools. Collect residue debris for disposal in accordance with federal, State, and local requirements.

3.3.2.2 Outdoor Paint Removal

Perform outdoor removal as indicated in federal, State, and local regulations and in the LBP/CPR/CP. The worksite preparation (barriers or containments) shall be job dependent and presented in the LBP/PWL R/CP.

3.3.3 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

a. Vacuum themselves off.

b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.

c. Shower or wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing; move to an appropriate facility; shower.

d. Change to clean clothes prior to leaving the physical boundary designated around the lead control area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Air sample for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

a. The CP shall be on the job site directing the air and non-clearance wipe sampling and inspecting the lead-based paint removal/control work to ensure that the requirements of the contract have been satisfied during the entire lead-based paint removal operation.

b. Collect personal air samples on employees who are expected to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least 25 percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

c. Submit results of air samples, within 72 hours after the air samples are taken.

d. Before any work begins, a third party consultant shall collect and analyze baseline wipe and soil samples in accordance with methods defined in federal, State, and local standards inside and outside of the physical boundary to assess the degree of dust contamination in the facility prior to lead-based paint removal/control.

e. Collect surface wipe samples at a location no greater than 10 feet outside the lead control area at a frequency of once per day while lead removal work is conducted. Surface wipe results shall meet criteria in paragraph "Clearance Certification."

3.4.1.2 Air Sampling During Paint Removal Work

Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the lead control area.

3.4.1.3 Sampling After Paint Removal/Control

After the visual inspection, conduct soil sampling if bare soil is present during external removal/control operations and collect wipe samples according to the HUD protocol contained in HUD 6780 to determine the lead content of settled dust and dirt in micrograms per square meter foot of surface area and parts per million (ppm) for soil.

3.4.1.4 Testing of Removed Paint and Used Abrasive

Test removed paint and used abrasive in accordance with 40 CFR 261 for hazardous waste.

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the CP. Reclean areas showing dust or residual paint chips or debris. After visible dust, chips and debris is removed, wet wipe and HEPA vacuum all surfaces in the work area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before restarting work.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the lead control area during paint removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62 and 40 CFR 745; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification.

The third party consultant shall certify surface wipe sample results collected inside and outside the work area are less than 200 micrograms per square foot on floors or horizontal surfaces.

For exterior paint removal/control work, soil samples taken at the exterior of the work site shall be used to determine if soil lead levels had increased at a statistically significant level (significant at the 95 percent confidence limit) from the soil lead levels prior to the work. If soil lead levels do show a statistically significant increase or is above any applicable Federal or State standard for lead in soil, the soil shall be remediated back to the pre-work level.

Clear the lead control area in industrial facilities of all visible dust and debris.

For lead-based paint hazard abatement work, surface wipe and soil sampling shall be conducted and clearance determinations made according to the work practice standards presented in 40 CFR 745.227.

3.5.2 Disposal

a. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 262. Dispose of lead-contaminated waste material at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.

b. Place waste materials in U.S. Department of Transportation (49 CFR 178) approved 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. For hazardous waste, the collection drum requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.

c. Handle, transport, and dispose lead or lead-contaminated material classified as hazardous waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

d. All material, whether hazardous or non-hazardous shall be disposed in accordance with laws and provisions and Federal, State, or local regulations. Ensure waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

3.5.2.1 Disposal Documentation

Submit written evidence to demonstrate the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA, State or local regulatory agencies. Submit one copy of the completed hazardous waste manifest, signed and dated by the initial transporter in accordance with 40 CFR 262. Contractor shall provide a certificate that the waste was accepted by the disposal facility. Provide turn-in documents or weight tickets for non-hazardous waste disposal.

3.5.3 Payment for Hazardous Waste

Payment for disposal of hazardous and non-hazardous waste will not be made

until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials or non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 02 83 13.00 20

LEAD IN CONSTRUCTION
08/11

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780	(1995; Errata Aug 1996;Rev Ch. 7 - 1997) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

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

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.33	Access to Employee Exposure and Medical Records
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and

	Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period.

1.2.2 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel (approximately 5 to 6 feet above the floor).

1.2.3 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations and has the authority to take prompt corrective actions to control the lead hazard. A Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.4 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment (PPE).

1.2.5 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.6 High Efficiency Particulate Arrestor (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of

collecting and retaining lead-contaminated particulate. A high efficiency particulate filter demonstrates at least 99.97 percent efficiency against 0.3 micron or larger size particles.

1.2.7 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.

1.2.8 Lead Control Area

A system of control methods to prevent the spread of lead dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.9 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a work day, the PEL shall be determined by the following formula:

PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

1.2.10 Material Containing Lead/Paint with Lead (MCL/PWL)

Any material, including paint, which contains lead as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of lead are found using a quantitative method for analyzing paint or MCL using laboratory instruments with specified limits of detection (usually 0.01 percent). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.11 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.12 Physical Boundary

Area physically roped or partitioned off around lead control area to limit unauthorized entry of personnel.

1.3 DESCRIPTION

1.3.1 Description of Work

Construction activities impacting PWL or material containing lead which are covered by this specification include the demolition and/or removal of material containing lead as indicated in each task order.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead activities.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Occupational and Environmental Assessment Data Report (if objective data is used to justify excluding the initial occupational exposure assessment); G

Lead Compliance Plan including CP approval (signature, date, and certification number); G

Competent Person qualifications; G

Training Certification of workers and supervisors; G

lead waste management plan; G

written evidence that TSD is approved for lead disposal; G

Certification of Medical Examinations; G

SD-06 Test Reports

sampling results; G

Occupational and Environmental Assessment Data Report; G

SD-07 Certificates

Testing laboratory qualifications; G

Occupant Notification; G

Third party consultant qualifications; G

Clearance Certification; G

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility; G

Waste turn-in documents or weight tickets for non-hazardous wastes that are disposed of at sanitary or construction and demolition landfills; G

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Competent Person (CP)

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide documented construction project-related experience with implementation of OSHA's Lead in Construction standard (29 CFR 1926.62) which shows ability to assess occupational and environmental exposure to lead, experience with the use of respirators, personal protective equipment and other exposure reduction methods to protect employee health. Submit proper documentation that the CP is trained and licensed in accordance with federal, State and local laws. The competent person shall be a licensed lead-based paint abatement Supervisor/Project Designer in the State of Hawaii.

1.5.1.2 Training Certification

Submit a certificate for each worker and supervisor, signed and dated by the accredited training provider, stating that the employee has received the required lead training specified in 29 CFR 1926.62(l)and is certified to perform or supervise deleading, lead removal or demolition activities in the state of Hawaii.

1.5.1.3 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the air and wipe analysis, testing, and reporting of airborne concentrations of lead. Use a laboratory participating in the EPA National Lead Laboratory Accreditation Program (NLLAP) by being accredited by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.1.4 Third Party Consultant Qualifications

Submit the name, address and telephone number of the third party consultant selected to perform the wipe sampling for determining concentrations of lead in dust. Submit proper documentation that the consultant is trained and certified as an inspector technician or inspector/risk assessor by the USEPA authorized State (or local) certification and accreditation program.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

a. Verify training meets all federal, State, and local requirements.

b. Review and approve Lead Compliance Plan for conformance to the applicable referenced standards.

c. Continuously inspect PWL or MCL work for conformance with the approved plan.

d. Perform (or oversee performance of) air sampling. Recommend upgrades or downgrades (whichever is appropriate based on exposure) on the use of PPE (respirators included) and engineering controls.

e. Ensure work is performed in strict accordance with specifications at all times.

f. Control work to prevent hazardous exposure to human beings and to the environment at all times.

g. Supervise final cleaning of the lead control area, take clearance wipe samples if necessary; review clearance sample results and make recommendations for further cleaning.

h. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead Compliance Plan

Submit a detailed job-specific plan of the work procedures to be used in the disturbance of PWL or MCL. The plan shall include a sketch showing the location, size, and details of lead control areas, critical barriers, physical boundaries, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include a description of equipment and materials, work practices, controls and job responsibilities for each activity from which lead is emitted. Include in the plan, eating, drinking, smoking, hygiene facilities and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and dust containing lead and debris, air sampling, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that lead is not released outside of the lead control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training and strategy, sampling and analysis strategy and methodology, frequency of sampling, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multicontractor worksites to inform affected employees and to clarify responsibilities to control exposures.

The plan shall be developed by a certified planner/project designer in the State of Hawaii.

In occupied buildings, the plan shall also include an occupant protection program that describes the measures that will be taken during the work to notify and protect the building occupants.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

In order to reduce the full implementation of 29 CFR 1926.62, the Contractor shall provide documentation. Submit a report that supports the determination to reduce full implementation of the requirements of 29 CFR 1926.62 and supporting the Lead Compliance Plan.

a. The initial monitoring shall represent each job classification, or if

working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of 29 CFR 1926.62 with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, rivet busting, cleanup of dry expendable abrasives, abrasive blast enclosure removal, abrasive blasting, welding, cutting and torch burning where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the lead compliance plan per 29 CFR 1926.62.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62 and 29 CFR 1926.103. Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62. Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.

1.5.2.5 Training

Train each employee performing work that disturbs lead, who performs MCL/PWL disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. Establish and implement a respiratory protection program as required by AIHA Z88.6, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Lead Waste Management

The Lead Waste Management Plan shall comply with applicable requirements of federal, State, and local hazardous waste regulations. and address:

a. Identification and classification of wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and operator and a 24-hour point of contact. Furnish two copies of USEPA and local hazardous waste permit applications permits manifests and USEPA Identification numbers.

d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.

g. Work plan and schedule for waste containment, removal and disposal. Proper containment of the waste includes using acceptable waste containers (e.g., 55-gallon drums) as well as proper marking/labeling of the containers. Wastes shall be cleaned up and containerized daily.

h. Include any process that may alter or treat waste rendering a hazardous waste non hazardous.

i. Unit cost for hazardous waste disposal according to this plan.

1.5.2.9 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, State, and local authorities regarding lead. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply. The following State laws, ordinances, criteria, rules and regulations regarding removing, handling, storing, transporting, and disposing of lead-contaminated materials.

Licensing and certification in the state of Hawaii is required.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the Lead Waste Management Plan and the Lead Compliance Plan, including procedures and precautions for the work.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust, fume and mist. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable or uncontaminated, reusable protective whole body clothing, head covering, gloves, eye, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during PWL or MCL handling and disposal, notify the rental agency in writing concerning the intended use of the equipment.

1.6.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the lead removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, eye, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.

1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better as determined by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer 20 days prior to the start of any lead work.

b. Occupant Notification

Submit occupant written acknowledgment of the delivery of lead hazard information pamphlet (EPA 747-K-99-001 "Protect Your Family From Lead in Your Home") prior to commencing the renovation work for each affected unit using language provided in 40 CFR 745 Subpart E.

3.1.1.2 Lead Control Area

a. Physical Boundary - Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside of the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Furnishings

Furniture and equipment will remain in the lead control area. Protect and cover furnishings or remove furnishings from the work area and store in a location approved by the Contracting Officer.

3.1.1.4 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

3.1.1.5 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.6 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.7 Mechanical Ventilation System

a. To the extent feasible, use local exhaust ventilation or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.

b. Vent local exhaust outside the building and away from building ventilation intakes or ensure system is connected to HEPA filters.

c. Use locally exhausted, power actuated tools or manual hand tools.

3.1.1.8 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Lead Control Area Requirements

Establish a lead control area by completely establishing barriers and physical boundaries around the area or structure where PWL or MCL removal operations will be performed.

Full containment - Contain removal operations by the use of critical barriers and HEPA filtered exhaust or a negative pressure enclosure system with decontamination facilities and with HEPA filtered exhaust if required by the CP. For containment areas larger than 1,000 square feet install a minimum of two 18 inch square viewing ports. Locate ports to provide a view of the required work from the exterior of the enclosed contaminated area. Glaze ports with laminated safety glass.

3.3 APPLICATION

3.3.1 Lead Work

Perform lead work in accordance with approved Lead Compliance Plan. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when the work is performed in accordance with 29 CFR 1926.62 or 40 CFR 745, and as specified herein. Dispose of all PWL or MCL and associated waste in compliance with federal, State, and local requirements.

3.3.2 Paint with Lead or Material Containing Lead Removal

Manual or power sanding or grinding of lead surfaces or materials is not permitted unless tools are equipped with HEPA attachments or wet methods. The dry sanding or grinding of surfaces that contain lead is prohibited. Provide methodology for removing lead in the Lead Compliance Plan. Select lead removal processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris or waste and to ensure that unprotected personnel are not exposed to hazardous concentrations of lead. Describe this removal process in the Lead Compliance Plan.

3.3.2.1 Paint with Lead or Material Containing Lead - Indoor Removal

Perform manual or mechanical removal and thermal cutting in the lead control areas using enclosures, barriers or containments and powered locally exhausted tools. Collect residue debris for disposal in accordance with federal, State, and local requirements.

3.3.2.2 Paint with Lead or Material Containing Lead - Outdoor Removal

Perform outdoor removal as indicated in federal, State, and local regulations and in the Lead Compliance Plan. The worksite preparation (barriers or containments) shall be job dependent and presented in the Lead Compliance Plan.

3.3.3 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn in the control area:

a. Vacuum all clothing before entering the contaminated change room.

b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.

c. Shower or wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing, move to an appropriate shower facility, shower.

d. Change to clean clothes prior to leaving the clean clothes storage area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Conduct sampling for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

a. The CP shall be on the job site directing the air and wipe sampling and inspecting the PWL or MCL removal work to ensure that the requirements of the contract have been satisfied during the entire PWL or MCL operation.

b. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least twenty-five percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

c. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken.

d. Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval.

e. Before any work begins, a third party consultant shall collect and analyze baseline wipe and soil samples in accordance with methods defined by federal, State, and local standards inside and outside of the physical boundary to assess the degree of dust contamination in the facility prior to lead disturbance or removal.

f. Surface Wipe Samples - Collect surface wipe samples on floors at a location no greater than 10 feet outside the lead control area at a frequency of once per day while lead removal work is conducted in occupied buildings. Surface wipe results shall meet criteria in paragraph "Clearance Certification.

3.4.1.2 Sampling After Removal

After the visual inspection, conduct soil sampling if bare soil is present during external removal operations and collect wipe and soil samples according to the HUD protocol contained in HUD 6780 to determine the lead content of settled dust in micrograms per square meter foot of surface area and parts per million (ppm) for soil.

3.4.1.3 Testing of Material Containing Lead Residue

Test residue in accordance with 40 CFR 261 for hazardous waste.

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of dust and debris. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use pressurized air to clean up the area. At the end of each shift and when the lead operation has been completed, clean the controlled area of visible contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the Lead Compliance Plan. Reclean areas showing dust or debris. After visible dust and debris is removed, wet wipe and HEPA vacuum all surfaces in the controlled area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before clearance testing.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the lead control area during paint removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification.

The third party consultant shall certify surface wipe sample results collected inside and outside the work area are less than 200 micrograms per square foot on floors or horizontal surfaces.

Clear the lead control area in industrial facilities of all visible dust and debris.

For exterior work, soil samples taken at the exterior of the work site shall be used to determine if soil lead levels had increased at a statistically significant level (significant at the 95 percent confidence limit) from the soil lead levels prior to the operation. If soil lead levels either show a statistically significant increase above soil lead levels prior to work or soil lead levels above any applicable federal or state standard for lead in soil, the soil shall be remediated.

3.5.2 Disposal

a. All material, whether hazardous or non-hazardous shall be disposed in

accordance with all laws and provisions and all federal, State or local regulations. Ensure all waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

b. Contractor is responsible for segregation of waste. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261.

c. Dispose of lead-contaminated material classified as hazardous waste at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.

d. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. For hazardous waste, the collection drum requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.

e. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

3.5.2.1 Disposal Documentation

Submit written evidence to demonstrate the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA, State or local regulatory agencies. Submit one copy of the completed hazardous waste manifest, signed and dated by the initial transporter in accordance with 40 CFR 262. Contractor shall provide a certificate that the waste was accepted by the disposal facility. Provide turn-in documents or weight tickets for non-hazardous waste disposal.

3.5.2.2 Payment for Hazardous Waste

Payment for disposal of hazardous and non-hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials or non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 02 84 16

HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY
04/06

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.

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

29 CFR 1910.1000	Air Contaminants
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 273	Standards For Universal Waste Management
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 178	Specifications for Packagings

1.2 REQUIREMENTS

Removal and disposal of PCB containing lighting ballasts and associated mercury-containing lamps. Contractor may encounter leaking PCB ballasts.

1.3 DEFINITIONS

1.3.1 Certified Industrial Hygienist (CIH)

A industrial hygienist hired by the contractor shall be certified by the American Board of Industrial Hygiene.

1.3.2 Leak

Leak or leaking means any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

1.3.3 Lamps

Lamp, also referred to as "universal waste lamp", is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

1.3.4 Polychlorinated Biphenyls (PCBs)

PCBs as used in this specification shall mean the same as PCBs, PCB containing lighting ballast, and PCB container, as defined in 40 CFR 761, Section 3, Definitions.

1.3.5 Spill

Spill means both intentional and unintentional spills, leaks, and other uncontrolled discharges when the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases.

1.3.6 Universal Waste

Universal Waste means any of the following hazardous wastes that are managed under the universal waste requirements 40 CFR 273:

(1) Batteries as described in Sec. 273.2 of this chapter;
(2) Pesticides as described in Sec. 273.3 of this chapter;
(3) Thermostats as described in Sec. 273.4 of this chapter; and
(4) Lamps as described in Sec. 273.5 of this chapter.

1.4 QUALITY ASSURANCE

1.4.1 Regulatory Requirements

Perform PCB related work in accordance with 40 CFR 761 and . Perform mercury-containing lamps storage and transport in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, 40 CFR 273 and .

1.4.2 Training

Certified industrial hygienist (CIH) shall instruct and certify the training of all persons involved in the removal of PCB containing lighting ballasts and mercury-containing lamps. The instruction shall include: The dangers of PCB and mercury exposure, decontamination, safe work practices,

and applicable OSHA and EPA regulations. The CIH shall review and approve the PCB and Mercury-Containing Lamp Removal Work Plans.

1.4.3 Regulation Documents

Maintain at all times one copy each at the office and one copy each in view at the job site of 29 CFR 1910.1000, 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 265, 40 CFR 268, 40 CFR 270, 40 CFR 273 and and of the Contractor removal work plan and disposal plan for PCB and for associated mercury-containing lamps.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Qualifications of CIH; G

Training Certification; G

PCB and Lamp Removal Work Plan; G

PCB and Lamp Disposal Plan; G

SD-11 Closeout Submittals

Transporter certification of notification to EPA of their PCB waste activities and EPA ID numbers; G

Certification of Decontamination

Certificate of Disposal and/or recycling. Submit to the Government before application for payment within 30 days of the date that the disposal of the PCB and mercury-containing lamp waste identified on the manifest was completed.

DD Form 1348-1

Testing results

1.6 ENVIRONMENTAL REQUIREMENTS

Use special clothing:

a. Disposable gloves (polyethylene)

b. Eye protection

c. PPE as required by CIH

1.7 SCHEDULING

Notify the Contracting Officer 20 days prior to the start of PCB and mercury-containing lamp removal work.

1.8 QUALITY ASSURANCE

1.8.1 Qualifications of CIH

Submit the name, address, and telephone number of the Industrial Hygienist selected to perform the duties in paragraph entitled "Certified Industrial Hygienist." Submit training certification that the Industrial Hygienist is certified, including certification number and date of certification or re certification.

1.8.2 PCB and Lamp Removal Work Plan

Submit a job-specific plan within 20 calendar days after award of contract of the work procedures to be used in the removal, packaging, and storage of PCB-containing lighting ballasts and associated mercury-containing lamps. Include in the plan: Requirements for Personal Protective Equipment (PPE), spill cleanup procedures and equipment, eating, smoking and restroom procedures. The plan shall be approved and signed by the Certified Industrial Hygienist. Obtain approval of the plan by the Contracting Officer prior to the start of PCB and/or lamp removal work.

1.8.3 PCB and Lamp Disposal Plan

Submit a PCB and lamp Disposal Plan with 45 calendar days after award of contract. The PCB and Lamp Disposal Plan shall comply with applicable requirements of federal, state, and local PCB and Universal waste regulations and address:

a. Estimated quantities of wastes to be generated, disposed of, and recycled.

b. Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location. Furnish two copies of EPA and state PCB and mercury-containing lamp waste permit applications and EPA identification numbers, as required.

c. Names and qualifications (experience and training) of personnel who will be working on-site with PCB and mercury-containing lamp wastes.

d. Spill prevention, containment, and cleanup contingency measures to be implemented.

e. Work plan and schedule for PCB and mercury-containing lamp waste removal, containment, storage, transportation, disposal and or recycling. Wastes shall be cleaned up and containerize daily.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 WORK PROCEDURE

Furnish labor, materials, services, and equipment necessary for the removal of PCB containing lighting ballasts, associated mercury-containing fluorescent lamps, and high intensity discharge (HID) lampsin accordance with local, state, or federal regulations. Do not expose PCBs to open

flames or other high temperature sources since toxic decomposition by-products may be produced. Do not break mercury containing fluorescent lamps or high intensity discharge lamps.

3.1.1 Work Operations

Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with 40 CFR 761, 40 CFR 262 40 CFR 263, and the applicable requirements of this section, including but not limited to:

a. Obtaining suitable PCB and mercury-containing lamp storage sites.

b. Notifying Contracting Officer prior to commencing the operation.

c. Reporting leaks and spills to the Contracting Officer.

d. Cleaning up spills.

e. Inspecting PCB and PCB-contaminated items and waste containers for leaks and forwarding copies of inspection reports to the Contracting Officer.

f. Maintaining inspection, inventory and spill records.

3.2 PCB SPILL CLEANUP REQUIREMENTS

3.2.1 PCB Spills

Immediately report to the Contracting Officer any PCB spills.

3.2.2 PCB Spill Control Area

Rope off an area around the edges of a PCB leak or spill and post a "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to a drip pan or other container.

3.2.3 PCB Spill Cleanup

40 CFR 761, subpart G. Initiate cleanup of spills as soon as possible, but no later than 24 hours of its discovery. Mop up the liquid with rags or other conventional absorbent. The spent absorbent shall be properly contained and disposed of as solid PCB waste.

3.2.4 Records and Certification

Document the cleanup with records of decontamination in accordance with 40 CFR 761, Section 125, Requirements for PCB Spill Cleanup. Provide test results of cleanup and certification of decontamination.

3.3 REMOVAL

3.3.1 Ballasts

As ballast are removed from the lighting fixture, inspect label on ballast. Ballasts without a "No PCB" label shall be assumed to contain PCBs and containerized and disposed of as required under paragraphs STORAGE FOR DISPOSAL and DISPOSAL. If there are less than 1600 "No PCB" labeled lighting ballasts dispose of them as normal demolition debris. If there

are more than 1600 "No PCB" labeled ballasts, establish whether the "No PCB" labeled ballasts contain diethylhexyl phthalate (DEHP) either by test or by checking with the ballast manufacturer indicated on the label. Submit testing results and/or written confirmation from the manufacturer to the Contracting Officer. If the ballasts do not contain DEHP, dispose of them as normal construction debris. If they do contain DEHP, dispose of them as hazardous material in accordance with Federal, State, and local regulations. As a basis of bid assume ballasts with "No PCB" labels do not contain DEHP and may disposed of as normal construction debris. If 1600 or more DEHP ballasts are disposed of in a 24 hour period, notify the National Response Team at 800-424-8802.

3.3.2 Lighting Lamps

Remove lighting tubes/lamps from the lighting fixture and carefully place (unbroken) into appropriate containers (original transport boxes or equivalent). In the event of a lighting tube/lamp breaking, sweep and place waste in double plastic taped bags and dispose of as universal waste as specified herein.

3.4 STORAGE FOR DISPOSAL

3.4.1 Storage Containers for PCBs

49 CFR 178. Store PCB in containers approved by DOT for PCB.

3.4.2 Storage Containers for lamps

Store mercury containing lamps in appropriate DOT containers. The boxes shall be stored and labeled for transport in accordance with 40 CFR 273.

3.4.3 Labeling of Waste Containers

Label with the following:

a. Date the item was placed in storage and the name of the cognizant activity/building.

b. "Caution Contains PCB," conforming to 40 CFR 761, CFR Subpart C. Affix labels to PCB waste containers.

c. Label mercury-containing lamp waste in accordance with 40 CFR 273. Affix labels to all lighting waste containers.

3.5 DISPOSAL

Dispose of off Government property in accordance with EPA, DOT, and local regulations at a permitted site.

3.5.1 Identification Number

Federal regulations 40 CFR 761, and 40 CFR 263 require that generators, transporters, commercial storers, and disposers of PCB waste posses U.S. EPA identification numbers. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Uniform Hazardous Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work. For mercury containing lamp removal, Federal regulations 40 CFR 273 require that large quantity handlers of Universal waste (LQHUW)

must provide notification of universal waste management to the appropriate EPA Region (or state director in authorized states), obtain an EPA identification number, and retain for three years records of off-site shipments of universal waste. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Universal Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work.

3.5.2 Transporter Certification

Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Government. Return a signed copy to the Government before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities (EPA Form 7710-53).

3.5.2.1 Certificate of Disposal and/or Recycling

40 CFR 761. Certificate for the PCBs and PCB items disposed shall include:

a. The identity of the disposal and or recycling facility, by name, address, and EPA identification number.

b. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

c. A statement certifying the fact of disposal and or recycling of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

d. A certification as defined in 40 CFR 761.

3.5.3 Disposal by the Government

Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Load and haul PCBs to the storage site operated by the Defense Reutilization and marketing Officer (DRMO). If the primary site is filled to capacity, contact the Contracting Officer. The transport distance to any storage site will not exceed the distance between the project site and the DRMO storage site on base.

3.5.3.1 Delivery

Contact DRMO at least 5 working days in advance to make arrangements for delivery of PCB to the storage site.

3.5.3.2 DD Form 1348-1

Prepare DD Form 1348-1 Turn-in Document (TID), which will accompany the PCB to the storage site. Ensure that a responsible person from the activity that owns the PCB signs the DD Form 1348-1.

-- End of Section --

SECTION 02 84 33

REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs)
04/06

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.

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

29 CFR 1910.1000	Air Contaminants
29 CFR 1910.145	Accident Prevention Signs and Tags
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 174	Carriage by Rail
49 CFR 175	Carriage by Aircraft
49 CFR 176	Carriage by Vessel
49 CFR 177	Carriage by Public Highway
49 CFR 178	Specifications for Packagings
49 CFR 179	Specifications for Tank Cars

1.2 REQUIREMENTS

The work includes the removal and disposal of PCB's. Perform work in accordance with 40 CFR 761 and the requirements specified herein.

1.3 DEFINITIONS

1.3.1 Leak

Leak or leaking means any instance in which a PCB Article, PCB Container, or PCB Equipment has any PCBs on any portion of its external surface.

1.3.2 PCBs

PCBs as used in this specification shall mean the same as PCBs, PCB Article, PCB Article Container, PCB Container, PCB Equipment, PCB Item, PCB Transformer, PCB-Contaminated Electrical Equipment, as defined in 40 CFR 761, Section 3, Definitions.

1.3.3 Spill

Spill means both intentional and unintentional spills, leaks, and other uncontrolled discharges when the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases.

1.4 QUALITY ASSURANCE

1.4.1 Training

Instruct employees on the dangers of PCB exposure, on respirator use, decontamination, and applicable OSHA and EPA regulations.

1.4.2 Certified Industrial Hygienist (CIH)

Obtain the services of an industrial hygienist certified by the American Board of Industrial Hygiene to certify training, review and approve the PCB removal plan, including determination of the need for personnel protective equipment (PPE) in performing PCB removal work.

1.4.3 Regulation Documents

Maintain at all times one copy each at the office and one copy each in view at the job site 29 CFR 1910.1000, 40 CFR 761, and Contractor work practices for removal, storage and disposal of PCBs.

1.4.4 Surveillance Personnel

Surveillance personnel may enter PCB control areas for brief periods of time provided they wear disposable polyethylene gloves and disposal polyethylene foot covers, as a minimum. Additional protective equipment may be required if respiratory hazard is involved or if skin contact with PCB is involved.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Training certification

Qualifications of CIH

PCB removal work plan

PCB disposal plan

Notification

Transporter certification of notification to EPA of their PCB waste activities and EPA ID numbers

Certification of Decontamination for PCB Spill

Post cleanup sampling data

Certificate of disposal

1.6 EQUIPMENT

1.6.1 Special Clothing

Work clothes shall consist of PPE as required by OSHA regulations, including, but not limited to the following:

a. Disposable coveralls

b. Gloves (Disposable rubber gloves may be worn under these)

c. Disposable foot covers (polyethylene)

d. Chemical safety goggles

e. Half mask cartridge respirator.

1.6.2 Special Clothing for Government Personnel

Provide PPE specified in paragraph entitled "Special Clothing" to the Contracting Officer as required for inspection of the work.

1.6.3 PCB Spill Kit

Assemble a spill kit to include the following items:

ITEM	MINIMUM QUANTITY
1. Disposable gloves (polyethylene)	6 prs
2. Gloves with a high degree of impermeability to PCB	6 prs
3. Disposable coveralls with permeation resistance to PCB	4 ea
4. Chemical safety goggles	2 ea
5. Disposable foot covers (polyethylene)	6 prs
6. PCB Caution Sign: "PCB Spill--Authorized Personnel Only"	2 ea

7. Banner guard or equivalent banner material	100 feet
8. Absorbent material	
9. Blue polyethylene waste bags	5 bags
10. Cloth backed tape	5 ea
11. Area access logs, blank	1 roll
12. Brattice cloth, 6' x 6'	10 ea
13. Rags	1 piece
14. Ball point pens	20 ea
15. Herculite, 4' x 4' and 8' x 8'	2 ea and 1 ea
16. Blank metal signs and grease pencils	
17. Waste containers 55 gallon drum, may be used as container for kit	2 ea ea

1.7 QUALITY ASSURANCE

1.7.1 Training Certification

Submit certificates, prior to the start of work but after the main abatement submittals, signed and dated by the CIH and by each employee stating that the employee has received training. Certificates shall be organized by individual worker, not grouped by type of certificates.

1.7.2 Qualifications of CIH

Submit the name, address, and telephone number of the Industrial Hygienist selected to perform the duties in paragraph entitled "Certified Industrial Hygienist." Submit proper documentation that the Industrial Hygienist is certified, including certification number and date of certification/recertification.

1.7.3 PCB Removal Work Plan

Submit a detailed job-specific plan of the work procedures to be used in the removal of PCB-containing materials, not to be combined with other hazardous abatement plans. Provide a Table of Contents for each abatement submittal which shall follow the sequence of requirements in the contract. The plan shall include a sketch showing the location, size, and details of PCB control areas, location and details of decontamination rooms, change rooms, shower facilities, and mechanical ventilation system. Include in the plan, eating, drinking, smoking and restroom procedures, interface of trades, sequencing of PCB related work, PCB disposal plan, respirators, protective equipment, and a detailed description of the method of containment of the operation to ensure that PCB contamination is not spread or carried outside of the control area. Include provisions to ensure that airborne PCB concentrations of 3.10 E-08 pound per cubic feet of air are not exceeded outside of the PCB control area. Include air sampling,

training and strategy, sampling methodology, frequency, duration of sampling, and qualifications of air monitoring personnel in the air sampling portion of the plan. Obtain approval of the plan prior to the start of PCB removal work.

1.7.4 PCB Disposal Plan

Submit a PCB Disposal Plan within 45 calendar days after award of contract for Contracting Officer's approval. The PCB Disposal Plan shall comply with applicable requirements of Federal, State, and local PCB waste regulations and address:

a. Identification of PCB wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of EPA State and local PCB waste permit applications, permits and EPA Identification numbers.

d. Names and qualifications (experience and training) of personnel who will be working on-site with PCB wastes.

e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures to be implemented.

g. Work plan and schedule for PCB waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily.

1.7.5 Notification

Notify the Contracting Officer 20 days prior to the start of PCB removal work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Decontamination Room, Clean Room and Shower Facilities

a. Provide material and labor for construction of a decontamination room, a clean room, and shower facilities. Provide rooms with doors and attach to the exit ways of PCB work areas. Rooms shall be of sufficient size to accommodate the Contractor's operation within. Provide portable toilet and shower facilities. Locate shower facilities between the clean room and decontamination room. Provide separate clothing lockers or containers in each room to prevent contamination of street and work clothes.

b. Remove PCB-contaminated PPE in the decontamination room. Workers shall

then proceed to showers. Workers shall shower before lunch and at the end of each day's work. Hot water, towels, soap, and hygienic conditions are the responsibility of the Contractor.

3.1.2 PCB Control Area

Isolate PCB control area by physical boundaries to prevent unauthorized entry of personnel. Food, drink and smoking materials shall not be permitted in areas where PCBs are handled or PCB items are stored.

3.1.3 Personnel Protection

Workers shall wear and use PPE, as recommended by the Industrial Hygienist, upon entering a PCB control area. If PPE is not required per the CIH, specify in the PCB removal work plan.

3.1.4 Footwear

Work footwear shall remain inside work area until completion of the job.

3.1.5 Permissible Exposure Limits (PEL)

PEL for PCBs is 3.1 E-08 lb/cubic foot on an 8-hour time weighted average basis.

3.1.6 Special Hazards

a. PCBs shall not be exposed to open flames or other high temperature sources since toxic decomposition by-products may be produced.

b. PCBs shall not be heated to temperatures of 135 degrees F or higher without Contracting Officer's concurrence.

3.1.7 PCB Caution Label

40 CFR 761, Subpart C. Affix labels to PCB waste containers and other PCB-contaminated items. Provide label with sufficient print size to be clearly legible, with bold print on a contrasting background, displaying the following: CAUTION: Contains PCBs (Polychlorinated Biphenyls).

3.1.8 PCB Caution Sign

29 CFR 1910.145. Provide signs at approaches to PCB control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area.

3.2 WORK PROCEDURE

Furnish labor, materials, services, and equipment necessary for the complete removal of PCBs located at the site as indicated or specified in accordance with local, State, or Federal regulations. Package and mark PCB as required by EPA and DOT regulations and dispose of off Government property in accordance with EPA, DOT, and local regulations at a permitted site.

3.2.1 No Smoking

Smoking is not permitted within 50 feet of the PCB control area. Provide "No Smoking" signs as directed by the Contracting Officer.

3.2.2 Work Operations

Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with 40 CFR 761 and the applicable requirements of this section, including but not limited to:

a. Obtaining advance approval of PCB storage sites.

b. Notifying Contracting Officer prior to commencing the operation.

c. Reporting leaks and spills to the Contracting Officer.

d. Cleaning up spills.

e. Maintaining an access log of employees working in a PCB control area and providing a copy to the Contracting Officer upon completion of the operation.

f. Inspecting PCB and PCB-contaminated items and waste containers for leaks and forwarding copies of inspection reports to the Contracting Officer.

g. Maintaining a spill kit as specified in paragraph entitled "PCB Spill Kit."

h. Maintaining inspection, inventory and spill records.

3.3 PCB TRANSFORMERS

3.3.1 Draining of Transformer Liquid

Perform work in accordance with 49 CFR 171, 49 CFR 172, 49 CFR 173, 49 CFR 174, 49 CFR 175, 49 CFR 176, 49 CFR 177, 49 CFR 178, and 49 CFR 179, Subchapter C and as specified herein. Drain the transformer, switches, and regulators of free flowing liquid prior to transportation. Place the drained liquids in DOT Spec 17E drums. The drums shall not contain more than 50 gallons of oil. If the equipment cannot be drained, then place it in DOT Spec 17C drums.

3.3.2 Markings

Provide drums and drained PCB-contaminated electrical equipment with caution label markings as specified in paragraph entitled "PCB Caution Label."

3.3.3 Laboratory Analysis

All transformers shall have a laboratory analysis for turn-in. DRMO-Hawaii prefers a gas chromotograph test. The only two exceptions to this rule are:

a. The transformer is hermetically sealed (solder sealed or fusion sealed. No access ports or openings).

b. The name plate states that the transformer contains pyranol, interteen, etc.

Attach a copy of the lab analysis to both the DD 1348-1 and the transformer itself.

3.3.4 Markings

3.3.4.1 Transformers, Less Than 50 ppm

Add absorbent material to absorb residue oil remaining after draining. Write the date drained on the transformer. Turn in transformers to the DRMO Scrapyard. Telephone 471-3636 to schedule appointment for turn-in.

3.3.4.2 Transformers, 50-499 ppm

Same procedure as transformers in the less than 50 ppm range.

3.3.4.3 Transformers, Greater Than 500 ppm

Stencil date drained on the transformer. Turn in transformer to DRMO-Hawaii, Building #26, Manana Storage Area.

3.3.4.4 Drums

Stencil on DOT-approved 55 gallon drums containing PCB liquid the following:

a. ppm

b. Date drum filled

c. Serial number of transformer liquid came from

d. National Stock Number

(1) "9999-00-OIL" for <50 ppm

(2) "9999-00-CONPCB" for 50-499 ppm

(3) "9999-00-PCBOIL" for >500 ppm

Do not mix different ppms in the same drum. Drums must have a 2 inch ullage space from the top of the drum.

3.4 PCB REMOVAL

Select PCB removal procedure to minimize contamination of work areas with PCB or other PCB-contaminated debris/waste. Handle PCBs such that no skin contact occurs. PCB removal process should be described in the work plan.

3.4.1 Confined Spaces

As feasible, do not carry out PCB handling operations in confined spaces. A confined space shall mean a space having limited means of egress and inadequate cross ventilation.

3.4.2 Control Area

Establish a PCB control area around the PCB item as specified in paragraph entitled "PCB Control Area." Only personnel briefed on the elements in the paragraph entitled "Training" and on the handling precautions shall be allowed into the area.

3.4.3 Exhaust Ventilation

If used, exhaust ventilation for PCB operations shall discharge to the outside and away from personnel.

3.4.4 Temperatures

As feasible, handle PCBs at ambient temperatures and not at elevated temperatures.

3.4.5 Solvent Cleaning

Clean contaminated tools, containers, etc., after use by rinsing three times with an appropriate solvent or by wiping down three times with a solvent wetted rag. Suggested solvents are stoddard solvent or hexane.

3.4.6 Drip Pans

Drip pans are required under portable PCB transformers and rectifiers in use or stored for use. The pans shall have a containment volume of at least one and one-half times the internal volume of PCBs in the item.

3.4.7 Evacuation Procedures

Procedures shall be written for evacuation of injured workers. Aid for a seriously injured worker shall not be delayed for reasons of decontamination.

3.5 PCB SPILL CLEANUP REQUIREMENTS

3.5.1 PCB Spills

Immediately report to the Contracting Officer any PCB spills on the ground or in the water, PCB spills in drip pans, or PCB leaks.

3.5.2 PCB Spill Control Area

Rope off an area around the edges of a PCB leak or spill and post a "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to a drip pan or other container.

3.5.3 PCB Spill Cleanup

40 CFR 761, Subpart G. Initiate cleanup of spills as soon as possible, but no later than 48 hours of its discovery. To clean up spills, personnel shall wear the PPE prescribed in paragraph entitled "Special Clothing" of this section. If misting, elevated temperatures or open flames are present, or if the spill is situated in a confined space, notify the Contracting Officer. Mop up the liquid with rags or other conventional absorbent. The spent absorbent shall be properly contained and disposed of as solid PCB waste.

3.5.4 Records and Certification

Document the cleanup with records of decontamination in accordance with 40 CFR 761, Section 125, Requirements for PCB Spill Cleanup. Provide certification of decontamination.

3.5.5 Sampling Requirements

Perform post cleanup sampling as required by 40 CFR 761, Section 130, Sampling Requirements. Do not remove boundaries of the PCB control area until site is determined satisfactorily clean by the Contracting Officer.

3.6 STORAGE FOR DISPOSAL

3.6.1 Storage Containers for PCBs

49 CFR 178. Store liquid PCBs in Department of Transportation (DOT) Specification 17E containers. Store nonliquid PCB mixtures, articles, or equipment in DOT Specification 5, 5B, or 17C containers with removable heads.

3.6.2 Waste Containers

Label with the following:

a. "Solid (or Liquid) Waste Polychlorinated Biphenyls"

b. The PCB Caution Label, paragraph entitled "PCB Caution Label"

c. The date the item was placed in storage and the name of the cognizant activity/building.

3.6.3 PCB Articles and PCB-Contaminated Items

Label with items b. through c. above.

3.6.4 Approval of Storage Site

Obtain in advance Contracting Officer approval using the following criteria without exception.

a. Adequate roof and walls to prevent rainwater from reaching the stored PCBs.

b. An adequate floor which has continuous curbing with a minimum 6 inch high curb. Such floor and curbing shall provide a containment volume equal to at least two times the internal volume of the largest PCB article or PCB container stored therein or 25 percent of the total internal volume of all PCB equipment or containers stored therein, whichever is greater.

c. No drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area.

d. Floors and curbing constructed of continuous smooth and impervious materials such as portland cement, concrete or steel to prevent or minimize penetrations of PCBs.

e. Not located at a site which is below the 100-year flood water elevation.

f. Each storage site shall be posted with the PCB Caution Sign, paragraph entitled "PCB Caution Sign."

3.7 CLEANUP

Maintain surfaces of the PCB control area free of accumulations of PCBs. Restrict the spread of dust and debris; keep waste from being distributed over work area.

Do not remove the PCB control area and warning signs prior to the Contracting Officer's approval. Reclean areas showing residual PCBs.

3.8 DISPOSAL

Comply with disposal requirements and procedures outlined in 40 CFR 761. Do not accept PCB waste unless it is accompanied by a manifest signed by the Government. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Government. Return a signed copy to the Government before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities.

3.8.1 Certificate of Disposal

40 CFR 761. Submit to the Government within 30 days of the date that the disposal of the PCB waste identified on the manifest was completed. Certificate for the PCBs and PCB items disposed shall include:

a. The identity of the disposal facility, by name, address, and EPA identification number.

b. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

c. A statement certifying the fact of disposal of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

d. A certification as defined in 40 CFR 761, Section 3.

3.8.1.1 Payment Upon Furnishing Certificate of Disposal of PCBs

Payment will not be made until the certificate of disposal has been furnished to the Contracting Officer.

3.8.2 Disposal by the Government

Load and haul PCBs to the storage site operated by the Defense Reutilization and Marketing Office (DRMO). If the primary site is filled to capacity, contact the Public Works Center Hazardous Waste Branch Environmental Engineer to determine an alternate storage site. The transport distance to any storage site shall not exceed the distance between the project site and the DRMO storage site.

3.8.2.1 Delivery

3.8.2.2 DD Form 1348-1

Prepare DD Form 1348-1 Turn-in Document (TID), which will accompany the

PCBs to the storage site. Ensure that a responsible person from the activity that owns the PCBs signs the DD Form 1348-1.

3.8.2.3 Payment Upon Furnishing DD Form 1348-1

Payment will not be made until a completed DD Form 1348-1 has been furnished to the Contracting Officer.

-- End of Section --

SECTION 02 85 00.00 20

MOLD REMEDIATION
05/11

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 INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA IMOM08-679	(2008) Recognition, Evaluation, and Control of Indoor Mold

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE Z9.2	(2012) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

INSTITUTE OF INSPECTION, CLEANING, AND RESTORATION CERTIFICATION (IICRC)

IICRC S100	(2002) Standard Reference Guide for Professional Carpet Cleaning
IICRC S500	(2006) Standard and Reference Guide for Professional Water Damage Restoration

NATIONAL AIR DUCT CLEANERS ASSOCIATION (NADCA)

ACR	(2013) Standard for Assessment, Cleaning, and Restoration of HVAC Systems

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

29 CFR 1910.134	Respiratory Protection
29 CFR 1926.1101	Asbestos

UNDERWRITERS LABORATORIES (UL)

UL 586	(2009) Standard for High-Efficiency Particulate, Air Filter Units

1.2 DEFINITIONS 1.2.1

AIHA

American Industrial Hygiene Association.

1.2.2 AFU

Air filtration unit with High Efficiency particulate air (HEPA) filtered vacuum and / or exhaust ventilation equipment with a filter system capable of collecting and retaining microbial contamination ASSE Z9.2. Filters shall retain 99.97 percent of particles 1.2 by 10-6 inch or larger as indicated in UL 586.

1.2.3 Categories of Water

(IICRC S500) Category 1 Water: Water originating from a source that does not pose substantial harm to humans. Also referred to as "clean water."

Category 2 Water: Water containing a significant degree of chemical, biological and/or physical contamination and having the potential to cause discomfort or sickness if consumed by or exposed to humans. Also referred to as "gray water."

Category 3 Water: Grossly unsanitary water, containing pathogenic agents, arising from sewage or other contaminated water sources and having the likelihood of causing discomfort or sickness if consumed by or exposed to humans. This category includes all forms of seawater, ground surface water and rising water from rivers or streams. Also referred to as "black water."

1.2.4 Certified Industrial Hygienist (CIH)

A Certified Industrial Hygienist refers to an individual that has been certified by the American Board of Industrial Hygiene (ABIH), with professional qualifications and experience as required for an industrial hygienist, as presented in the definition of "Industrial Hygienist."

1.2.5 Complete Interior Building Demolition (Complete Gut)

Interior finishes of the building have been removed to expose basic structural elements.

1.2.6 Containment

Physical separation and engineering controls required to prevent contamination of undamaged materials and occupied areas. The level of containment varies depending on the extent of the contamination.

1.2.6.1 Source Containment

Use when the contaminated surface area is less than 10 square feet, in non-residential buildings only. At a minimum, source containment shall include the following:

a. Isolation of Work Areas. Install polyethylene barriers to isolate the areas or material to be demolished / remediated from non-remediation areas.

b. Floor protection. Maintain protection for finished floors through all construction activities.

c. HEPA vacuum to control dust created during the demolition. Hold HEPA vac intake at source of dust.

1.2.6.2 Limited Containment

Use when contaminated surface area is between 10 square feet and 100 square feet per room in non-residential buildings and contaminated surface area less than 100 square feet per room in residential buildings. At a minimum, limited containment shall include the following:

a. Containment. For residential buildings, a containment shall include the entire room where work is being performed. The containment shall not extend past the extents of the room unless there are instances of contamination extending from one room to the next. For non-residential buildings, the containment shall include the area to be remediated, plus enough additional area to allow for all equipment and work activities.

b. Isolation of Work Areas. Install polyethylene barriers to isolate the areas to be demolished / remediated.

c. Floor protection. Maintain protection for finished floors through all construction activities.

d. Air Filtration / Pressurization Control. Install AFUs with HEPA filters in the containment. Configure the AFUs with splitters / diverters to allow some of the air to recirculate within the containment. Discharge the remainder of the air directly to the outside to maintain an overall negative pressure in the containment of 0.02 inch water column minimum to 0.04 inch water column maximum relative to the outside and other adjacent spaces not undergoing remediation. AFUs shall filter a minimum of four air changes per hour and a maximum of six air changes per hour.

e. Protection for all items remaining in the containment. Protective devices shall prevent physical damage (e.g., scratches and dents) and shall provide a positive seal to prevent dust from settling in or on the items.

f. Containment Entrance. Install a triple-flap poly "door" to be used during demolition to minimize egress and provide a good separation between containment and occupied areas of the house / building.

1.2.6.3 Full Containment

Use when contaminated surface area is greater than 100 square feet in both residential and nonresidential buildings. At a minimum, full containment shall include the following:

a. Containment. For residential buildings, a containment shall include the entire room where work is being performed. The containment shall not extend past the extents of the room unless there are instances of contamination extending from one room to the next. For non-residential buildings, the containment shall include the area to be remediated, plus enough additional area to allow for all equipment and work activities.

b. Isolation of Work Areas. Construct polyethylene barriers to isolate the areas to be demolished / remediated.

c. Floor protection. Maintain protection for finished floors through all construction activities.

d. Air Filtration / Pressurization Control. Install AFUs with HEPA filters in the containment. Configure the AFUs with splitters / diverters to allow some of the air to recirculate within the containment. Discharge the remainder of the air directly to the outside to maintain an overall negative pressure in the containment of 0.02 inch water column minimum to 0.04 inch water column maximum relative to the outside and other adjacent spaces not undergoing remediation. AFUs shall filter a minimum of four air changes per hour and a maximum of six air changes per hour.

e. Protection for all items remaining in the containment. Protective devices shall prevent physical damage (e.g., scratches and dents) and shall provide a positive seal to prevent dust from settling in or on the items.

f. Decontamination. Construct a decontamination airlock for entry into and exit from the work area. The airlock shall be used to HEPA vacuum the sealed bags of contaminated debris. When possible, the decontamination airlock shall be located so that the sealed bags can be passed directly from the airlock to the outside, through a door or window.

g. Containment Entrance. Install a triple-flap poly "door" at the entrance to the airlock, and between the airlock and the work area during demolition to minimize egress and provide a good separation between containment and occupied areas of the house / building.

1.2.6.4 Unoccupied Building Containment

Use when a building is unoccupied and large amounts of mold growth are present throughout the building:

a. Containment. The containment consists of the entire building. Install AFUs with HEPA filters in the building. Configure the AFUs to recirculate within the active remediation area. AFUs shall filter a minimum of four air changes per hour and a maximum of six air changes per hour based on the size of the area undergoing active remediation.

b. Isolation of Work Areas. Install polyethylene barriers to isolate the areas where remediation is not required. AFU discharge may be used to positively pressurize non-remediation areas from areas undergoing remediation to prevent the movement of spores into "clean" areas.

c. Floor Protection. Maintain protection for finished floors through all construction activities.

d. Protection for all items remaining in the containment. Protective devices shall prevent physical damage (e.g., scratches and dents) and shall provide a positive seal to prevent dust from settling in or on the items.

e. Decontamination. Construct a decontamination airlock for entry into and exit from the building.

f. Containment Entrance. A triple-flap poly "door" shall be used at the entrance to the work area during demolition to minimize egress.

1.2.6.5 Cleaning Containment

A temporary containment structure set up to clean items removed from the containment. At a minimum, the cleaning area shall contain:

a. Two chambers. Construct walls with polyethylene. Items will be cleaned in the first chamber. The clean items shall be stored in the second chamber.

b. Air Filtration / Pressurization Control Cleaning Chamber. Install AFUs with HEPA filters in the cleaning chamber. Configure the AFUs with splitters / diverters to allow some of the air to recirculate within the containment. Discharge the remainder of the air directly to the outside to maintain an overall negative pressure in the containment of 0.02 inch water column minimum to 0.04 inch water column (maximum) relative to the storage chamber.

c. Air Filtration, Storage Chamber. Install AFUs with HEPA filters in the storage chamber. The AFUs shall be configured to allow air to recirculate within the chamber. AFUs shall filter a minimum of four air changes per hour and a maximum of six air changes per hour.

d. Containment Entrance. Install a triple-flap poly "door" at the entrance to the cleaning chamber, between the cleaning and storage chambers, and at the exit of the storage chamber to minimize egress and provide a good separation between the chambers.

1.2.7 Decontamination Unit (Airlock)

An enclosed area adjacent to, and connected to, a regulated work area. It consists of various rooms that are used for the decontamination of workers, equipment, and materials.

1.2.8 Dehumidifier

Mechanism or machine to remove moisture from the air.

1.2.9 Detergent

A cleaning agent. The term refers to a prepared compound that may include surfactants, builders, dry solvents, softeners, etc, but does not include true soap.

1.2.10 Disinfectants or Biocide Sanitizing Solutions

One of three groups of antimicrobials registered by the EPA for public health uses. The EPA considers an antimicrobial to be a disinfectant when it destroys or irreversibly inactivates infectious or other undesirable organisms, but not necessarily their spores.

1.2.11 EPA

U.S. Environmental Protection Agency.

1.2.12 Fungicidal Agents, (EPA)

A coating material that contains an EPA registered fungicide that inhibits the spread and growth of mold with the ability to withstand moist and humid conditions.

1.2.13 HEPA Filter

A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97 percent of all particulate larger than 1.2 by 10-6 inch.

1.2.14 HVAC

Heating, Ventilating, and Air Conditioning (System).

1.2.15 Industrial Hygienist (IH)

Industrial Hygienist (IH) refers to an individual designated and provided by the Contractor that is a professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational and indoor air quality hazards. Education must include a minimum 12 semester hours or quarter hour equivalent of chemistry and 18 additional semester hours or quarter hour equivalent of courses in any combination of chemistry, physics, engineering, health physics, environmental health, biostatistics, biology, physiology, toxicology, epidemiology, or industrial hygiene. The Industrial Hygienist shall be under the supervision of a Certified Industrial Hygienist.

1.2.16 Microbial Remediation Supervisor

Individual responsible for the execution of the microbial remediation work as defined by the scope of work. This individual shall have documented training in microbial remediation and have at least three years experience in microbial remediation work. Remediation contractor's on-site supervisor shall have one of the following certifications: Council-Certified Mold Remediator (CMR), or Council-Certified Mold Remediation Supervisor (CMRS) as certified by the American Council for Accredited Certification, or Applied Microbial Remediation Specialist (AMRS), Institute of Inspection, Cleaning, and Restoration Certification (IICRC) or Contracting Officer approved equivalent.

1.2.17 Non-Porous Material

A material that does not absorb nor is easily penetrated by liquids, especially water. Generally, non-porous materials have a permeable factor of less than 1. Some examples are metal, glass, plastic, ceramic tile, etc.

1.2.18 Occupied Spaces (Areas)

The phrase "occupied space" within this specification refers to spaces that are occupied by unprotected non-remediation personnel while work is in progress. It also refers to areas adjacent to work areas that are not currently undergoing remediation.

1.2.19 Personal Protective Equipment (PPE)

Any material or device worn to protect a worker from exposure to, or contact with, any harmful material or force. PPE must be cleaned or disposed of prior to removal from the remediation work area.

1.2.20 Poly

Polyethylene sheet with a minimum thickness of 6 mils.

1.2.21 Porous Material

Permeable materials having the physical properties that allow liquids or gasses to pass through. These materials include but are not limited to the following: gypsum wall board, insulation, wallpaper, ceiling material, carpet, padding, paper goods (i.e., cardboard boxes, loose paper, books, etc.), stuffed furniture, wicker, fabrics, etc.

1.2.22 Pressure Differential Measuring Instrument

Device used to measure the relative pressure difference between the work area and areas outside the work area. For mold remediation, the device must measure accurately in the 0 to 0.04 inch range.

1.2.23 Semi-porous Material

A material that can absorb liquids if exposed over long periods of time. These materials include but are not limited to wood, concrete, linoleum, vinyl wall covering, wooden or hardboard furniture, plaster, etc.

1.2.24 Ventilation System Mold Remediator Qualifications (VSMR)

An individual certified by the North American Duct Cleaning Association (NADCA) to clean HVAC systems.

1.2.25 Work Area

The area where remediation operations are actively performed and controlled to prevent the spread of dust / spores and entry by unauthorized personnel. A work area is the space, group of spaces, or the building, as defined by the Microbial Assessment Survey.

1.3 REQUIREMENTS

1.3.1 Description of Work

The Contracting Officer will furnish the Contractor, in the contract documents, an initial Microbial Assessment Survey with containment categories and remediation methods specified for each work area and material within the work area.

The Contracting Officer's initial Microbial Assessment Survey specified below shall be furnished and certified by a qualified assessor authorized by the Contracting Officer to do such work. The initial survey is included in the solicitation documents at the end of this specification section.

Provide mold remediation work including the handling and control of mold contaminated materials and the resultant procedures and equipment required to protect workers, the environment and occupants of the building or area, or both, from contact with mold products and spores. The work also includes the disposal of any mold contaminated materials generated by the work. The mold removal work includes the demolition and removal of mold contaminated materials as indicated in each task order. Provide containment and

engineering control techniques as outlined in this specification. All mold contaminated material removal work shall be supervised by a microbial remediation supervisor as specified herein.

No work in this specification section shall be provided by any person, contractor, or contracting entity involved in the preparation of the contract documents of which this specification section is a part.

The following microbial remediation specifications apply to the cleaning / removal and disposal of fungally-contaminated porous, semi-porous and non-porous surfaces within various types of structures. The level of containment and requirements for cleaning and remediation of materials will depend on the condition of the space and materials being remediated.

Immediately after award of the contract, prepare a preliminary visual assessment report using the standard microbial assessment form (Appendix A) to document the differences in the pre-remediation condition of the work areas as compared to the government provided Microbial Assessment Survey. Only address the differences between the pre-remediation condition of the work areas and the government provided Microbial Assessment Survey. If required to indicate the differences, include the HVAC systems inspection required elsewhere in this specification section. Submit this written pre-remediation condition report to the Contracting Officer for approval and instructions to proceed.

After approval of the preliminary visual assessment report and having instructions from the Contracting Officer to proceed, prepare a microbial remediation plan for approval by the Contractor's Certified Industrial Hygienist. Microbial remediation plan shall include an assessment of the risk for people to occupy areas adjoining the remediation area while remediation work is occurring. Upon the Contractor's CIH approval of the plan, submit the plan to the Contracting Officer for approval.

The Contractor's CIH or IH shall monitor the site on a daily basis while remediation work is in progress, identifying work and/or work practices that are not in compliance with the approved microbial remediation plan, and performing all inspections required by this specification. The Contracting Officer may require the removal of any individual for non-compliance with quality requirements specified in the contract.

This specification section includes the protocol regarding proper disposal of the removed building material components from within the work site.

Use proper cleaning procedures, engineering controls, and apply best management practices to remove microbial growth and spore fallout from all surfaces and building materials to minimize the further release of microbial spores. Address semi-porous and nonporous surfaces within the facility in each cleaning phase of the project. Damp wipe and HEPA vacuum all surfaces, at a minimum. Remove and dispose of porous building materials that are supporting microbial growth.

1.3.2 Security Requirements

Prior to granting access to any work area (i.e., building, area, room, or space) for mold remediation work, a determination must be made by the government agency whether classified or controlled unclassified information (paper material and / or electronic media) or equipment is contained in the

work area(s).

If Contractor personnel require access to classified information or spaces to perform mold remediation work, the Government must issue the Contractor facility a DD Form 254 (Contract Security Classification Specification) prior to the initiation of the work under the contract. If the Contractor facility does not possess a valid DD Form 254 issued by the Defense Security Service (DSS), the Government will be required to submit a sponsorship request to DSS requesting that the Contractor be processed for and issued a current DD Form 254 at the appropriate level.

Access to classified information (paper material, electronic media, and equipment) must only be granted to authorized and appropriately cleared government and U.S. contractor personnel that possess a personnel security clearance commensurate with the level of information contained in the work area that requires a mold remediation effort.

Access to Controlled Unclassified information (i.e., For Official Use Only, Sensitive but Unclassified, Privacy Act Information, Export Controlled unclassified, etc.) can be granted to DOD cleared contractors, consultants and grantees that are conducting official business for the DOD or DON. Non-cleared U.S. contractor personnel who only require access to controlled unclassified information can be granted access if they get a favorable trustworthiness determination on an individual Facility Access Determination National Agency Check (FADNAC) submitted on their behalf by the government agency issuing the contract.

Classified information and controlled unclassified information must be safeguarded / secured, reproduced, and destroyed in accordance with SECNAV M-5510.36.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preliminary Visual Assessment Report; G

Microbial Remediation Plan; G

Worker Records;

Respiratory Protection Program; G

Certified Industrial Hygienist (CIH)/Industrial Hygienist (IH) Qualifications; G

Microbial Remediation Supervisor Qualifications; G

Ventilation System Mold Remediator Qualifications (VSMR); G

SD-03 Product Data

Personal Protective Equipment (PPE); G

Air Filtration Units;

Dehumidifiers;

Pressure Differential Measuring Instrument;

Fungicidal Agents, (EPA); G

Disinfectants or Biocide Sanitizing Solutions; G

SD-06 Test Reports

Daily Reports; G

SD-11 Closeout Submittals

Submittals at Completion of Remediation Work; G

1.4.1 Preconstruction Submittals

Within ten (10) days from the award of the contract and prior to the start of the work, submit to the Contracting Officer six copies of the following items for review and permanent file.

1.4.1.1 Preliminary Visual Assessment Report

A written report to document the pre-remediation condition of the work areas compared to the government provided Microbial Assessment Survey and the results of the HVAC systems inspection.

1.4.1.2 Microbial Remediation Plan

Submit a job-specific, detailed plan Approved by the Contractor's CIH to the Contracting Officer for final approval prior to start of work. The plan shall address the following items at a minimum:

a. Description of materials to be remediated, providing location and quantities (map if available), and methods to be used for remediation.

b. Types of biocides and fungicidal agents, (EPA).

c. Containment procedures to include description and locations of engineering controls and decontamination unit to include entry and exit procedures (provide sketch of floor plan showing location of containment barriers and decontamination units). Plan shall include locations of AFUs and AFU discharges to the outside.

d. Description of personal protective equipment to be used during the remediation.

e. Construction barricades and barriers in occupied areas.

f. HVAC Shut down and start-up procedures.

g. HVAC Evaluation and remediation procedures.

h. Moisture and relative humidity control procedures and equipment.

i. Packaging and disposal procedures.

j. Safety Precautions to include lockout / tag-out, fall protection, confined space entry procedures, and fire protection.

k. Description of the method to be employed to control cross contamination of areas not in the work area. This shall include a risk assessment related to the suitability of people to occupy areas adjoin the remediation area while remediation activities are ongoing.

l. IH Quality Control procedures to include visual inspection.

m. Procedures to control, abate, and dispose of Asbestos Containing Materials (ACM) and Lead Based Paint (LBP) coincident with microbial remediation. Before work in areas containing ACM and PACM is begun; Contractor shall identify the presence, location, and quantity of ACM, and/or PACM therein pursuant to paragraph (k)(1) of 29 CFR 1926.1101.

1.4.1.3 Respiratory Protection Program

Provide written copy of Contractor's Respiratory Protection program.

1.4.1.4 Worker Records

Provide the following documents for all workers, including supervisory personnel. If new workers are added to the crew, provide the same documentation for them.

Employee Instruction and Release Form: Provide documentation showing that each employee has been instructed on the following items:

a. Use and fit of respirators (for employees entering and working in the containment).

b. Protective clothing.

c. Protective measures.

d. Safety and Emergency Egress Procedures.

e. Site specific fall protection plan and training.

f. Microbial remediation hazards and practices including engineering controls and isolation. Training should include "hands on" training for microbial remediation supervisors.

g. Workers' release forms stating the potential hazards involved with the scope of the work.

Worker Training Certification: Submit copies of training certificates for each employee indicating that the employee has received training at the appropriate level for the work prescribed in the description of work.

1.4.1.5 Certified Industrial Hygienist (CIH)/Industrial Hygienist (IH) Qualifications

Submit the name, address, and telephone number of the Certified Industrial Hygienist (CIH) and Industrial Hygienist (IH). Provide copies of board certificates, resume to document field experience, and evidence that the CIH and IH have successfully completed training in microbial investigation and remediation.

1.4.1.6 Microbial Remediation Supervisor Qualifications

Onsite supervisor shall have one of the following certifications: Certified Mold Remediator (CMR), Certified Mold Remediation Supervisor (CMRS), or Applied Microbial Remediation Specialist (AMRS). Submit copies of supervisory training certificates.

1.4.2 Product Data

Within 10 days of contract award, submit product data for items identified for use in Microbial Remediation Plan.

1.4.3 Daily Reports

Prepare a written report for each day that microbial remediation work is being accomplished. Submit this report to the Contracting Officer by 1000 hours of the following day, attached to the Contractor Quality Control Report. Referred to collectively as the IH Daily Report, the report at a minimum shall include measurements of differential pressure and temperature and relative humidity in work areas, and detail any non-compliance issues observed.

1.4.4 Submittals at Completion of Remediation Work

Within 14 days of completion, provide the following information:

a. Supervisor Logs.

b. IH Daily Reports.

c. Photographic Logs.

d. Contractor's Industrial Hygienist Report certifying the microbial remediation is complete.

1.5 RECORD KEEPING

A Daily Project Log shall form a permanent record of the project. Secure and maintain these logs and any other required documentation as part of the permanent project file.

1.5.1 Daily Log

The Microbial Remediation Supervisor shall maintain a Daily Project Log. The Daily Project Log shall be used each day of the project to document the following information.

a. Date.

b. Name of Microbial Remediation Supervisor.

c. Name of Industrial Hygienist monitoring work area.

d. Number of workers on site.

e. Equipment utilized.

f. Brief description of daily work activities.

g. Listing of any non-compliance noted, emergencies, stop work orders (with detailed explanation), exhaust system pressure differential recordings and descriptions of any other significant events.

PART 2 PRODUCTS

2.1 DISINFECTANTS, BIOCIDES, SANITIZING SOLUTIONS AND FUNGICIDAL AGENTS, (EPA)

Shall be approved by EPA for the use detailed in the Microbial Remediation Plan and used in accordance with the manufacturer's specifications.

PART 3 EXECUTION

3.1 EQUIPMENT

Provide protective clothing and respirators as required by the Microbial Remediation Plan for use by any authorized visitors. Provide manufacturer's certificate of compliance for all equipment used to contain the microbial contamination. Contractor shall not be required to certify that visitors entering work areas be capable of wearing respirators.

3.1.1 Respirators

Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services. Provide personnel engaged in set-up, pre-cleaning, cleanup, handling, and removal of contaminated materials with the appropriate respiratory protection as specified in 29 CFR 1910.134. Microbial remediation plan shall consider Table 17.1 in AIHA IMOM08-679 "Recognition, Evaluation, and Control of Indoor Mold", which lists the minimum levels of respiratory protection based on the activity and size of the remediated area.

3.1.2 Protective Clothing

Provide all workers with protective clothing as appropriate for the work being accomplished, as required by the Microbial Remediation Plan.

Do not permit any person to enter the work area without the appropriate protective clothing and equipment.

3.1.3 Warning Signs and Labels

Provide bilingual warning signs printed in English and Spanish at all approaches to the work areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Warning signs may be in the form of continuous plastic tape. The warning signs shall have black characters on a yellow background.

WARNING
DO NOT ENTER
MICROBIAL REMEDIATION WORK IN PROGRESS

Alternate wording for the warning signs will be approved by the Contracting Officer.

3.1.4 Dehumidifiers

Install and use dehumidifiers as needed during the remediation to maintain relative humidity below 60 percent in the work area. Drain the condensate water to a permanent drain, or empty as needed to prevent water overflowing from the dehumidifiers.

3.1.5 Air Filtration Units (AFU)

Install and use AFUs with HEPA filters, and manufacturer specified pre-filters, as part of the exhaust ventilation system to develop and maintain the specified desired air pressure differential inside the enclosed work area relative to the outside areas. The Contractor shall be responsible for acquiring and paying for any licenses needed for use of any equipment, including but not limited to, air pressure differential systems and air filtration systems.

Replace HEPA filters and pre-filters for AFUs as required to maintain pressurization performance requirements during demolition and cleaning. Do not reuse filters. Bag used filters at a minimum in clear 6 mil polyethylene bags within the containment and disposed as contaminated waste.

Discharge air from any AFUs located in the work area containment to the outside environment when creating a negative pressure containment to create a negative pressure relative to occupied areas of 0.02 inch H2O to 0.04 inch H20. Discharge air in excess of that required for creating the proper negative pressure to the work area. The AFUs shall provide four to six air changes per hour in the work area. Under no circumstances may air from AFUs discharge to an occupied area. Coordinate location of window sashes or doors required for discharge openings with the Contracting Officer. Seal around openings used for discharge of exhaust air airtight. Exhaust discharge openings may be constructed of plywood.

Seal all exhaust and intake openings in AFUs with one layer of 6 mil polyethylene sheeting when not in use.

3.1.6 Vacuum Cleaners Equipped with HEPA Filters

Provide vacuum cleaners equipped with HEPA filters designed for continuous operation to perform the work in a timely and efficient manner.

Provide nozzle attachments as required to adequately remove all dust. As a minimum, nozzle attachments shall include crevice and extended bristle brush nozzles. Any vacuum that is not equipped with a HEPA filter shall not be used at anytime.

Provide sufficient vacuum cleaners equipped with HEPA filters designed for continuous operation in the work area during microbial remediation inside the containment area.

Provide additional vacuum cleaners equipped with HEPA filters in the enclosed work area during remediation or cleaning work as required by the size (area) of the containment and to maintain timely progress of the work.

3.2 GENERAL REQUIREMENTS

3.2.1 Pre-Microbial Remediation Work Conference

Meet with the Contracting Officer prior to beginning work to discuss in detail the Microbial Remediation Plan, including work procedures and safety precautions. Once approved by the Contracting Officer, the plan shall be enforced as if a part of this specification. Any variances to the specification as a result of the plan shall be specifically identified to allow for free discussion and approved by the Contracting Officer in writing prior to starting work. Before work in areas containing Asbestos Containing Material (ACM) and Presumed Asbestos Containing Materials (PACM) and Lead is begun, Contractor shall identify the presence, location, and quantity of ACM, PACM and Lead. Ensure proper notification of regulatory authorities. Contractor shall consult with Contracting Officer to obtain facility ACM / LBP surveys.

3.2.2 Containment Entry / Exit Procedure

Ensure that each worker and authorized visitor follows entry and exit procedures detailed in the Microbial Remediation Plan.

3.3 REMOVAL PROCEDURES

3.3.1 Protection of Existing Work Areas

Perform work in a manner to minimize the damage or contamination to areas outside or directly adjacent to the work area. Contractor is required to inspect areas inside and outside proposed work areas to identify existing damage and notify Contracting Officer prior to start of work.

Where materials outside work area are damaged or contaminated as a result of the Contractors work efforts as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting officer. Should adjacent or outside areas become contaminated as a result of the Contractors work efforts the work shall stop immediately. The newly contaminated areas shall be cleaned and verified by visual inspection by the IH. The work may proceed at the discretion of the Contracting Officer once the area has been verified as restored.

3.3.2 Remediation of Fungally Contaminated Building Materials

The removal of contaminated materials shall follow in general the listed sequence of work. The Contractor may make changes to improve work flow with the approval of the Contracting Officer.

a. Provide level of containment and PPE required by the Microbial Remediation Plan.

b. Disable all HVAC units and exhaust fans in the area to be remediated.

c. Protect materials to remain in work area. Where possible, all

materials to be salvaged should be cleaned in place to prevent possible cross-contamination created by moving materials through non-remediation areas.

d. Remove undamaged items and materials to be cleaned and salvaged from the work area. Materials shall be stored in an area with relative humidity maintained below 60 percent and where temperatures will not damage the material. Notify Contracting Officer of existing damage to items prior to removal.

e. Set up containments, including protection of materials remaining within the containment and AFUs. Notify Contracting Officer that the area is prepared for remediation activities.

f. Pre-demolition inspection by the Contracting Officer.

g. Demolition and removal / cleaning of contaminated materials.

h. Post-remediation inspection by the Contracting Officer.

i. Perform final cleaning in the containment.

j. Clean carpet in the containment.

k. Clearance inspection by the Contracting Officer.

l. Duct and HVAC cleaning, if necessary.

m. Deconstruction of containment, removal of AFUs.

n. Clean previously removed items prior to returning to occupied area.

3.3.3 Remediation Procedures

Procedures for remediation depend on the amount of mold growth and the type of material with fungal growth.

3.3.3.1 Remediation of Non-Porous Materials

The method of remediating non-porous items shall be:

a. HEPA vacuum all surfaces.

b. Damp wipe all surfaces using clean water or a detergent solution.

3.3.3.2 Semi-Porous Materials (Unfinished Wood)

The method of remediating unfinished wood-based items, including wood and wood framing in wall cavities, shall be:

a. Cleaning

(1) HEPA vacuum all surfaces.

(2) Scrub surfaces with a brush and detergent to remove mold.

(3) HEPA vacuum all surfaces to remove dust.

(4) Repair finishes as required to match original.

b. Removal

Where unfinished wood product has been structurally damaged, remove and replace with an equivalent product. This shall include wall studs and sheathing, such as OSB used in flooring, wall, or roof construction.

3.3.3.3 Semi-Porous Materials

The method of surface cleaning semi-porous materials such as concrete, vinyl wall covering, linoleum, leather furniture, and finished wood products shall be:

a. HEPA vacuum all surfaces.

b. Damp wipe surfaces with using clean water or a detergent solution. Avoid over-wetting the material.

3.3.3.4 Porous Materials

a. Carpet

(1) Removal: Replace carpet that has remained wet for 48 hours or longer.

(2) Cleaning: Use a dry absorbent compound cleaning method as designated by IICRC S100. This method uses an absorbent compound to dissolve, suspend and absorb carpet soils. It does not add moisture back into the carpet.

b. Gypsum Wallboard (GWB)

(1) Removal: Replace Gypsum Wallboard that has remained wet for 48 hours or longer, or has visible mold growth. Where removal of GWB exposes insulation, remove and replace the insulation with an insulation having equal characteristics for insulating value and permeability.

(2) Surface Cleaning: Where GWB has a small amount of surface mold growth and the GWB is structurally sound, a surface cleaning method may be used with the permission of the Contracting Officer. The method of surface cleaning GWB shall be HEPA vacuum all surfaces. Surface cleaning shall not be used where mold growth penetrates wallboard substrate.

c. Ceiling Tile

(1) Removal: Replace ceiling tile that has remained wet for 48 hours or longer, or has visible mold growth.

(2) Surface Cleaning: Where settled dust on ceiling tiles contains mold spores and the ceiling tile is structurally sound, is not sagging, and has not been wet, a surface cleaning method may be used with the permission of the Contracting Officer. The method of surface cleaning ceiling tile shall be HEPA vacuum all surfaces. Surface cleaning shall not be used where mold growth is occurring on ceiling tiles.

d. Paper Materials

Contractor personnel cannot be granted access to classified information and / or Controlled Unclassified Information until they have met the security requirements stated in the paragraph SECURITY REQUIREMENTS.

(1) Removal: Discard paper materials that have remained wet for 48 hours or longer, or that have visible mold growth. Classified and Controlled Unclassified Information must be destroyed by appropriately cleared contractor personnel using an approved DOD destruction method that is authorized for the specific level of information.

(2) Containment: Where paper materials, such as personnel records must be retained, the following containment methods may be used with the permission of the Contracting Officer. The method of containment for paper products shall be:

(a) Thoroughly dry the paper material. Classified and Controlled Unclassified Information must be safeguarded at all times in a GSA approved security container, restricted area, vault, or under the direct physical control of appropriately cleared contractor personnel.

(b) Where routine access to the material is required, a copy shall be made. Contractor personnel shall not reproduce copies of classified information or controlled unclassified information without the prior written approval of the Contracting Officer and the NAVFAC LANT security department. If approval is obtained, only appropriately cleared Contractor personnel shall be authorized to reproduce the information and they must use only DOD authorized reproduction equipment.

(c) When not in use, the classified and controlled unclassified information must be secured in an approved GSA security container, restricted area, or vault. Limit access to the container to only appropriately cleared Contractor personnel. Implement an access procedure involving opening the container in a secure area with provision for capturing mold spores and respiratory protection for workers opening the container for these materials. Store the container in an area where the relative humidity is maintained below 60 percent to prevent further mold growth.

e. Textiles

(1) Discard textiles with visible mold growth.

(2) Clean textile based items, including clothing, linens, and toys that do not have visible mold growth, but have been wet, in standard commercial or residential washing machines with standard washing machine detergent.

(3) Dry all items completely before returning to the building / house.

(a) When possible, use dryers to dry items.

(b) If dryers will cause irreversible harm to the item, hang the item on a drying rack in a temperature and humidity controlled space. Discard items not dry within 48 hours.

f. Upholstered Furniture

(1) Removal: Discard upholstered furniture that has remained wet for 48 hours or longer, or that have visible mold growth.

(2) Cleaning: Clean upholstered furniture that has been exposed to mold spores but does not have visible mold growth by HEPA vacuuming upholstery and wood or metal structure, followed by a damp wipe of semi-porous or non-porous portions of the furniture.

3.4 DETAILED SEQUENCE OF WORK FOR MOLD REMOVAL UNDER CONTAINMENT

3.4.1 Preparation for Remediation Work

a. Provide level of containment and PPE required for the remediation based on the Microbial Remediation Plan.

b. Disable all HVAC units and exhaust fans in the area to be remediated.

c. Remove undamaged materials from the work area if they are to be salvaged but cannot be cleaned in place. Store materials in an area with relative humidity maintained below 60 percent and where temperatures will not damage the material. Notify Contracting Officer of existing damage to items prior to removal. Clean materials using procedures detailed in Remediation Procedures.

d. Remove supply diffusers, return grilles and exhaust grilles. Clean diffusers and grilles using procedures detailed in Remediation Procedures.

e. Construct containment barriers. Existing walls can be used as a portion of the containment barriers if existing openings in walls (such as doors, wall openings, vents, etc.) are sealed using polyethylene.

f. Install the AFUs and dehumidifiers.

g. Seal supply, return, and exhaust openings with polyethylene sheeting and protect intakes to air handling units. Air handling units shall remain off.

h. Install all equipment needed for removal work in the containment area to minimize egress during demolition.

i. The Contracting Officer will inspect the containment to verify that the containment is properly constructed and the containment area has an overall negative pressure of 0.02 to 0.04 inch water column relative to the outside and adjacent work areas not undergoing active remediation, prior to beginning demolition work.

3.4.2 Demolition

a. Remove mold contaminated materials to be discarded, such as paper, and furniture. Double bag material in 6 mil poly bags. Seal poly bags using duct tape inside the containment. HEPA vacuum bags before removing them from the containment or airlock. When possible, pass the bags directly from the containment or airlock to the outside. Transport bags to a dumpster. Do not leave the bags at the building / house.

b. Remove contaminated gypsum wallboard (GWB) at the preliminary limits of demolition specified in the Microbial Remediation Plan. Inspect back side of removed GWB. If mold is observed on the back side of the GWB, report this condition to the Contracting Officer. After obtaining Contracting Officer approval, continue removing GWB until no mold is observed. If hidden mold is discovered that will extend past the extents of the containment, stop work immediately and reconstruct the containment to extend past the suspected contamination. Re-evaluate level of containment and PPE. Continue to operate AFUs during reconfiguring of containment.

c. Remove drywall by cutting in pieces as large as possible to minimize aerosolization of fungal spores. Drywall screws can either be backed out during removal or later during cleanup.

d. Use dust collection attachments on all power tools, such as sanders, saws, etc., to capture dust created when using the tools. Outlet of dust collector should discharge into inlet of AFU.

e. Remove fiberglass insulation behind removed gypsum board.

f. If wood studs are contaminated, scrub them with a brush and detergent to remove mold. Replace wood studs with damage severe enough to reduce the structural capacity of the member. Prior to removal of any structural member consult with the Contracting Officer.

g. Clean all metal framing with a dilute detergent solution. Clean metal framing with light rust using steel wool and coat with a rust inhibiting paint. Replace metal framing with rust damage severe enough to reduce the structural capacity of the member. Prior to removal of any structural material, consult with the Contracting Officer.

h. Remove contaminated carpet scheduled for removal.

i. Place removed gypsum board, insulation, carpet and remaining debris in two layers of 6 mil poly bags. Seal poly bags using duct tape inside the containment. HEPA vacuum bags before removing them from the containment or airlock. When possible pass the bags directly from the containment or airlock to the outside. Transport bags to a dumpster. Do not leave the bags at the building / house. Remediation workers shall HEPA vacuum their PPE, then remove them within the airlock chamber. Discard disposable coverall suits into a 6 mil poly bag.

3.4.3 Post-Demolition Inspection

a. The Contracting Officer will inspect the containment area to verify that all contaminated materials have been removed.

b. Allow a minimum of 12 hours after completion of removal work, with AFUs operating, for airborne dust in the containment to settle and / or be removed by the AFUs.

3.4.4 Cleaning after Demolition, and Cleaning of Settled Spores from Porous / Non-Porous Materials

a. Continue to operate AFUs during cleaning.

b. Clean exposed surfaces.

(1) HEPA vacuum all surfaces.

(2) Damp wipe all non-porous exposed surfaces including polyethylene sheets used to protect materials, external surfaces of ductwork, studs, and floors with clean rag and clean potable water or detergent solution.

(3) Remove poly sheeting inside the containment.

(4) HEPA vacuum all surfaces protected by poly sheeting.

(5) Damp wipe non-porous surfaces protected by poly sheeting with clean water or a detergent solution.

(6) Clean carpet using procedures in Remediation of Fungally Contaminated Building Materials.

c. Final clearance inspection will be conducted by Contracting Officer. Clearance inspections will be performed using the procedures detailed in Post-Remediation Inspection. Maintain containments in place until spaces are inspected and accepted by the Government as being fully remediated. The Government will determine whether the Contractor shall conduct additional cleaning and repeat the clearance process.

3.5 DUCT AND HVAC SYSTEM CLEANING

3.5.1 Contractor Qualifications

a. The HVAC cleaning contractor shall be a certified member of NADCA.

b. The HVAC cleaning contractor shall have at least one individual with Ventilation System Mold Remediator Qualifications certified by NADCA onsite during duct and HVAC system cleaning.

3.5.2 Inspection

IH shall visually inspect the HVAC system serving all work areas (or as required in the initial Microbial Assessment Survey performed by the Government), and determine if additional remediation is needed to clean the HVAC system, thus preventing re-contamination. Notify the Contracting Officer of the inspection results. The Contractor must receive written approval from the Contracting Officer before proceeding with HVAC microbial remediation.

a. Follow requirements of the NADCA ACR "Standard for Assessment, Cleaning, and Restoration of HVAC Systems".

b. Using a "gassing" or "fogging" method of cleaning with gaseous chlorine dioxide or ozone will not be allowed.

c. Disable all HVAC equipment prior to cleaning any component of the system.

d. The method of cleaning the air handling units, terminal units, blowers and exhaust fans shall be:

(1) Construct a limited containment around equipment to be cleaned. Provide appropriate PPE for workers.

(2) Remove filters. Seal filters in 6 mil poly bags for disposal.

(3) Disassemble units as necessary to clean components. Contractor is responsible for reassembling equipment after cleaning.

(4) Clean disassembled components within the containment or in a separate two chamber cleaning containment. Seal disassembled components in 6 mil poly bags for transport out of building / house.

(5) HEPA vacuum all surfaces.

(6) Damp wipe all non-porous surfaces and components with clean water or a detergent solution.

e. The method of cleaning HVAC coils shall be:

(1) Clean coils using a method which will render the coil visibly clean. Coil cleaners shall be non-acidic / alkaline, detergent based. Clean condensate drain pans. The drain for the condensate drain pan shall be operational during the cleaning.

(2) Rinse coils and drain pans with clean water to remove any latent residues.

(3) Cleaning methods shall not cause damage to the coil surface or fins.

(4) Cleaning must restore the coil pressure drop to within 10 percent of the pressure drop measured when the coil was first installed. If the original pressure drop is not known, the coil shall be considered clean only if the coil is free of foreign matter and chemical residue.

f. The method of cleaning the duct system shall be:

(1) During cleaning, connect a vacuum collection system to the downstream end of the section being cleaned. The vacuum collection device must be of sufficient power to render all areas of duct being cleaned under negative pressure relative to rooms and areas of duct not being cleaned. Negative pressure must be verified at the furthest point from the collection system with a micromanometer and verification measurements included in the Daily Report.

(2) Equip the vacuum collection systems with HEPA filters. Exhaust the vacuum collection systems directly to the outside.

(3) Use mechanical agitation devices to dislodge debris adhered to the ductwork, such that debris may be safely conveyed to vacuum collection devices. Cleaning methods shall not damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork.

(4) HEPA vacuum duct surfaces.

(5) When possible, damp wipe metal duct surfaces with clean water or detergent solution. Do not wet fibrous glass thermal or

acoustical insulation.

(6) Identify areas where there is evidence of damage to or uncleanable mold in duct insulation. The Contracting Officer will make the decision to discard the insulation, if necessary.

g. Final clearance of HVAC and duct system will be based on a visual assessment (no visible dust, no visible mold) by Contracting Officer.

3.6 FIRE PROTECTION

The Contractor shall provide portable fire extinguishers within the containment area and outside the decontamination unit. Fire extinguishers shall be rated for the class of fire hazards in the work area and shall be sized for coverage of the areas within the containment. At a minimum, one 10 pound ABC fire extinguisher for every 1,000 square feet shall be strategically placed around the containment. Personnel shall be trained for emergency egress and the use of fire extinguishers. Notify fire officials of work activities as required.

3.7 CONSTRUCTION BARRIERS

a. Provide interior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain. Shoring, bracing or support will be necessary when structural wood studs or metal framing need to be removed and replaced when they cannot be cleaned.

b. Do not disturb microbial-contaminated building materials while isolating work areas. This precaution prevents the release of microbial spores.

c. Workers shall wear respirators and other PPE as outlined in the microbial remediation plan when installing critical barriers where microbial contaminated surfaces (walls or surfaces with visible settled dusts) are likely to be disturbed. Operate an AFU if disturbance is likely during setup.

d. Monitor the air pressure differential across work area containments. The monitoring system shall be in place before the start of remedial activities. Verification by the Industrial Hygienist is required prior to the start of the microbial remediation.

3.8 QUALITY ASSURANCE / QUALITY CONTROL REQUIREMENTS

3.8.1 Contractor Qualifications

Work shall be performed by a qualified remediation contractor. Contractor shall carry insurance that specifically covers mold remediation.

Remediation contractor's on-site supervisor shall have one of the following certifications: Certified Mold Remediator (CMR), Certified Mold Remediation Supervisor (CMRS), or Applied Microbial Remediation Specialist (AMRS). Qualified supervisor shall be onsite whenever active remediation is being performed. Set-up activities may be performed without supervisor present; qualified supervisor shall review set-up prior to start of work.

Mold remediation workers shall be given training in PPE and mold remediation activities as required for their particular job. Microbial

remediation plan shall provide details of worker training.

3.8.2 Waste Management and Removal

Keep the site and work area free from accumulations of dust, waste materials, or rubbish caused by Contractor operations and free from any flammable materials or other sources of fire hazard. Remove all waste materials and rubbish from and about the work site in strict accordance with the specifications and applicable codes and regulations.

3.8.3 Post-Remediation Inspection

Clean up all debris and dust in interior spaces outside the work area resulting from the Contractor's remediation work.

After all visible accumulations of material and debris are removed from the containment, provide the Contracting Officer a 24-hour notice for a final clearance visual inspection. The Contracting Officer and Contractor's Industrial Hygienist shall conduct a thorough visual inspection of the work area. If during this inspection any visible debris and/or microbial contamination are observed, the Contractor shall re-clean the work area without additional cost to the Government.

3.8.3.1 Clearance

a. Clearance Criteria

Clearance will be based on visual assessment (all visible mold removed, all visible dust removed, based on a "white glove" test) by Contracting Officer. "White glove" test shall consist of wiping the surface with a clean cloth of color suitable to reveal expected type of dust. For most surfaces, a white cloth is suitable. For GWB dust, a dark cloth may be more appropriate.

b. Failed remediation areas will be recleaned and the AFUs kept in operation another 12 hours, followed by another visual assessment. Subsequent failures will follow the same routine until a pass condition is secured.

3.9 CLEAN-UP AND DISPOSAL

3.9.1 Disposal of Material

Dispose of contaminated bagged waste materials removed during this remediation as general construction debris. Follow all applicable local, State, and Federal requirements for the disposal of this material.

3.9.2 Material Packaging

Place waste, as waste is removed, into a disposal container promptly. Disposal containers shall consist of at a minimum, two layers of clear 6 mil polyethylene bags. Tape bags in a gooseneck fashion to form an airtight seal and label appropriately. Bag waste from vacuums equipped with HEPA filters in 6 mil polyethylene bags.

3.9.3 Building Exit (Waste Disposal)

HEPA vacuum and damp wipe bags of contaminated waste material prior to removal from the building.

3.9.4 Hazardous Material

Should the Contractor encounter any hazardous materials, notify the Contracting Officer immediately for direction.

3.10 Appendices

Appendix A - Microbial Assessment Visual Field Report Form
Appendix B - Sample Mold Remediation Clearance Criteria For Buildings Housing Sensitive Populations

Appendix A

Microbial Assessment Visual Field Report Form

TO DOWNLOAD THIS FORM, SEE UFGS GRAPHICS
Go to http://www.wbdg.org/ccb/NAVGRAPH/graphtoc.pdf.

Appendix B

Sample Mold Remediation Clearance Criteria
For Buildings Housing Sensitive Populations

-- End of Section --

DESIGN-BUILD TABLE OF CONTENTS – 6 PART FORMAT

PART 3 – PROJECT PROGRAM (BY OTHERS)

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DESIGN-BUILD TABLE OF CONTENTS – 6 PART FORMAT

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SECTION A10

FOUNDATIONS
09/15

A10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

A10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

A10 1.1.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, ArchitectureUFC 3-220-01, Geotechnical EngineeringUFC 3-301-01, Structural Engineering)

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS Section 31 23 00.00 20	Excavation and Fill

A10 1.2 GENERAL REQUIREMENTS

A10 1.2.1 Earthwork

The Designer of Record shall prepare the following UFGS Specification as part of the project specification and shall include the prepared specification section in the design submittal for the project:

Section 31 23 00.00 20 *Excavation and Fill*

A10 1.2.2 Geotechnical Report

A10 1.2.2.1 Subsurface Soils Information

Any provided subsurface soil information is included for the contractor’s information only, and is not guaranteed to fully represent all subsurface conditions. The data included in this RFP is to assist in proposal preparation. Contractor shall perform, at his expense, such subsurface exploration, investigation, testing, and analysis as his Designer of Record deems necessary for the design and construction of the foundation system.

A10 1.2.2.2 Contractor-provided Geotechnical Engineer

The Contractor is required to retain a Geotechnical Engineer experienced and licensed in the geographic region of the project to interpret any provided data as related to his design concept and develop requirements for bidding. Requirements stated in Parts 3 and 4 of the RFP take precedence over any content of any included geotechnical report. Additional requirements for the geotechnical design of this project are provided elsewhere in this RFP.

All work by the Contractor-provided Geotechnical Engineer at the project location shall be coordinated with the Contracting Officer and shall not interfere with normal base operations. When providing the Foundation Work Design submittal, provide the Contractor's Geotechnical Report (an Adobe Acrobat PDF version on CD and two printed copies) for review and record keeping purposes. The report shall become the property of the Government. Provide the Geotechnical reports generated during construction, such as pile load tests or PDA results, pile driving results and analysis, to the Contracting Officer (an Adobe Acrobat PDF version and two printed copies) for record keeping purposes.

A10 1.2.2.3 Contractor-Provided Geotechnical Report

Submit a written Geotechnical report based upon Government-provided subsurface investigation data and all additional field and laboratory testing accomplished at the discretion of the Contractor's Geotechnical Engineer. The Geotechnical Report must include all requirements listed in UFC 3-220-01, *Geotechnical Engineering*, paragraph entitled "Section 1803 "Geotechnical Investigations"; in addition, include the following:

a. The project site description, vicinity map and site map indicating the location of borings and any other sampling locations. Provide 24 hour groundwater observations for at least 20% of the borings, minimum one boring. Provide notes explaining any abbreviations or symbols used and describing any special site preparation requirements.

b. Results of all applicable field and laboratory testing, whether Government or Contractor-provided. Address existing subsurface conditions, selection and design of the foundation and floor slab, all underground construction including utility installation and all other site-specific requirements (such as soil stabilization and slope stability).

c. Engineering analysis, discussion and recommendations addressing:

1) Settlement analysis. Settlement shall be limited as required in EM 1110-1-1904, *Settlement Analysis*

2) Bearing Capacity Analysis.

3) Foundation selection and construction considerations (shallow, deep, special); dimensions, and installation procedures.

4) Site preparation (earthwork procedures and equipment), compaction requirements, building slab preparation (as applicable), soil sensitivity to weather and equipment, groundwater influence on construction, mitigation of expansive soils or liquefaction potential, dewatering requirements, slope stability, and other necessary instructions.

5) Sheeting and shoring considerations, as applicable

6) Pavement design calculations with parameters defined, actual or assumed, and recommended thicknesses and materials, whether for design or for proposed modifications to the RFP provided pavement design

7) Haul routes and stockpile locations for earthwork, as applicable.

8) Calculations to support conclusions and recommendations.

9) Recommendations shall be presented on a structure-by-structure Basis.

The Geotechnical Report must be signed by the Contractor-provided Geotechnical Engineer.

The submitted report must be accompanied by a cover letter identifying any report recommendations of the report proposed to be adopted into the design which are interpreted by the Contractor as a change condition to the Geotechnical or Pavement related requirements of the RFP.

A10 1.2.2.4 Geotechnical Site Data required in Design Drawings

The Contractor's final design drawings shall include the Government-provided subsurface data presented in the RFP as noted below, as well as all additional borings and laboratory

test data results performed by the Contractor. The data provided shall include:

a. Logs of Borings and related summary of laboratory test results and groundwater observations. Provide 24-hour groundwater observations for at least 20% of the borings, minimum one boring. Provide notes explaining any abbreviations or symbols used and describing any special site preparation requirements.
b. The locations of all borings shall be indicated on the drawings. The applicable design drawings shall be revised to reference the Contractor’s Geotechnical Report as being a basis for design.

A10 1.2.3 Pile Driver Analyzer (PDA)

If deemed necessary by the Designer-of-Record's geotechnical engineer, the dynamic wave equation method of analysis, pile driver analyzer, shall be used to validate pile and pile hammer compatibility, establish pile driving criteria, establish terminal penetration resistance, or verify as-driven capacity of the pile. The PDA or static load test(s) shall be required for piles with required allowable design capacity equal to or greater than 40 tons.

A10 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory construction and system performance of the foundations shall be via Performance Verification Testing, and by field inspection, as detailed in this section of the RFP and in UFGS Section 01 45 00.05 20. Provide special tests and special inspections in accordance with UFGS Section 01 45 00.05 20, *Design and Construction Quality Control*.

A10 1.3.1 Earthwork

Perform quality assurance for earthwork in accordance with IBC Chapter 17 and UFGS Section 31 23 00.00 20. A competent person, as defined by COE EM 385-1-1, under supervision of a registered Professional Engineer is required to provide inspection of excavations and soil/groundwater conditions throughout construction. The Engineer shall be responsible for performing periodic site visits throughout construction to assess site conditions. The Engineer, with the concurrence of the contractor and the Contracting Officer, shall update the excavation, sheeting, shoring, and dewatering plans as construction progresses to reflect actual site conditions and shall submit the updated plan and a written report (with professional stamp) at least monthly informing the Contractor and the Contracting Officer of the status of the plan and an accounting of Contractor adherence to the plan; specifically addressing any present or potential problems. The Engineer shall be available to meet with the Contracting Officer at any time throughout the contract duration.

A10 1.3.2 Piles

If piles are required, perform quality assurance for pile construction in accordance with UFC 1-200-01, *General Building Requirements*. Pile installation procedures and installed piles shall be inspected and

found to be in compliance with these specifications prior to acceptance of the work.

Install test piles as directed by the Contractor's Geotechnical Engineer. Pile load tests, if required, shall be performed in accordance with UFC 1-200-01. Test pile installation procedures shall be as directed by the Contractor's Geotechnical Engineer. Results of the pile test program and final pile installation criteria shall be submitted to the Contracting Officer prior to installation of the production piles. If deemed necessary by the Designer-of-Record's Geotechnical Engineer, the dynamic wave equation method of analysis, pile driver analyzer, shall be used to validate pile and pile hammer compatibility, establish pile driving criteria, establish terminal penetration resistance, or verify as-driven capacity of the pile. The PDA or static pile load test (ASTM D 1143) shall be required for piles with an allowable design capacity equal to or greater than 40 tons. When required, perform PDA on all indicator or test piles. Perform CAPWAP analysis on at least one test (indicator) pile to determine capacity with a minimum three day set-up and develop pile installation criteria.

A10 1.4 DESIGN SUBMITTALS

Design submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures,*UFC 3-220-01, *Geotechnical Engineering, and UFC 1-200-01, General Building Requirements*.

UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. The DOR shall edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS section Z10, *General Performance Technical Specifications*.

UFGS Section 31 23 00.00 20 *Excavation and Fill*

A10 1.5 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following submittals as a minimum:

All structural elements necessary for construction

Contractor-provided geotechnical report

Controlled fill or backfill material tests

Test pile and production pile installation records

Pile load testing reports

As-Built drawings - Include a statement on the drawings indicating the method used to verify the allowable design capacity of the piles (load tests or PDA).

A1010 STANDARD FOUNDATIONS

A1010 1.1 SHEETING AND SHORING

Provide sheeting and shoring as required. Sheeting and shoring plans shall be signed by the Contractor's Geotechnical Engineer.

A1010 1.2 TERMITE CONTROL

A1010 1.2.1 Termite Control Barrier System

Formulate and apply termiticide in accordance with the manufacturer's label directions. The termiticide label shall bear evidence of registration by the U.S. Environmental Protection Agency or appropriate requirements of the host country.

Apply termiticide to the soil that will be covered by or lie immediately adjacent to the building(s) and structure(s), providing a protective barrier against subterranean termites.

Maintain the Pest Management Maintenance Record, DD Form 1532-1 and submit the Pest Management Report, DD Form 1532 as required.

Applicator(s) shall be licensed or certified by the Federal government or the state or the host country, as applicable.

A1010 1.2.2 Warranty

Furnish a 3 year written warranty against infestations or reinfestation by subterranean termites of the buildings or building additions constructed under this contract. Perform annual inspections of the building(s) or building addition(s). If live subterranean termite infestation or subterranean termite damage is discovered during the warranty period, and building conditions have not been altered in the interim, the Contractor shall:

a. Perform treatment as necessary for elimination of subterranean termite infestation;
b. Repair damage caused by termite infestation;
c. Reinspect the building approximately 180 calendar days after the repair.

A1010 1.2.3 Visual Inspection Guide

To maintain resistance to termites, complete the system and do not disturb, penetrate or damage during the remaining contract time period. Provide Manufacturer’s Guidance for performing a visual assessment of the installed system to ensure the system provides the designed termite physical barrier.

A101001 WALL FOUNDATIONS

Provide foundation walls as required in accordance with the requirements of this section and other portions of this RFP.

A101002 COLUMN FOUNDATIONS AND PILE CAPS

Provide column foundations or pile caps and grade beams as required in accordance with the requirements of this section and other portions of this RFP.

A1020 SPECIAL FOUNDATIONS

A102001 PILE FOUNDATIONS

Where piles are required, design, install, and test piles (including sheet piles, as applicable) in accordance with UFC 1-200-01, except as noted otherwise. Provide piles in accordance with the requirements of the Contractor’s Geotechnical Engineer, and the following paragraphs.

A102001 1.1 DRIVING EQUIPMENT

Install piles (including sheet piles, as applicable) to the required tip elevation and capacity with the appropriate equipment as recommended by the Contractor's Geotechnical Engineer. Pile hammer shall be of sufficient weight and energy to suitably install piles without damage.

Drive production piles with the same hammer, cap block, and cushion materials, and using the same operating conditions as test piles, including pre-augering and spudding.

Pile driving equipment shall match the equipment assumptions on which the pile driving formulae used to determine blow counts are based.

A102001 1.2 INSTALLATION TOLERANCES

Locate the center of pile butts not more than four horizontal inches from the location indicated at cutoff elevation. Manipulation of the piles is not permitted. In addition to the stated tolerances, the clear distance between the heads of piles and the edges of pile caps shall be a minimum of five inches.

Locate top of sheet piles at cutoff elevation within 1/2 inch horizontally and 2 inches vertical of the location indicated. Manipulation of the piles is not permitted.

A variation of not more than 2 percent from the vertical for plumb piles, or not more than 4 percent from the required angle for batter piles will be permitted.

A102001 1.3 MISLOCATED AND DAMAGED PILES

Remove and replace with new piles those piles that are damaged, mislocated, or installed out of alignment tolerance or provide additional piles, installed as directed by the Contractor's Geotechnical Engineer and approved by the Contracting Officer, at no additional cost to the Government.

A102001 1.4 PILE SPACING

For cast-in-place concrete or augercast piles, provide adequate distance, as determined by the Contractor's Geotechnical/Structural Engineer, between freshly placed concrete and other pile installation operations to avoid damage to concrete.

A102001 1.5 COATED PILES

Handle treated or coated piles so as to protect the treatment or the coating. Repair damage or defects to treatment or coating.

A102002 CAISSONS

If required, provide caissons as required in accordance with the requirements of this section and other portions of this RFP.

A102003 UNDERPINNING

If required, underpin existing construction as required in accordance with the requirements of this section and other portions of this RFP.

A102004 DEWATERING

Dewater site for foundation construction as required by soil conditions and local subsurface and surface water, including rainfall, and considering any potential adverse impact on adjacent facilities, including settlement. Dewatering requirements and methods shall be established by the Contractor’s Geotechnical Engineer, based on his subsurface exploration and investigation.

A102005 RAFT FOUNDATIONS

If required, provide a raft foundation as required to achieve the requirements of this section and other portions of this RFP and as required by the Contractor’s Geotechnical Engineer.

A102006 PRESSURE INJECTED GROUTING

If required, pressure inject grout as required in accordance with the requirements of this section and other portions of this RFP.

A1030 SLAB ON GRADE

A103001 STANDARD SLAB ON GRADE

If allowed by site conditions and recommended by the Contractor-provided Geotechnical Engineer, provide standard concrete slab on grade to meet the required loading requirement in accordance with the requirements of this section and other portions of this RFP.

Floor slab on grade shall be designed and constructed in accordance with EM 1110-1-1904, Settlement Analysis and so that any settlement of the floor slab shall not result in harmful distortion of the floor, nor vertical misalignment of the floor with other building components (such as doorways and trenches), building utilities or with pile-supported building elements. If these above conditions cannot be met, provide a pile supported slab.

A103003 TRENCHES

Trenches shall be constructed of reinforced concrete with water proof joints and seals to prevent ground water infiltration.

A103004 PITS AND BASES

Pits and bases shall be constructed of reinforced concrete with water proof joints and seals to prevent ground water infiltration.

A103005 FOUNDATION DRAINAGE

A103005 1.1 PERIMETER FOUNDATION DRAINAGE

Perimeter drainage system shall be provided to remove water away from the foundation of the facility and to be deposited in the storm sewerage system of the site. Pipe for the foundation drainage system shall be of the type specified, shall be perforated, and shall be of a size sufficient to remove water from the foundation successfully. Provide one, or a combination of more than one, of the following types of pipe:

a. Corrugated Polyethylene (PE) Drainage Pipe: ASTM F 405, heavy duty, for pipe 3 to 6 inches in diameter inclusive; ASTM F 667 for pipe 8 to 24 inches in diameter. Fittings shall be manufacturer's standard type and shall conform to the indicated specification.
b. Acrylonitrile-Butadiene-Styrene (ABS) Pipe: ASTM D 2751, with a maximum SDR of 35.
c. Polyvinyl Chloride (PVC) Pipe: ASTM F 758, Type PS 46, ASTM D 3034, or ASTM F 949 with a minimum pipe stiffness of 46 psi.

Installation shall include wrapping the pipe with filter fabric sock and careful bedding of the pipe with appropriate fill material to ensure that the pipe does not become odstructed with the bedding material.

A103090 OTHER SLAB ON GRADE

A103090 1.1 BLOCK OR BOARD PERIMETER INSULATION

Provide only thermal insulating materials recommended by manufacturer for perimeter insulation. Provide one of the board or block thermal insulations listed below conforming to the following standards:

a. Cellular Glass: ASTM C 552
b. Extruded Preformed Cellular Polystyrene: ASTM C 578

The thickness of insulation and thermal resistance value shall be sufficient to meet the applicable building code and energy budget for the facility.

-- End of Section --

A10 1.18 New section

SECTION A20

BASEMENT CONSTRUCTION
09/15

A20 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

A20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

A20 1.1.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, ArchitectureUFC 3-220-01, Geotechnical EngineeringUFC 3-301-01, Structural Engineering)

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS Section 31 23 00.00Excavation and Fill
20

A20 1.2 GENERAL REQUIREMENTS

A20 1.2.1 Required Specifications

The Designer of Record shall utilize the following UFGS Specifications for the project specification.

Section 31 23 00.00 20, *Excavation and Fill*

A20 1.2.2 Geotechnical Report

A20 1.2.2.1 Contractor-provided Geotechnical Engineer

The Contractor-provided Geotechnical Engineer is required to be experienced with soil conditions in the region where the project site is located. The geotechnical engineer shall evaluate the RFP data, obtain and evaluate all additional data as required to support the design and construction, and prepare a Geotechnical Report.

A20 1.2.2.2 Subsurface Soils Information

Subsurface soil information, if provided, is included for the contractor’s information only, and is not guaranteed to fully represent all subsurface conditions. The data included in this RFP are intended for proposal preparation and preliminary design only. Contractor shall perform, at his expense, such subsurface exploration, investigation, testing, and analysis as his Designer of Record deems necessary for the design and construction of the foundation system.

All work by the Contractor-provided Geotechnical Engineer at the project location, if required, shall be coordinated with the Contracting Officer and shall not interfere with normal base operations. Prior to the Foundation Work Design submittal, provide a Contractor Geotechnical Report (an editable Adobe Acrobat PDF version on CD and two printed copies) for review and record keeping purposes. The report shall become the property of the Government. Geotechnical reports generated during construction, such as pile driving results and analysis, shall be provided to the Contracting Officer. In addition, provide an editable Adobe Acrobat PDF version and two printed copies for record keeping purposes.

A20 1.2.2.3 Contractor-Provided Geotechnical Report

Submit a written Geotechnical report based upon Government-provided subsurface investigation data and all additional field and laboratory testing accomplished at the discretion of the Contractor's Geotechnical Engineer. The Geotechnical Report must include all requirements listed in UFC 3-220-01, *Geotechnical Engineering*, paragraph entitled "Section 1803 Geotechnical Investigations"; in addition include the following:

a. The project site description, vicinity map and site map.
b. Results of all the field and laboratory testing, whether Government or Contractor-provided.
c. Engineering analysis, discussion and recommendations addressing:
d. Settlement
e. Bearing Capacity
f. Foundation selection and construction considerations (shallow, deep, special); dimensions, and installation

procedures.

g. Site preparation (earthwork procedures and equipment), compaction requirements, building slab preparation (as applicable), soil sensitivity to weather and equipment, and groundwater influence on construction
h. Sheeting and shoring considerations, as applicable
i. Pavement design parameters, actual or assumed, including recommended thicknesses and materials, be for design or for proposed modifications to the RFP provided pavement design only
j. Haul routes and stockpile locations for earthwork, as applicable
k. Calculations to support conclusions and recommendations
l. Recommendations shall be presented on a structure-by-structure basis

The Geotechnical Report shall be signed by a registered Geotechnical Engineer.

The submitted report shall be accomplished by a cover letter identifying any recommendations of the report proposed to be adopted into the design which are interpreted by the Contractor as either conflicting with or being modifications to the Geotechnical or Pavement related requirements of the RFP.

A20 1.2.2.4 Geotechnical Site Data required in Design Drawings

The Contractor's final design drawings shall include the Government-provided subsurface data presented in the RFP as noted below, as well as any additional borings and laboratory test result data performed by the Contractor.

a. Logs of Borings and related summary of laboratory test results and groundwater observations.
b. The locations of all borings shall be indicated on the drawings. The applicable design drawings shall be revised to reference the Contractor’s Geotechnical Report as being a basis for design.

A20 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory construction and system performance shall be via Performance Verification Testing, as detailed in this section of the RFP. Provide special tests and special inspections in accordance with UFGS Section 01 45 00.05 20, *Design and Construction Quality Control*.

A20 1.3.1 Earthwork

Perform quality assurance for earthwork in accordance with IBC Chapter 17 and UFGS Section 31 23 00.00 20. If a registered Professional Engineer is required to provide inspection of excavations and soil/groundwater conditions throughout construction, the Engineer shall be responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Engineer, with the concurrence of the contractor and the Contracting Officer, shall update the excavation, sheeting, shoring, and

dewatering plans as construction progresses to reflect actual site conditions and shall submit the updated plan and a written report (with professional stamp) at least monthly informing the Contractor and the Contracting Officer of the status of the plan and an accounting of Contractor adherence to the plan; specifically addressing any present or potential problems. The Engineer shall be available to meet with the Contracting Officer at any time throughout the contract duration. The contractor shall bear all costs of the Engineer.

A20 1.4 DESIGN SUBMITTALS

Design Submittals shall be in accordance with Z10, General Performance Technical Specifications, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-301-01, *Structural Engineering*, and UFC 3-220-01, *Geotechnical Engineering*.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR shall edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS section Z10, *General Performance Technical Specifications*.

UFGS 31 23 00.00 20 (02315N), *Excavation and Fill*

A20 1.5 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following submittals as a minimum:

Contractor-provided geotechnical report

Controlled fill or backfill material tests

All structural elements necessary for construction

A2010 BASEMENT EXCAVATION

A201001 EXCAVATION FOR BASEMENTS

Excavate for the basement as required in accordance with the requirements of this section and other portions of this RFP.

A201002 STRUCTURE BACKFILL AND COMPACTION

Provide backfill and soil compaction as required in accordance with the requirements of this section and other portions of this RFP.

A201003 SHORING

Provide shoring and sheeting as required in accordance with the requirements of this section and other portions of this RFP. Shoring and sheeting plans shall be signed by the Contractor's Geotechnical/Structural Engineer.

A2020 BASEMENT WALLS

A202001 BASEMENT WALL CONSTRUCTION

Provide basement walls as required in accordance with the requirements of this section and other portions of this RFP.

A202002 MOISTURE PROTECTION

A202002 1.1 BUILT-UP BITUMINOUS WATERPROOFING

A202002 1.1.1 Environmental Conditions

Apply the primers and waterproofing specified herein when the ambient temperature is above 40 degrees F.

A202002 1.1.2 Liquid Asphalt

Deliver bulk liquid asphalt in fully insulated, heated transport tanker vehicles with circulating pump devices. Maintain the temperature of the liquid asphalt between 400 and 450 degrees F during storage, provided the transport and storage time does not exceed 12 hours. If the transport and storage time exceeds 12 hours, lower the temperature to between 300 and 325 degrees F at the time the 12 hours are exceeded. Liquid asphalt shall be used within 36 hours after loading in the transport tanker.

A202002 1.1.3 Materials

a. Bitumen - Asphalt; ASTM D 449, Type I.
b. Bituminous Plastic Cement - ASTM D 4586, Type I for asphalt.
c. Membrane Fabric

The following requirements shall apply:

Felt or Fabric Material	Saturant or Impregnant	Specification
Glass (felt) mat	Asphalt	ASTM D 2178, Type III
Reinforcing glass fabric	Asphalt	ASTM D 1668, Type I

d. Nails - Galvanized roofing nails.
e. Primer - ASTM D 41 for asphalt.
f. Protection Board - ASTM D 517, plain, asphalt plank; ASTM C 208, construction grade building board, 1/2 inch thick, asphalt saturated or coated; ASTM C 726, 7/16 inch thick, covered on one side with waterproof paper or asphalt-saturated felt.

A202002 1.2 ELASTOMERIC SHEET WATERPROOFING

A202002 1.2.1 Environmental Conditions

Do not apply waterproofing during inclement weather or when there is ice, frost, surface moisture, or visible dampness on the surface to receive waterproofing and when ambient and surface temperatures are 40 degrees F or below. The restriction on the application of waterproofing materials when ambient and surface temperatures are below 40 degrees F will be waived if the Contractor devises a means, approved by the Contracting Officer, of maintaining the surface and ambient temperatures above 40 degrees F.

A202002 1.2.2 Butyl Rubber Sheeting

Not less than 60 mils minimum thickness.

A202002 1.2.2.1 Butyl Rubber Sheeting Performance Requirements

a. Thickness Tolerance, ASTM D 412: Plus or minus 10 percent;
b. Specific Gravity, ASTM D 297: 1.20, plus or minus 0.05;
c. Tensile Strength, ASTM D 412: 1200 psi minimum;
d. Tensile Stress at 300 percent elongation, ASTM D 412: 600 psi minimum;
e. Elongation, ASTM D 412: 300 percent minimum;
f. Tear Resistance, Die C, ASTM D 624: 125 pound force per inch (lbf/inch) minimum;
g. Shore A Hardness, ASTM D 2240: Five-second interval before reading; 60 plus or minus 10;
h. Ozone Resistance, ASTM D 1149: No cracks, 7 days - 50 pphm - 100 degrees F, 20 percent elongation;
i. Heating Aging-Accelerated, ASTM D 573: Tensile retention, 60 percent of minimum original elongation retention; 60 percent of minimum original requirement; 7 days, 240 degrees F.
j. Butyl Identification, ASTM D 471, Tricresyl Phosphate Immersion: Maximum volume swell 10 percent, 70 hrs, 212 degrees F;
k. Low Temperature Flexibility, ASTM D 746: No failure at -40 degrees F;
l. Water Absorption, ASTM D 471: +1 percent maximum. 7 days, 158 degrees F;
m. Exposure to Fungi and Bacteria in Soil, Minimum 16 Weeks: Unaffected; and
n. Water Vapor Transmission, 80 Degrees F Permeance, ASTM E 96, Procedure B or BW: 0.15 perms maximum.

A202002 1.2.2.2 Adhesive, Cement, and Tape for Use with Butyl Rubber

Provide as recommended by the butyl rubber waterproofing membrane manufacturer.

A202002 1.2.3 Composite, Self-Adhering Membrane Sheeting

Cold applied composite sheet consisting of rubberized asphalt and cross laminated, high-density polyethylene film. Not less than 60 mils minimum thickness is required.

A202002 1.2.3.1 Composite, Self-Adhering Sheeting Performance Requirements

a. Tensile Strength, ASTM D 412, Die C: 250 psi minimum;
b. Ultimate Elongation, ASTM D 412, Die C: 200 percent minimum;
c. Water Vapor Transmission, ASTM E 96 80 Degrees F Permeance, Procedure B: 0.1 perm maximum;
d. Pliability Degrees F, ASTM D 146: (180 Degrees Bend Over One Inch Mandrel): No cracks at minus -25 degrees F;
e. Cycling Over Crack at Minus 15 Degrees F: Membrane is applied and rolled across two primed concrete blocks with no separation between blocks. Crack opened and closed from zero to 1/4 inch. No effect at 100 cycles;
f. Puncture Resistance, ASTM E 154: 40 lb. minimum;
g. Lap Adhesion at Minimum Application Temperature, ASTM D1876 Modified, 5 lbs/in.(880 N/m);
h. Peel Strength, ASTM D 903: Modified, 9 lbs/in;
i. Resistance to Hydrostatic Head, ASTM D 5385: 231 ft of water
j. Water Absorption, ASTM D 570; 0.1% maximum.

A202002 1.2.3.2 Primer

Asphalt composition, ASTM D 41, or synthetic polymer in solvent as recommended by the membrane manufacturer.

A202002 1.2.3.3 Mastic

Polymer modified asphalt in suitable solvent of trowel-grade consistency and as recommended by the membrane manufacturer.

A202002 1.2.4 Protection Board

Three-dimensional, high impact resistant polymeric grid with woven monofilament drainage fabric bonded to the grid.

A202003 BASEMENT WALL INSULATION

A202003 1.1 BLOCK OR BOARD INSULATION

Provide only thermal insulating materials recommended by manufacturer for the indicated application. Provide one of the board or block thermal insulations listed below conforming to the following standards:

a. Cellular Glass: ASTM C 552
b. Extruded Preformed Cellular Polystyrene: ASTM C 578
c. Unfaced Preformed Rigid Polyurethane and Polyisocyanurate Board: ASTM C 591
d. Faced Rigid Cellular Polyisocyanurate and Polyurethane Insulation: ASTM C 1289
e. Type I Aluminum Foil on both major surfaces. Class 1 - Non-reinforced core foam.

A202003 1.2 BLANKET INSULATION

ASTM C 665, Type I, blankets without membrane coverings; with a thermal resistance value, which will be sufficient to meet the applicable building code and energy budget for the facility. The insulation material shall not contain asbestos materials.

A202003 1.2.1 Recycled Materials

Provide Thermal Insulation containing recycled materials to the extent practicable, provided the material meets all other requirements of this section. The minimum required recycled materials content by weight are:

Rock Wool: 75 percent slag

Fiberglass: 20 to 25 percent glass cullet

A202004 INTERIOR SKIN

Comply with Section C30, *Interior Finishes*.

-- End of Section --

SECTION B10

SUPERSTRUCTURE
09/15

B10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

B10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

B10 1.1.1 Government Standards

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, ArchitectureUFC 3-301-01, Structural Engineering)
UFC 4-023-03	Design of Buildings to Resist Progressive Collapse

B10 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory construction and system performance shall be via Performance Verification Testing, as detailed in this section of the RFP. Provide special tests and special inspections in accordance with UFGS Section 01 45 00.05 20, *Design and Construction Quality Control*.

B10 1.3 DESIGN SUBMITTALS

Design submittals shall be in accordance with Z10, General Performance Technical Specifications, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-101-01, *Architecture*, and UFC 3-301-01, *Structural Engineering*.

B10 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General*

Performance Technical Specifications. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following submittals as a minimum:

All structural elements necessary for construction of the superstructure.

B1010 FLOOR CONSTRUCTION

B101001 STRUCTURAL FRAME

Structural frame elements may include columns, girders, beams, trusses, joists, moment frames, shear walls, and bracing. See Section B20, *Exterior Enclosure*, for additional requirements for exterior walls used as load-bearing walls or shear walls.

B101002 STRUCTURAL INTERIOR WALLS

Provide structural interior walls as required in accordance with the requirements of this section and other portions of this RFP. See Section C10, *Interior Construction*, for additional requirements.

B101003 FLOOR DECKS AND SLABS

If required, provide floor decks as required in accordance with the requirements of this section and other portions of this RFP.

B101005 BALCONY CONSTRUCTION

Design and construct exterior balconies to drain and with the top of the balcony high-point below the interior floor elevation as required for flashing.

B101006 RAMPS

Provide ramps as required in accordance with the requirements of this section and other portions of this RFP.

B101007 FLOOR RACEWAY SYSTEMS

See Section D50, Electrical, for floor raceway systems.

B1020 ROOF CONSTRUCTION

B102001 STRUCTURAL FRAME

Structural frame elements may include columns, girders, beams, trusses, joists, moment frames, shear walls, and bracing. See Section B20, *Exterior Enclosure*, for additional requirements for exterior walls used as load-bearing walls or shear walls.

B102002 STRUCTURAL INTERIOR WALLS

Provide structural interior walls as required in accordance with the requirements of this section and other portions of this RFP. See Section C10, *Interior Construction*, for additional requirements.

B102003 ROOF DECKS AND SLABS

Provide roof deck as required in accordance with the requirements of this section and other portions of this RFP.

B102004 CANOPIES

Provide canopies as required in accordance with the requirements of this section and other portions of this RFP.

-- End of Section --

SECTION B20

EXTERIOR ENCLOSURE
09/15

B20 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

B20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

B20 1.1.1 Industry Standards and Codes

NATIONAL LUMBER GRADES AUTHORITY (NLGA)

B20 1.1.2 Government Standards

Military Handbook 1013/1A, Design Guidance for Physical Security of Facilities

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s): UFC 3-101-01, Architecture)
UFC 1-200-02	High Performance and Sustainable Buildings

B20 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory exterior enclosure system performance must be via Performance Verification Testing, and by field inspection as detailed in this section of the RFP. Provide special tests and special inspections in accordance with UFGS Section 01 45 00.05 20, *Design and Construction Quality Control*. The Contractor must pay the cost of all testing.

B20 1.2.1 Required Brick Masonry Testing and Field Samples

a. Where field testing is required, masonry strength must be determined in accordance with ACI 530.1.

b. Field Samples: Masonry Panel Requirements - At the job site submit for approval by the Designer of Record, a sample masonry panel minimum 8 feet (2.4 meters) long by a minimum of 4 feet (1.2 meters) high. Actual Sample size will be determined by number of components in the sample wall but provide a span of at least 4 feet (1.2 meters) of uninterrupted brickwork and 2 feet (.6 meters) above wall openings. The approved sample must exhibit the standard for workmanship and materials for the project. The sample panel must include brick coursing, bond, weep holes, flashing, thickness, anchors, joint reinforcing, wall ties, rigid-board insulation, intersection of walls, bond beams, expansion and control joints, and tooling of joints, range of color, texture of masonry, and mortar color; or cold-formed steel framing, insulation, fiberglass-faced gypsum sheathing, air barrier, moisture barrier/vapor retarders, exterior enclosure barrier connections to adjoining construction, sealing of exterior enclosure barrier penetrations, sealant, masonry ties and anchors, and tooling of joints, the range of color and texture of brick veneer, and the color of mortar. The sample panel must be protected from damage and must remain at the site until masonry work is complete and approved, at which time the panel must be removed from the site. If there are windows or curtain walls in the project which interface with the masonry, a cut-away sample window or curtain wall mock-up must be installed in the masonry field panel, with all accessories, finishes, and trim (see B20 1.2.4 and 1.2.5). Masonry work must match the approved sample.

B20 1.2.2 Air Barrier Field Sample

Designate a portion of the project that reveals the various edge, seam, transition, and penetration conditions that the air barrier is exposed to. Determine this location with the Contracting Officer and obtain approval of the sealing methods employed on the project from the air barrier Manufacturer. Leave sample area exposed to view as long as practical to serve as a construction standard and comparison of future air barrier construction on the project. Before construction covers the sample area, provide detailed photographs of the air barrier details for future reference.

B20 1.2.3 Air Barrier Performance

Provide air barrier inspection on all projects and air barrier performance testing when required in RFP Part 3, section B20.

B20 1.2.3.1 Air Barrier Inspection

Coordinate all subcontractors that provide part of the air barrier construction to provide an air tight barrier. Review the air barrier prior to being covered by subsequent construction to confirm that the air barrier complies with the following requirements;

a. Prior to applying an air barrier, confirm that the substrate complies with conditions required by the applied air barrier material manufacturer.
b. Air barrier must create a continuous barrier, without gaps, "fish mouths", holes, unsealed seams, or unsealed penetrations.
c. Air barrier components are compatible and capable of being permanently connected to form an air tight barrier.
d. Construction of the air barrier complies with air barrier design as indicated in the Basis of Design and exterior enclosure barrier drawings.
e. Air barrier is installed in accordance with manufacturer's standard details available on the Air Barrier Association of America (ABAA) website named "Air Barrier Materials, Components, Assemblies & Systems" and found at the following web link; http://www.airbarrier.org/materials/assemblies_e.php

B20 1.2.3.2 Air Barrier Performance Testing

Provide air barrier testing and repair as follows (coordinate with infrared thermal testing):

a. Provide a testing plan as a part of the Commissioning Plan and notify the Contracting Officer 7 working days before the testing will take place. Do not test the building until verifying that the continuous air barrier is in place and installed without failures in accordance with installation instructions so that repairs to the continuous air barrier, if needed to comply with the required air leakage rate, can be done in a timely manner.

   Also coordinate building access during the test with the Contracting Officer. Perform pretest inspection with all parties involved in the test and possible repairs of the building enclosure. Record pretest conditions and utilize pictures to assist in the documentation.
b. DOR must utilize UFGS 07 05 23, "Pressure Testing an Air Barrier System for Air Tightness" and Contractor must perform testing as described in that specification. Where conflicts exist between the UFGS 07 05 23 and this performance specification, UFGS 07 05 23 shall govern. The air leak flow rate must not exceed 0.25 CFM at 75 Pa per square foot (0.076 cmm 75 Pa per square meter) of building enclosure area including roof or ceiling, walls and floor as provided by the DOR.

   Method 1: This test consists of measuring the flow rates required to establish 12 positive and 12 negative building pressures from at least 25 Pa to at least 50 Pa.

At least 12 bias pressure readings must be taken across the building enclosure and averaged over 5 seconds each before and after the test. None of these readings must exceed 30% of the minimum test pressure.

Method 2: this test consists of measuring the flow rates required to establish 12 positive building pressures from at least 50 Pa to at least 75 Pa. At least 12 bias pressure readings must be taken across the building enclosure and averaged over 5 seconds each before and after the test. None of these readings must exceed 20% of the minimum test pressure.

The test results must be either pass or fail. Provide the theoretical size of the opening that leaks the same amount as the building enclosure at 75 Pa, to facilitate the search for leaks and repair of the exterior enclosure.

c. Provide infrared thermography to determine air leakage paths if facility fails to retain the required air pressure in the test above. Utilize infrared cameras with a resolution of 0.1 degree C or better.

Prerform infrared thermography in accordance with ISO 6781:1983 and ASTM C1060-90(1997). Determine air leakage pathways in accordance with ASTM E1186-03 *Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems*, and perform corrective work as necessary to achieve the whole building air leakage rate specified.

Modify construction to stop identified air leakage until target 0.25 cfm/ft2 is reached. Correct air path leaks at the source of the leak, do not use sealant to close air leakage paths that are required to be opened for maintenance of the facility such as fixtures, switches covers, receptacle covers, access doors,...etc.

d. Air leaks must be sealed in the following order of priority:1. Top of the building. These include attics, roof/wall intersections, penthouse doors and walls, HVAC equipment.

2. Bottom of the building. These include ground floor access doors and inspection hatches, exhaust and air intake vents, service penetrations of enclosure, crawl spaces.

3. Vertical shafts. These include gasket stairwell fire doors, fire hose cabinets and recessed toilet accessories connected to vertical shaft, vertical and horizontal utility penetrations in service rooms, elevator rooms and shafts.

4. Exterior walls. These include weather strip doors and windows, exhaust fans and ducts, service penetrations, electrical receptacles, wall base.

B20 1.2.4 Thermal Envelope Performance Testing (Infrared Thermography)

Where required in RFP Part 3, provide infrared thermal testing and repair as follows (coordinate with air barrier testing):

a. Test the building envelope using Infrared Thermography technology. The thermography testing must be completed in accordance with the requirements of ASTM C1060 and ISO 6781. The Contracting Officer will witness the testing. Testing must occur just before the building air tightness test. Testing must also occur during the air tightness test so that areas of building air leaks are detected. If the building air tightness test is failed, thermographic testing must be repeated just before and during subsequent air tightness tests until the air tightness test is successful.
b. Thermography Test Procedures: Submit detailed test procedures indicating the test apparatus, the test methods and procedures, and the analysis methods to be employed not later than 60 days after Notice to Proceed.
c. Thermography Test Report: Provide a report. The report must include thermographs in color and a color temperature scale to define the temperature indicated by the various colors. The report must identify the high temperature reading, the outdoor air temperature, the building indoor air temperature, and the wind speed and direction. The report must note any areas of compromise in the building envelope, and must note all actions required and taken to correct those areas.
d. Final Test: Final thermography test report must demonstrate the problem areas have been corrected. Submit the complete test and analysis for review and approval.

B20 1.2.5 Required Records for Concrete Wall Panels

a. Cast-in-place - Submit to DOR mandatory batch ticket information as ASTM C 94 for each load of ready-mixed concrete.
b. Submit to DOR commercial testing results in accordance with PCI MNL-117 and as required in paragraph entitled "Sampling and Testing for Precast"

B20 1.2.6 Precast Concrete Wall Panel Surface Finish Sample

Submit to DOR a concrete wall panel sample 12 inches (300 mm) by 12 inches (300 mm) by approximately 1 1/2 inches (38 mm) in thickness, to illustrate quality, color, and texture of both exposed-to-view surface finish and finish of panel surfaces that will be concealed by other construction. Obtain initial approval of color and texture from DOR prior to submission of sample panels.

B20 1.2.6.1 Manufacturing Plant Sampling And Testing for Precast

Plant Quality Control - PCI MNL-117 for PCI enrolled plants. Where panels are manufactured by specialists in plants not currently enrolled in the PCI "Quality Control Program," provide a product quality control system in accordance with PCI

MNL-117 and perform concrete and aggregate quality control testing using an approved, independent commercial testing laboratory. Submit test results to the Contracting Officer.

a. Aggregate Tests: ASTM C 33. Perform one test for each aggregate size, including determination of the specific gravity.
b. Strength Tests: ASTM C 172. Provide ASTM C 39 and ASTM C 31/C 31M compression tests. Perform ASTM C 143 slump tests. Mold six cylinders each day or for every 20 cubic yards (15 cubic meters) of concrete placed, whichever is greater. Perform strength tests using two cylinders at 7 days and two at 28 days. Cure four cylinders in the same manner as the panels and place at the point where the poorest curing conditions are offered. Moist cure two cylinders and test at 28 days.
c. Changes in Proportions: If, the compressive strength falls below that specified, adjust the mix proportions and water content and make necessary changes in the temperature, moisture, and curing procedures to secure the specified strength. Notify the Contracting Officer of all changes.
d. Strength Test Results: Evaluate compression test results at 28 days in accordance with ACI 214 using a coefficient of variation of 20 percent. Evaluate the strength of concrete by averaging the test results (two specimens) of standard cylinders tested at 28 days. Not more than 20 percent of the individual tests must have an average compressive strength less than the specified ultimate compressive strength.

B20 1.2.6.2 Acceptable Appearance

Refer to *Architectural Precast Concrete*by the Prestressed Concrete Institute, in the "Acceptability of Appearance" paragraph for reasons to reject precast panels. Panels in place may be rejected for any one of the product defects or installation deficiencies remaining after repairs and cleaning have been accomplished. "Visible" means visible to a person with normal eyesight when viewed from a distance of 20 feet (6 meters) in broad daylight.

B20 1.2.7 Window Sample Mock-Up

a. Provide mock-up of one (1) typical combination window unit to be used within the project and conduct a field mock-up test in strict compliance with AAMA 502 method A and method B. Each opening will be tested to achieve performance of ASCE 7-02 calculated requirements (PSF or Kg/m2) for water resistance, which must not exceed .667 % of the products capable water based on AAMA 101/I.S.2. Allowable rates of air leakage for field testing must be 1.5 times applicable AAMA 101/I.S.2 rate for the Product Type and Performance Class.
b. Opening is to be tested under "Quality Control" testing by a designated independent testing agency.

1) Schedule mock-up installation sufficiently in advance of

need to allow adequate time for cure of sealants, testing and reconstruction, if needed, without delaying the project.

2) Build mock-up in building enclosure wall in location selected by Owner and Architect.

3) Modify mock-up construction and perform additional tests as required to achieve specified minimum acceptable results. If corrections are not adequate, construct new mock-up, at written direction of Owner and Architect. Co-ordinate construction of mock-up with other involved trades.

4) Approved mock-ups may become part of completed Work if undisturbed at time of Substantial Completion.

5) Flood test Mock-up window subsill and obtain approval of DOR prior to installing window unit.

B20 1.2.8 Curtain Wall Systems Field Sample and Testing

a. At the job site submit for approval by the Designer of Record, a sample curtain wall installation which may be a cut-away portion of a curtain wall, if appropriate, to show the construction, the workmanship, tie-in to building, infiltration and moisture barriers, wrap, flashing, head, window unit installation where required, sill, lintel if required, interior and exterior trim, anchors and reinforcing, and sealants.

b. Provide mock-up of (1) designated Curtain Wall System unit to be used in conducting a field mock-up test in strict compliance with AAMA 503 method A and method B. Each opening will be tested to achieve performance of ASCE 7-05 calculated requirements (PSF or Kg/m2) for water resistance, which must not exceed the derived water expectation of 0 infiltration at the calculated Design Pressure. Allowable rates of air leakage for field testing must be .30 CFM/Ft2 of wall area test specimen. Performance test at 6.24 PSF (30.3 Kg/m2) allows .30 cfm/ft2. Opening is to be tested under "Quality Control" testing by a designated independent testing agency.

1) Schedule mock-up installation sufficiently in advance of need to allow adequate time for cure of sealants, testing and reconstruction, if needed, without delaying the project.

2) Build mock-up in building enclosure wall in location selected by DOR.

3) Modify mock-up construction and perform additional tests as required to achieve specified minimum acceptable results. If corrections are not adequate, construct new mock-up, at written direction of DOR. Co-ordinate construction of mock-up with other involved trades.

4) Approved mock-ups may become part of completed Work if undisturbed at time of Substantial Completion.

The sample curtain wall must be protected from damage and must remain

at the site until curtain wall construction work is complete and approved, at which time the panel must be removed from the site. On projects where the curtain wall interfaces with masonry walls, a cut-away sample curtain wall must be installed with the masonry sample panel. Curtain wall installations must match the approved sample.

Water Penetration: No water penetration must occur when the wall is tested in accordance with ASTM E 331 at a differential static test pressure of 20 percent of the inward acting design wind pressure as specified, but not less than 15 psf (80 Kg/m2). Make provision in the wall construction for adequate drainage to the outside of water leakage or condensation that occurs within the outer face of the wall. Leave drainage and weep openings in members and wall open during test.

B20 1.3 DESIGN SUBMITTALS

Design submittals must be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-101-01, *Architecture*and UFC 3-301-01, *Structural Engineering*.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR must edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS section Z10, *General Performance Technical Specifications*.

UFGS 08 34 16.10, *Steel Sliding Hangar Door*

UFGS 08 34 16.20, *Vertical Lift Fabric Door*

B20 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) must approve the following submittals as a minimum;

Shop drawings for reinforcing steel in masonry walls, doors, door hardware, windows, storefront, curtainwall, glazing, paint, exterior enclosure barrier systems, and visible exterior materials.

All structural elements necessary for construction.

B20 1.4.1 Manufacturer's Verification Inspection Documentation for Galvanized Steel

Manufacturer's verification inspection documentation must be submitted for all galvanized steel in accordance with ASTM A123, ASTM A 153, and ASTM A 653.

B20 1.4.2 Field Inspection of Field-erected Concrete Panels

a. Perform field inspection of panel welded connections. Furnish the services of AWS-certified welding inspector for erection inspections. Welding inspector must visually inspect all welds and identify all defective welds.
b. The DOR must be notified in writing of defective welds, bolts, nuts and washers within 7 working days of the date of inspection. All defective connections or welds must be removed and re-welded or repaired as required by the DOR.

B20 1.4.3 Sustainable Construction Submittals

Submit sustainable construction submittals in accordance with UFGS 01 33 29.05 20 Sustainability Reporting for Design-Build.

B2010 EXTERIOR WALLS

Provide exterior wall construction that consists of exterior skin system of non-structural outside face elements with rain-screen back-up wall systems that include; flashing (embedded, exposed, and thru-wall), a water resistive barrier, moisture barrier/ vapor retarder (if required), air barrier, and insulation systems with interior skin system materials to provide a protective finish on the inside face of exterior walls. Provide all components necessary to for a shingled water resistive barrier to direct water that would penetrate the wall to be directed to the outside of the wall. Provide exterior enclosure components and barriers in accordance with UFC 3-101-01, *Architecture*.

Design all work to comply with UFC 3-101-01, *Architecture*, and UFC 3-301-01, *Structural Engineering*, and the following requirements:

a. Vapor Pressure and Hygrothermal Analysis - Perform a job specific vapor pressure and hygrothermal analysis in accordance with UFC 3-101-01, *Architecture*. The conclusion of the analysis must indicate if a moisture barrier/ vapor retarder is required, the appropriate locations of needed moisture barrier/ vapor retarder, and anticipated dew-point locations in the exterior enclosure during different critical times of the year.
b. Wind Loads - Provide wind load calculations for exterior cladding in accordance with UFC 1-200-01 and UFC 3-301-01 with comparative analysis of the cladding system to be provided.
c. Water Penetration - No water penetration must occur at a pressure of 8 psf (39 Kg/m2) of fixed area when tested in accordance with ASTM E 331.
d. Insulating Value – Comply with UFC 3-101-01, Architecture for the ASHRAE requirements defining the minimum insulating value of the complete wall system.

B201001 EXTERIOR CLOSURE

B201001 1.1 MASONRY VENEER EXTERIOR WALL CLOSURE COMPONENTS

B201001 1.1.1 General Requirements

a. The masonry veneer includes the non-load bearing exterior walls of the structure, and also includes colored mortar, special shapes such as sills, headers, trim units and copings of brick masonry, precast concrete, concrete masonry units, or other

approved materials. The veneer must be tied to the backup wall system with a system that allows the veneer to move independently of the backup wall system, while being structurally supported. Allow for expansion and contraction of the veneer without cracking the exterior material.

b. Use running bond, tooled concave joints and full head joint weeps at 24 inches (610 mm) o.k. in the course immediately above the base flashing. Where rowlocks are permitted, slope rowlocks and project not less than 1/2 inch (13 mm) beyond the face of the wall to form a wash and drip. Where required, provide colored mortar conforming to ASTM C270. Provide special shapes where required.

c. Locate expansion/control joints and seal with proper backing material and ASTM C 920 polyurethane sealant, or preformed foam or rubberized expansion joint closure. Conform to UFC 3-101-01 and BIA Technotes 18, 18A. Match joint color of the brick, unless DOR directs otherwise.

d. Conform to ACI 530.1 for masonry veneer installation, including cold weather construction. Antifreeze admixtures are not to be used.

e. Clean the masonry in accordance with manufacturer's instructions and BIA Technote 20.

f. Utilize BIA Technical Notes to design, detail, and construct brick masonry walls. This PTS section amends the BIA documents and takes precedence over similar BIA requirements. Substitute directive language in the place of BIA suggestive language as required in PTS Section Z10, *General Performance Technical Specifications*. The results of these wording substitutions change this document to required procedures.

B201001 1.1.2 Face Brick

a. Brick Masonry Appearance - Do not change source or supply of materials after brick manufacturing work has started. Blend all brick to produce a uniform appearance when installed. An observable "banding" or "layering" of colors or textures caused by improperly mixed brick is unacceptable.

b. Brick Type – Provide brick in accordance with ASTM C216, Grade SW, type FBX. Test rating of ASTM C67 must be "Not effloresced".

B201001 1.1.3 Split Faced or Ground Faced Masonry

ASTM C 90. If required, provide split faced or ground faced units, or split-ribbed units or scored-faced units.

B201001 1.1.4 Cast Stone Trim Units

a. Cast stone must be the product of a manufacturer regularly engaged in the manufacture of architectural cast stone (precast concrete building unit) products. Meet or exceed the requirements of ASTM C 1364.

b. Trim units of cast stone must include sills, fascia, header units, copings and other trim units as required by the approved design

B201001 1.1.5 The Wall Cavity

Comply with UFC 3-101-01 and BIA Technical Notes 21A, 21B, 21C, 28B.

B201001 1.1.6 Through-Wall Flashing Components

Provide through-wall flashing over all openings, spandrels, shelf angles, lintels, and built-in structural steel members. Provide through-wall flashing below all openings, parapets copings, sills, and at the base of the wall. Provide a method of weeping water collected by the through-wall flashing to the outside of the wall.

a. Incorporate weep holes to align with through-wall flashing in cavity wall construction as required by UFC 3-101-01 and BIA Technotes. Install flashing according to BIA Technotes 7, 7A, 7B, 21A, 21B, 21C, 28B, and SMACNA figures 4-1A and 4-1B. Extend metal drip edge flashing beyond the wall plane using a 1/4 inch (6 mm) preformed 45 degree angle turn down.
b. Flashing material must be as required by UFC 3-101-01 and the following: Provide flashing of 7 ounce copper flashing with a 3 ounce bituminous coating on each side or a fiberglass fabric bonded on each side of the copper sheet. Sixteen (16) ounce uncoated copper, 28 gauge Type 302 or 304 stainless steel is also acceptable. 'Flexible membrane flashing, plastic or PVC-based membrane flashing is prohibited. Lap and seal turndown solid metal drip edge flashing to through- wall flashing. Refer to "Flashing" in this section to find requirements for non-through-wall flashing.
c. Incorporate the through-wall flashing in the water resistive barrier and seal joints to flashing to form a shingled effect and direct water to the exterior to the exterior enclosure and away from back-up wall assembly.
d. Where flashing is not continuous, such as at masonry wall opening heads and sills, extend flashing four inches beyond each side of the opening and turn up ends to form a pan and prevent water from reentering the wall cavity.

B201001 1.1.7 Reinforcing in Veneer Layer

Reinforcing in the veneer layer must be galvanized in accordance with ASTM A 123/A123M, ASTM A153/A153M, or ASTM A653/A653M, Z275 (G90) coating, and be of sufficient size to eliminate damage to the veneer layer from wind and other live and dead loads imposed on the veneer layer.

B201001 1.2 METAL WALL PANEL EXTERIOR CLOSURE

B201001 1.2.1 General Wall Panel Requirements

a. Factory Color Finish – Provide panels with a factory applied, baked coating to the exterior and interior of metal wall panels and metal accessories. Exterior finish topcoat must be of 70 percent polyvinylidene fluoride (PVDF) resin with not less than 0.8 mil dry film thickness (DFT). Provide exterior primer that is standard with panel manufacturer but not less than 0.8 mil dry film thickness (DFT). Provide factory applied 70 percent PVDF clear coating of 0.8 mil DFT over the color topcoat and

edge coating for projects within 300 feet (91 meters) of a water shoreline or industrial environment. Field apply 70 percent PVDF clear coat to unfinished panel edges or field cut panels. Interior finish exposed to sun or rain must be the same coating and DFT as the exterior coating.

b. Wall system and attachments must resist wind loads as determined by ASCE 7, with a factor of safety appropriate for the material holding the anchor. Maximum deflection due to wind on aluminum wall panels must be 1/60. Limit maximum deflection due to wind on steel wall panels and girts behind aluminum or steel wall panels to 1/120 of their respective spans, except that when interior finishes are used limit the maximum allowable deflection to 1/180 of their respective spans. The structural performance test methods and requirements of the wall system and attachments must be in accordance with ASTM E 1592.

c. Conformations - Non-insulated steel or aluminum wall panels must have configurations for overlapping adjacent sheets or interlocking ribs for securing adjacent sheets and fastened to framework using exposed or concealed fasteners, as specified. Provide sheets of sufficient length to cover the entire height of any unbroken wall surface when the length of run is 30 feet (9 meters) or less. Design wall systems with provisions for expansion and contraction. Where required, provide series 305 stainless steel fasteners factory finished to match panels.

d. Shape - Standard V-beam or boxed beam type having 5 to 8 inch (125 mm to 200 mm) pitch for steel panels or 4 to 8 inch (100 mm to 200 mm) pitch for aluminum panels, and 1.5 inch (38 mm) overall depth, exclusive of coating. Other shapes may be considered if approved by the DOR.

B201001 1.2.2 Steel Wall Panels

a. Material and Coating - Form sheets from steel conforming to ASTM A 653/A 653M, Structural Grade 40, galvanized coating conforming to ASTM A 924/A 924M, Class G-90; aluminum-coated steel conforming to SAE AMS 5036; or steel-coated with aluminum-zinc alloy conforming to ASTM A 792/A 792M, except that coating chemical composition must be approximately 55 percent aluminum, 1.6 percent silicon, and 43.4 percent zinc with minimum coating weight of 0.5 ounce per square foot.

b. Gage - Minimum 22 U.S. Standard Gage for wall panels, but in no case lighter than required to meet maximum deflection requirements specified.

B201001 1.2.3 Aluminum Wall Panels

a. Material and Coating - Form sheets of Alloy 3004 or Alclad 3004 conforming to ASTM B 209 having proper temper to suit respective forming operations.

b. Thickness - Minimum 0.032 inch (0.81 mm) nominal, but in no case thinner than that required to meet maximum deflection requirements specified.

B201001 1.2.4 Insulated Aluminum or Steel Wall Panels

Insulated wall panels must be steel or aluminum factory-fabricated units with insulating core between metal face sheets securely fastened

together and uniformly separated with rigid spacers. Provide factory color finish on panels. Insulation must be compatible with adjoining materials and capable of retaining its R-value for the life of the metal facing sheets; and unaffected by extremes of temperature and humidity. The assembly must have a flame spread rating not higher than 25, and smoke developed rating not higher than 50 when tested in accordance with ASTM E 84. Panels must be not less than 8 inches (200 mm) wide and must be in one piece for unbroken wall heights.

Provide wall panel edge configurations with interlocking ribs for securing adjacent panels. Utilize factory fabricated corners and trim pieces at intersections with other materials. Fasten wall panels to framework using concealed fasteners. Install in accordance with DOR-approved shop drawings and manufacturer's recommendations.

a. Insulated Steel Panels - Zinc-coated steel conforming to ASTM A 653/A 653M; or Aluminum-zinc alloy coated steel conforming to ASTM A 792/A 792M, AZ 55 coating. Uncoated wall panels must be 0.024 inch (0.61 mm) thick minimum.
b. Insulated Aluminum Panels - Alloy conforming to ASTM B209, temper as required for the forming operation, minimum 0.032 inch (0.81 mm) thick.

B201001 1.3 STUCCO EXTERIOR WALL CLOSURE

B201001 1.3.1 Portland Cement Plaster

ASTM C150, gray Portland cement Type II with 1/2 inch (13 mm) maximum chopped alkali resistant fiberglass strands, minimum 1.5 percent by weight to cement; 1 1/2 pounds (.68 kg) per sack of cement. Lime must conform to ASTM C206, Type S. Utilize stainless steel or zinc corner beads, J-beads and other accessories for the system.

a. Unless specifically deleted, utilize an acrylic admixture or coating to give additional moisture suppression to control fungus growth for the system.
b. Sand aggregate for job-mixed base coat and job-mixed finish coat stucco must conform to ASTM C897.
c. Sand for Finish Coats: Natural color and graded within the limits shown above for basecoats, except that the sand must pass the No. 8 sieve, and for smooth finish the sand must pass the No. 30 sieve.
d. Mix scratch coat in proportion of one part by volume Portland cement, 3/4 to 1 1/2 parts by volume hydrated lime and 2 1/2 to 4 parts sand (volume of sand per sum of cement and lime). Mix brown coat in proportion of one part by volume Portland cement, 3/4 to 1 1/2 parts by volume hydrated lime and 3 to 5 parts sand (volume of sand per sum of cement and lime). Mix proportions can vary depending on climate and application variations, with the approval of the DOR.
e. Portland Cement Stucco Finish Coat 3 to 5 parts sand (volume of sand per sum of cement and lime).
f. Portland cement plaster application must be in accordance with ASTM C 926. Furring and lath application must be in accordance with ASTM C 1063.
g. Bonding Agents: ASTM C 932. Provide for exterior applications

to masonry or concrete substrates.

h. Provide water resistive barrier under stucco in accordance with manufacturer’s recommendations and code requirements.

B201001 1.4 EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

EIMA TM 101 and 01 EIMA TM 101.86. Refer to the RFP Part 3 Project Program to determine if EIFS is used as the non-primary or the primary exterior finish material for the project. Job-fabricate the exterior insulation and finish system (EIFS) covering consisting of sheathing, water resistive barrier, moisture drainable insulation board system, reinforcing fabric, base coat, finish coat, adhesive, primer, accessories, flashing, sealant, and mechanical fasteners. The system components must be compatible with each other and with the substrate as recommended or approved by, and the products of, a single manufacturer regularly engaged in furnishing Exterior Insulation and Finish Systems. Install all materials using an applicator trained and approved by the system manufacturer in accordance with DOR-approved shop drawings and manufacturer's recommendations. Provide EIFS Class PB or Class PM. Do not use Class PB EIFS in first floor, high traffic areas, or in areas where pedestrians congregate without at least one layer of 20 ounce (567 grams) reinforcing fabric mesh. Use 1/8 inch (4 mm) minimum thickness for PB finish system. Color of the EIFS finish must be consistent, with no variation noticeable to the DOR. Seal all joints in EIFS in accordance with ASTM C 1481 and as recommended by the manufacturer. Furnish manufacturer's standard warranty for the EIFS. Provide warranty directly to Government and cover a period of not less than 5 years from date Government accepted the work.

B201001 1.4.1 EIFS System Components

a. Glass Mat Gypsum Sheathing Board - Conform to ASTM C 1177/C 1177M. Nail Pull Resistance: No less than 120 lb (54.4 Kg) when tested in accordance with ASTM C 473.

b. Mechanical Fasteners - Corrosion resistant and as approved by EIFS manufacturer. Select fastener type and pattern based on applicable wind loads and substrate into which fastener will be attached, to provide the necessary pull-out, tensile, and shear strengths.

c. Thermal Insulation - Drainable type. Do not use any layer of insulation less than 3/4 in (19 mm) thick. The maximum thickness of all layers mustl not exceed 4 in (101 mm). Insulation Board must be certified as aged, in block form, prior to cutting and shipping, a minimum of 6 weeks by air-drying, or equivalent. Insulating material must conform to ASTM C 578, Type I or IV, as recommended by the EIFS manufacturer and treated to be compatible with other EIFS components.

d. Reinforcing Fabric - Reinforcing fabric mesh must be alkali-resistant, balanced, open weave, glass fiber fabric made from twisted multi-end strands specifically treated for compatibility with the other system materials, and comply with EIMA TM 105.01 and as recommended by EIFS manufacturer.

B201001 1.5 CONCRETE EXTERIOR WALL CLOSURE

B201001 1.5.1 Precast Concrete Wall Panels:

ACI 211.1 and ACI 301. PCI MNL-116 or PCI MNL-117. Concrete must have

a minimum 28-day compressive strength of 4000 psi (281 Kg/cm2). Air content of plastic concrete must be between 4 and 6 percent air by volume. Provide a dosage of air entraining agent, which will produce 19 plus or minus 3 percent air in a 1 to 4 by weight standard sand mortar in accordance ASTM C 185. Provide aggregate in accordance with ASTM C 33. Seal the panel joints with fully loaded and tooled sealant joints that are properly sized, shaped, and placed against manufacturer approved backing material. Sealant material thickness must not be less than 1/4 inch (6mm).

For rain screen precast panel wall systems with back-up wall construction, provide sealed face joints that allow moisture to be drained from the wall cavity behind the precast panels via weeps. Provide flashing and water/ moisture resistant barriers to direct water from the wall cavity to the outside of the building. Locate weeps where cavity is obstructed such as above through-wall flashing, at head and sill flashing above and below windows, above door flashings, and wall base flashing.

For barrier wall precast panel wall systems without back-up wall construction, provide a two stage drained joint system on all precast panels joints. Design the two staged drained joint system to provide the following;

a. Locate all sealant beads on the exterior side of the backer rod. Align placement of the exterior sealant bead with the exterior surface of the precast panel and space the placement of the interior sealant bead as required below but no less than 3 inches (75 mm) from the face of the panel to the face of the interior tooled sealant bead.
b. Space sealant beads as far apart as possible but provide no less than 1 inch (25mm) clear air space between the exterior seal backer rod and the tooled interior sealant bead.
c. Form minimum of 1/2 inch (12mm) weep holes to facilitate drainage in the vertical sealant joints. Attach a bead of sealant to the interior vertical sealant bead with an outward slope and a drop in height of at least 4 inches (100mm) to form the drainage plane for the weep opening.
d. Locate weeps as necessary to allow complete drainage of water from the two stage air/ vent space. Provide weeps at obstructions in the air/ vent space such as through wall flashing, horizontal panel joints, head and sill flashing above and below windows, above door flashing, and wall base flashing.

Minimize cracking potential of precast concrete elements by implementing expansion and control joints in the precast assembly. Comply with the following;

a. Exposed Aggregates - In addition to the above aggregate, facing mixture aggregate, and aggregate for homogeneous panels with exposed aggregate finish, must be crushed stone.
b. Cement - ASTM C 150.
c. Admixtures - ASTM C 260 for air-entraining admixtures. Other admixtures: ASTM C 494. Certify that admixtures are free of chlorides.
d. Reinforcement - ACI 301.

e. Inserts - ASTM A 47, Grade 32510 or 35018, or may be medium strength cast steel conforming to ASTM A 27/A 27M, Grade U-60-30. Where exposed to moisture, provide inserts hot-dip galvanized after fabrication in accordance with ASTM A 153/A 153M.

f. Embedded Plates - ASTM A 36/A 36.

g. Flashing Reglets - Fabricate of sheet metal, open-type with continuous groove 1-1/8 inches (28 mm) deep minimum by 3/16 inch (5 mm) wide at opening and sloped upward at 45 degrees. Top surface must have toothed lip section to anchor upturned edge of metal snap-lock counter flashing when inserted. Provide stainless steel sheet metal, 0.011 inch (0.28 mm) minimum thickness, ASTM A 167, Type 302 or Type 304, Number 2D finish, soft temper.

h. Clip Angles - ASTM A 36/A 36M steel, galvanized after fabrication in accordance with ASTM A 153/A 153M.

i. Ferrous Casting Clamps - ASTM A 47, Grade 32510 or Grade 35018 malleable iron or cast steel, or ASTM A 27/A 27M, Grade U-60-30, cast steel casting, hot-dip galvanized in accordance with ASTM A 153/A 153M.

j. Threaded Fasteners – Provide galvanized machine bolts, washers and, when required, nuts.

1) Bolts: ASTM A 449, 3/4 inch (19 mm) diameter machine bolts with hexagon head.

2) Washers: ANSI B18.21.1, medium or heavy lock-spring washers.

3) Nuts: ASTM A 563, Grade C, heavy, hexagon-type nuts.

4) Square Nuts: ASTM A 563, Grade A, plain.

B201001 1.6 CONCRETE WALL PANEL RESTORATION

Materials, physical and chemical properties, and composition of new concrete must match that of existing concrete to be repaired, unless samples and testing determine that existing mixtures and materials are faulty or non-performing.

B201001 1.6.1 Existing Concrete Testing

Take representative samples of existing concrete from areas of the structure to be repaired at indicated locations. The samples must be taken in accordance with ASTM C 42 and ASTM C 823 and tested in accordance with ASTM C 39, ASTM C 42, ASTM C 295, ASTM C 457, ASTM C 856, ASTM C 1218/C 1218M, and ASTM C 642, ASTM C 114, and ASTM C 1084. Evaluate aggregates in the existing concrete in accordance with ASTM C 136 and ASTM C 295. Determine the air content of the existing concrete in accordance with ASTM C 457 and ASTM C 642.

B201001 1.6.2 Admixtures

Air entraining admixtures must conform to ASTM C 260, water-reducing or -retarding admixtures must conform to ASTM C 494, and pigments for integrally colored concrete must conform to ASTM C 979 and ASTM C 1017. Admixtures must not contain added chlorides.

B201001 1.6.3 Aggregates

Aggregates must conform to ASTM C 33.

B201001 1.6.4 Cement

Match cement composition of cement used in existing concrete to be repaired as determined by samples and testing and conforms to the basic requirements of ASTM C 150, Type I or II. Provide cement with non-shrink (shrinkage compensating) properties and conforms to ASTM C 1107, Class B or C, expansive cement type.

B201001 1.6.5 Pozzolan

Provide pozzolan to conform with ASTM C 618, Class F, including limit on available alkalis, "Table 2 - Supplementary Optional Chemical Requirements," and uniformity requirements, "Table 4 - Supplementary Optional Physical Requirements."

B201001 1.6.6 Epoxy Anchor Adhesives

Use epoxy-resin grout to bond steel anchors to concrete with a 100 percent solids, moisture insensitive, low creep, structural adhesive. The epoxy must conform to ASTM C 881, type IV; grade and class selected to conform to the manufacturer's recommendations for the application. The epoxy adhesive must be conditioned, proportioned, mixed, and applied in accordance with the manufacturer's recommendations, except as otherwise specified herein.

a. Epoxy-resin grout - Provide a two-component material, 100 percent solids by weight, formulated to meet the requirements of ASTM C 881, Type I or II. Use type I material when materials or atmospheric temperatures are 70 degrees F (21 degrees C) or above. Use type II material when materials or atmospheric temperatures are below 70 degrees F (21 degrees C). Provide epoxy-resin grout with the ability to structurally rebond cracks, delaminations, and hollow plane conditions in concrete; must be insensitive to the presence of water; and must have the capability to penetrate cracks down to 5 mils in width. Materials must have been successfully used in similar conditions for a period of at least five years.

b. Epoxy Injection Ports – Design injection ports for epoxy-resin grout for the intended use as required in this section and made according to the recommendation of the epoxy manufacturer.

B201001 1.7 WOOD SIDING SYSTEM

B201001 1.7.1 Horizontal Wood Siding

Horizontal Wood Siding: DOC PS 20, exterior, lap type, 6 inches wide, maximum practicable lengths, 7/16 inch (11 mm) thick, smooth face. Shop coat all surfaces of wood siding and trim with an alkyd primer.

a. Species and Grades

Utilize species and grades listed:

1) Grade 1 Common spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.

2) Grade Prime or D finish, pressure-preservative-treated hem-fir; NLGA, WCLIB, or WWPA.

3) Grade D Select (Quality) eastern white pine, eastern hemlock-balsam fir-tamarack, eastern spruce, or white woods; NELMA, NLGA, WCLIB, or WWPA.

4) Grade D Select northern white cedar; NELMA or NLGA.

5) Grade B & B, pressure-preservative-treated southern pine; SPIB.

b. Water resistive barrier – Install to protect back-up wall assembly.

B201001 1.8 VINYL SIDING SYSTEM

Integrally colored, vinyl siding complying with ASTM D 3679. Horizontal or vertical pattern with exposure and shape to be compatible with overall design concept. Provide a water resistive barrier to protect back-up wall assembly and install in accordance with manufacturer's recommendations.

B201001 1.8.1 Texture, Thickness, Finish and Color

Wood grain texture. Minimum Nominal Thickness: 0.044 inch (1.1 mm). Minimum Profile Depth (Butt Thickness): 5/8 inch (16 mm) or 3/4 inch (19 mm). Nailing Hem: Double thickness. Comply with manufacturer's requirements for fastener types and nailing process.

B201001 1.8.2 Accessories

Provide integrally colored, premanufactured accessories to match siding. Use accessories at terminations with other materials.

B201001 1.9 MANUFACTURED FACED PANELS SYSTEMS EXTERIOR WALL SIDING

B201001 1.9.1 Glass Fiber Reinforced Cementitious Panels System

Siding made from fiber-cement board that does not contain asbestos fibers; complies with ASTM C 1186, Type A, Grade II; is classified as noncombustible when tested according to ASTM E 136; and has a flame-spread index of 25 or less when tested according to ASTM E 84. Provide a water resistive barrier under panel systems and install in accordance with manufacturers recommendations. Panel system must be a horizontal siding pattern in plain or beaded-edge style, unless vertical sheet panels are allowed by the RFP Part 3. Texture: Rough sawn or smooth, factory primed.

B201001 1.10 OTHER EXTERIOR WALL CLOSURE

B201001 1.10.1 Glass Block

a. Provide clear colorless glass block. Units to have polyvinyl

butyral edge coating. Units to have 75 percent light transmission allowance. Utilize ventilators and accessories recommended by glass block manufacturer. Glass block specified is manufactured by Pittsburgh Corning Corporation. The manufacturer's name and catalog identification are provided to describe physical characteristics and functional requirements of the product desired. Other manufacturers' products that are considered to be the functional equivalent will be acceptable.

b. Provide DECORA, VUE, or ARGUS pattern for the exterior glass block units. Units designated as "reflective glass block" must have a highly reflective oxide surface coating of a gray color.

B201001 1.10.2 Concrete Unit Masonry

Masonry walls must comply with ACI 530.1. Load-bearing units: ASTM C90, Non-load bearing- units: ASTM C129, Type I or II. Provide ground face units, split-faced units, ground-faced units, or split-ribbed units for exposed exterior walls. Provide water repellent admixture to masonry units where the exterior face of the units will not receive a waterproof coating such as paint. Mortar must conform to ASTM C 270, Type S. Test mortar in accordance with ASTM C 780. Provide water repellent admixture and color additive in mortar for masonry walls that will not receive a waterproof coating such as paint. Do not use admixtures containing chlorides. Provide air entrainment, not to exceed 12 percent, in mortar.

a. Adjustable Anchors for Structural Members - Use adjustable anchors to anchor masonry structural steel columns or beams. Weld the fixed portion of the anchors (steel anchor rods) to the structural steel member. Provide adjustable anchors 3/16 inch (5 mm) diameter steel wire, triangular-shaped. Anchors attached to steel must be 5/16 inch (8 mm) diameter steel bars placed to provide 1/16 inch (1.6 mm) play between flexible anchors and structural steel members.

b. Deformed Bars - ASTM A 615/A 615M, ASTM A 616/A 616M, ASTM A 617/A 617M, or ASTM A 706/A 706M.

B201002 EXTERIOR WALL BACKUP CONSTRUCTION

B201002 1.1 CONCRETE UNIT MASONRY

Provide concrete unit masonry as described in B201001 1.10.2

Provide water resistive barrier on the cavity-facing wythe of the backup masonry. Coordinate water resistant barrier materials and methods to provide water control and vapor transmission control for the lifetime of the structure. Seal all holes and penetrations in the water resistive barrier and repair any material damaged by other construction operations.

B201002 1.2 LOAD-BEARING METAL FRAMING SYSTEM

Exterior Studs:

Max. Deflection Criteria Exterior Finish

L/360	Cement Plaster, Wood Veneer, Synthetic Plaster, Metal Panels
L/600	Brick Veneer, Stone Panels

Compute wall deflections on the basis that studs withstand all lateral forces independent of any composite action from sheathing materials. Design studs abutting windows or louvers not to exceed 1/4-inch maximum deflection and as required in UFC 4-010-01.

a. Studs - ASTM A1003/ASTM A1003M, Structural Grade 50, Type H minimum; provide Z180 (G60) galvanized coating in accordance with ASTM A653/ASTM A653M. Do not expose studs to direct moisture contact. Clearly stamp studs with manufacturer's name, initials, or logo, an ICC-ES number, material thickness and yield strength. Choose size and gage as required to meet the loading requirements specified.

b. Bracing - Provide horizontal bracing in accordance with design calculations and AISI SG-673, consisting of, as a minimum, runner channel cut to fit between and welded to the studs or hot- or cold-rolled steel channels inserted through cutouts in the web of each stud and secured to studs with welded clip angles. Provide bracing, as a minimum, at 5 feet (1.52 meters) o.c. for wind load only, and 3 foot 4 inches (1.0 meters) o.c. for axial loads.

c. Sheathing - Provide sheathing to withstand structural loads imposed on the wall structure. Cover sheathing with either a 15 pound asphalt-impregnated building paper, or air barrier as required by the wall moisture analysis. Provide one of the following sheathings:

(1) Plywood: C-D Grade, Exposure 1, with an Identification Index of not less than 24/0.

(2) Structural-Use and Oriented Strand Board (OSB) Panels: Sheathing grade with durability equivalent to Exposure 1, Span Rating of 24/0 or greater.

(3) Gypsum: ASTM C79/C 79M and ASTM C1177/C1177M, 1/2 inch (13 mm) thick fire retardant (Type X) 5/8 inch (15 mm) thick; 4 feet (1.2 meters) wide with square edge for supports 16 inches (400 mm) o.c. with or without corner bracing of framing. Face gypsum sheathing with materials capable of resisting six months of weathering exposure without degradation of the covering or the gypsum material. Seal all joints as recommended by the manufacturer.

d. Water resistive barrier – Install to protect back-up wall assembly.

B201002 1.3 WOOD FRAMING SYSTEM

Kiln-dry all lumber materials to comply with DOC PS 20. Installation must be in accordance with AF&PA T11. Use preservative pressure treated lumber at sill plates and other members in contact with concrete and masonry surfaces.

a. Species and Grades - Provide species and grades listed:

(1) Grade 2 Common spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.

(2) Grade 2 Common, hem-fir; Douglas-fir; NLGA, WCLIB, or WWPA.

(3) Grade 2 Common, southern pine; SPIB.

b. Sheathing - Sheathing must withstand structural loads imposed on the wall structure. Cover sheathing with a water resistive barrier and other barriers as required by the vapor pressure and hygrothermal analysis. Provide one of the following sheathings:

(1) Plywood: C-D Grade, Exposure 1, with an Identification Index of not less than 24/0.

(2) Structural-Use and Oriented Strand Board (OSB) Panels: Sheathing grade with durability equivalent to Exposure 1, Span Rating of 24/0 or greater.

(3) Gypsum: ASTM D 3273 for mold resistance, ASTM C 1177/C1177M, fire retardant (Type X) 5/8 inch (15 mm) thick; 4 feet (1.2 meters) wide with square edge for supports 16 inches (400 mm) o.c. with or without corner bracing of framing. Face gypsum sheathing with materials capable of resisting six months of weathering exposure without degradation or the covering or the gypsum material. Seal all joints as recommended by the manufacturer.

c. Water resistive barrier – Install to protect back-up wall assembly.

B201002 1.4 CAST-IN-PLACE CONCRETE SYSTEM

a. Unless otherwise noted herein, all concrete design and construction must be in accordance with UFC 1-200-01.
b. Concrete construction must be in accordance with ACI 301.
c. Refer to Performance Verification Testing for Cast-in-place field quality control.
d. Concrete construction tolerances must be in accordance with ACI 117.
e. Design for watertight joints, or weeping joints having back-up water penetration protection in precast elements. Minimize cracking potential of precast concrete elements by implementing expansion and control joints in the precast assembly.
f. Joints must include properly sized and placed backing material and fully loaded and tooled sealant joint of no less than 1/4 inch sealant material thickness.
g. Provide a water resistive barrier to protect back-up wall assembly.

B201003 INSULATION AND VAPOR RETARDER

Provide insulation, air barriers, water resistive barriers, and moisture barrier/ vapor retarders (if required) in the exterior enclosure to control heat loss/gain, air infiltration/diffusion, moisture infiltration/diffusion, and water infiltration. These barriers can be accomplished by insulation, liquid application, applied sheet materials, or applied membranes.

Provide insulation, air barrier and water resistive barrier on all conditioned facilities and moisture barrier/ vapor retarders when required by the exterior enclosure vapor pressure and hygrothermal analysis. These barrier materials may be installed separately or combined if different air barrier, moisture barrier/ vapor retarder, and water resistive barrier functions can be consolidated in one material.

Provide exterior enclosure barriers that are durable and designed to last the life of the facility. Seal the continuous air and water resistive barrier in a flexible

manner to allow for relative movement of adjacent building enclosure components. Support exterior enclosure barriers to withstand maximum positive and negative air pressure to be placed on the building without displacement or damage and transfer the load to the structure. Permanently seal penetrations, joints, holes, and transitions to adjoining construction in air and water resistive barriers as recommended by the material manufacturer. Do not compromise exterior enclosure barrier integrity at electrical boxes, fixture supports, and fasteners with holes through the exterior enclosure barriers that allow air or water leakage. Do not expose exterior enclosure barriers or retarders to environment conditions longer than is recommended by the manufacturer.

B201003 1.1 INSULATION SYSTEMS

Vertical and horizontal polystyrene insulation conforming to ASTM C578 or rigid polyisocyanurate board wall insulating products conforming to ASTM C591 or mineral-fiber blanket insulation conforming to ASTM C 665 must be provided. Wall insulating product must have a minimum R-value as indicated by applicable ASHRAE 90.1 calculations called for in UFC 1-200-02, *High Performance and Sustainable Building Requirements*, and meeting minimum building envelope insulation requirements of UFC 3-101-01 *Architecture*and the energy design of the facility. Seal the joints in rigid insulation within cavity/veneer walls for additional moisture and air infiltration protection.

B201003 1.2 AIR BARRIER

The building air barrier is a combination of various construction materials/ components that form a continuous air barrier seal on all six sides of a building. Materials designated as a part of the air barrier must use methods recommended by the manufacture to seal joints and intersections for air-tightness. Individual materials used in the continuous air barrier must have an air permeance not to exceed 0.004 cfm/ft2 at a pressure differential of 0.3 inches water (1.56lb/ft2), (0.02 L/s. m2 at 75 Pa) when tested in accordance with ASTM E 2178. If the air barrier is to be field tested, refer to the requirements in the paragraph entitled "Air Barrier Performance Testing" of this section for entire building minimum air permeance. Air barrier installation at windows must be in accordance with ASTM E 2112.

B201003 1.2.1 Exterior Enclosure Air Barrier Materials

Refer to Air Barrier Association of America (ABAA) to identify qualified materials with the appropriate performance for the air barrier. Utilize materials from the "ABAA Evaluated Air Barrier Materials" found at the following web link; http://www.airbarrier.org/materials/index_e.php

B201003 1.3 WATER RESISTIVE BARRIER

Provide a water resistant barrier to resist bulk water penetration and wind-driven rain that passes the exterior cladding of the facility. Provide vapor permeable water resistant barrier if the water resistive barrier function is combined with other exterior enclosure barrier functions. Integrate water resistive barriers with wall flashing to form a shingled effect and direct water down the outside surface of the water resistive barrier, away from the back-up wall assembly, and out of the wall. Comply

with the requirements of ASTM E2256 for mechanical fastened building wrap materials or ICC-ES Acceptance Criteria AC38 for other materials.

B201003 1.3.1 Exterior Enclosure Water Resistive Barrier Materials

Refer to Air Barrier Association of America (ABAA) to identify qualified materials with the appropriate performance for the water resistive barrier. Utilize materials from the "ABAA Evaluated Air Barrier Materials" found at the following web link; http://www.airbarrier.org/resistive/index_e.php

B201003 1.4 MOISTURE BARRIER/ VAPOR RETARDER

Provide a moisture barrier/ vapor retarder to slow or reduce the unintended movement of water vapor in and out of conditioned space, if required by exterior enclosure vapor pressure and hygrothermal analysis. Perform the analysis and provide a moisture barrier/ vapor retarders in accordance with UFC 3-101-01, *Architecture*. Choose the moisture barrier/ vapor retarder permeability as a function of climate, the characteristics of the materials that comprise the assembly, and the interior conditions. If required, install moisture barrier/ vapor retarder materials on the warm side of the building assembly insulation (in the predominate season for the facility climate). Select moisture barrier/ vapor retarders in accordance with ASTM C755.

B201004 PARAPETS

Avoid parapets when possible, but when necessary, provide parapets with the same materials as the exterior wall construction, including framing members, anchors, flashings, cants, and accessories. Parapets must be designed to withstand the lateral loads prevailing at the project site and be provided with thruwall flashing below the parapet cap, at structural members, at penetrations, and at the roof level. Provide flashing and scuppers in accordance with SMACNA.

B201005 EXTERIOR LOUVERS & SCREENS

If required, provide louvers, which are not an integral part of the mechanical equipment, exterior closures, grilles and screens, storm shutters, and other materials used for a variety of purposes including screening of equipment or as louvers for exterior doors.

Louvers, screens, grilles in must be selected in a color and design that is compatible with the fabric of the exterior architectural character as described below. For frame construction, install in accordance with ASTM E 2112.

B201005 1.1 WALL LOUVERS

Wall louvers must be drainable blade type louver with blade slopes of 45 degrees minimum, but provide wind driven rain rated louvers for wall louvered rooms without a floor drain within the room. Louvers must be made to withstand a wind load of not less than 30 psf (146 Kg/m2), .08 inch (2 mm) thick 6063-T5 or T52 extruded aluminum in a factory-finished color in accordance with AAMA 2605 with a minimum coating thickness of 1.2 mil to match the building facade. Wall louvers must bear the AMCA certified ratings program seal for air performance and water penetration in accordance with AMCA 500 , 500L (wind driven rain), and AMCA 511. Provide sill flashing

with sloped drain pan at base of louver to collect moisture that migrates down the interior face of the louver. This sill flashing must drain water to the outside of the building. Louvers must have bird screens.

B201005 1.2 SCREENED EQUIPMENT ENCLOSURE

Design and fabricate support frames to withstand wind loads. Anchor frames securely in place. Provide secondary horizontal steel or aluminum framing for attachment of screen materials. Screen material must be factory finished coating in accordance with AAMA 2605 with a minimum coating thickness of 1.2 mils. Formed metal panels from galvanized steel sheet per ASTM A 653 or aluminum sheet per ASTM B 209.

B201005 1.3 STORM SHUTTERS

B201005 1.3.1 Roll Shutters

Roll shutters must have factory finished 0.050 inch (1.27 mm), 6063-T5/T6 aluminum slats with continuous over-head housing, frame and tracks. Roll shutter must be capable of being locked in a closed position by a non-key device.

B201005 1.3.2 Accordion Shutters

Accordion shutters must have factory-finished aluminum alloy 6063-T5/T6 slats and tracks. Accordion shutter must have stainless steel wheel carriers, nylon wheels and guides with stainless steel fasteners and be capable of being locked in a closed position by a non-key device.

B201005 1.3.3 Hinged Louvered Shutters

Hinged louvered shutters must have factory finished 0.50 inch (13 mm), 6063-T5/T6 aluminum louvered blades and frames with stainless steel hinges, holders, and fasteners. Allow minimum space between horizontal louver blades. Provide storm bar where required due to the lateral loads imposed on the shutter.

B201005 1.3.4 Removable Shutters

Removable shutters must have formed factory finished 0.050 inch (1.27 mm), 3003-H16 aluminum panels and continuous 6063-T5/T6 header and base frame with stainless steel fasteners or spring tempered stainless steel clips.

B201005 1.3.5 Exterior Door Louvers

If allowed by UFC 4-010-01, louvers for exterior doors must be inverted "Y" type with minimum of 30 percent net-free opening. Weld or tenon louver blades to continuous channel frame and weld assembly to door to form watertight assembly. Form louvers of hot-dip galvanized steel of same gage as door facings. Louvers must have steel-framed insect screens secured to room side and readily removable. Louvers must have aluminum wire cloth, 18 by 18 or 18 by 16 inch mesh, for insect screens. Net-free louver area to be before screening.

B201006 BALCONY WALLS & HANDRAILS

B201006 1.1 PRECAST CONCRETE BALCONY WALLS

Precast concrete balcony walls must be in accordance with section B201001 EXTERIOR CLOSURE paragraph titled, "Precast Concrete Wall Panels."

B201006 1.2 UNIT MASONRY BALCONY WALLS

B201006 1.2.1 Clay Masonry Units

Clay masonry balcony walls must be in accordance with section B201001 EXTERIOR CLOSURE, paragraph titled, "Face Brick."

B201006 1.2.2 Concrete Masonry Units

Concrete masonry balcony walls must be in accordance with section B201001 EXTERIOR CLOSURE, paragraph titled, "Unit Masonry."

B201006 1.3 METAL FRAMED ASSEMBLY BALCONY WALLS

Metal framed assembly balcony walls must be in accordance with section B201001 EXTERIOR CLOSURE, paragraph titled, "Load Bearing Metal Framing System."

B201006 1.4 WOOD FRAMED ASSEMBLY BALCONY

Wood framed assembly balcony walls must be in accordance with section B201001 EXTERIOR CLOSURE, paragraph titled, "Wood Framing System."

B201006 1.5 HANDRAILS

Design handrails and anchorage connections to resist loads in accordance with IBC. Provide materials in accordance with NAAMM PR, with the same size handrail and vertical post. Provide series 300 stainless steel pipe collars. Factory coat all metal railings, except ornamental metals such as brass, bronze, and nickel-silver, with a high performance coating in accordance with AAMA 2605 with a minimum coating thickness of 1.2 mils unless otherwise noted.

B201006 1.5.1 Steel Handrails

Steel handrails, including inserts in concrete, steel pipe conforming to ASTM A 53 or structural tubing conforming to ASTM A 500, Grade A or B of equivalent strength must be provided. Steel railings must be of 1 1/2 inches (38 mm) nominal size. Railings must be hot-dip galvanized, shop primed shop painted for exterior applications.

B201006 1.5.2 Aluminum Handrails

Aluminum railing must be of 1-1/2 inch (38 mm) nominal schedule 40 pipe conforming to ASTM B 429 or 1-3/4 inch (44 mm) square aluminum semi-hollow tube with rounded corners conforming to ASTM B 221. Railings must be coated with a high performance coating or anodized in accordance with AAMA 611, Class I. All fasteners must be Series 300 stainless steel.

B201006 1.5.3 Wood Handrails

Wood handrails must be of pre-finished natural hardwood in oak, walnut, or ash. Wood must be coated with hard acrylic finish to withstand indentations.

B201007 EXTERIOR SOFFITS

Exterior soffit system assemblies must include trim and necessary accessories including high performance coatings, if required. Installation must be crisp, fit and trim with tight joinery to back-up framing. Soffits must be designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching through panels to galvanized, non-load bearing framing conforming to ASTM A 653 (G60) and ASTM C 645, using concealed fasteners. Provide trim accessories of the same material and finish as the soffit material where soffit abuts other materials.

Use adequate backing material to assure snug joints and even face planes. Where soffits ventilate an attic space, or an otherwise unventilated space, provide a soffit/ridge/louver/ventilator ventilation system with air quantities complying to the IBC. For spaces intentionally not vented, provide sealed soffits to maintain the integrity of the air barrier and insulation barrier.

B201007 1.1 METAL SOFFIT PANELS

Metal soffit panels must be factory-formed and factory-finished. Use factory-applied sealant in side laps

B201007 1.2 VINYL SOFFIT SYSTEM

If required, provide integrally colored vinyl soffit complying with ASTM D 4477.

B201007 1.3 EXTERIOR GYPSUM BOARD SYSTEM

Exterior gypsum wall board soffit system must be tapered edge 5/8 inch (16 mm) thick, 48 inch (1.2 meter) wide exterior gypsum board panels conforming to ASTM C 931 and ASTM C 840, mechanically attached to galvanized non-load bearing framing conforming to ASTM A 653, G60 and ASTM C 754. Tape and finish gypsum board joints in accordance with ASTM C840. Soffit design must assure that the gypsum soffit material does not have direct water contact.

B201008 WALL FLASHING

Flashing must be aluminum or stainless steel or copper. Aluminum must conform to ASTM B 209/B 209M, 0.040 inches (1.27 mm) thick and must be coated to match the item flashed. Stainless steel must conform to ASTM A 167, type 302 or 304, 2D finish, fully annealed, dead soft temper. Thickness must be a minimum of 0.018 inches (0.4572 mm). Copper must conform to ASTM B 370, cold rolled temper. Thickness of copper must be 20 ounces per square foot (6.125 Kg/m2). Incorporate the flashing in the water resistive barrier and seal joints to flashing to form a shingled effect and direct liquid water to the exterior of the exterior enclosure and away from back-up wall assembly.

B201009 EXTERIOR PAINTING AND SPECIAL COATINGS

Apply coatings directly to all non-prefinished surfaces of the exterior construction. Comply with Master Painters Institute requirements for surface degradation analysis, surface preparation, paint and coating selection, paint application restrictions for substrate materials, and paint application.

B201009 1.1 GENERAL REQUIREMENTS

Painting practices must comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards. Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates.

All paint must be in accordance with the Master Painter Institute (MPI) standards for the exterior architectural surface being finished. The current MPI, "Approved Product List" which lists paint by brand, label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a more current MPI "Approved Product List"; however, only one list may be used for the entire contract. All coats on a particular substrate, or a paint system, must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

Select paint systems for the project in accordance with the MPI Architectural Painting Decision Tree available on the Whole Building Design Guide. Use this interactive MPI Decision Tree website to identify applicable paint system(s) for the project. The MPI Decision Tree identifies paint systems for each interior or exterior coated surface in "Normal" or "Aggressive" environmental conditions and generally lists the applicable paint systems in descending order of performance. The paint system at the top of each substrate list generally indicates the highest performing acceptable coating system.

Choose the "Aggressive" environmental conditions in the MPI Decision Tree for exterior systems that are used in moist humid conditions, abrasive conditions, chemical exposure conditions, or within five miles proximity of the ocean or a body of water. Also use "Aggressive " environmental conditions in interior spaces that are exposed to in moist humid conditions, abrasive conditions, chemical exposure conditions, such as bathrooms, shower rooms, kitchens, chemical storage area, swimming pools, laundry, sanitary areas, commercial kitchens, industrial production areas, and hospital operating rooms provide paint systems that comply with the MPI Decision Tree "Aggressive" environmental conditions.

Comply with the following requirements when determining the appropriate paint or coating system from the MPI Decision Tree:

a. Some of these paint systems are identified with a "NAVFAC Anchor". This "NAVFAC Anchor" indicates the minimum performing system that NAVFAC will accept for that substrate and environmental conditions.

b. When multiple "NAVFAC Anchors" are indicated on a certain substrate and environmental condition, provide the "NAVFAC Anchor" paint or coating system that is most appropriate for the facility use.

c. If only one MPI Decision Tree choice is available for a certain

substrate and environmental condition with no indicated NAVFAC preference, provide that sole option for NAVFAC projects.

d. If the MPI Decision Tree provides multiple choices and no NAVFAC preference is denoted, refer to the Additional RFP Requirements below to determine level of performance.

e. If the MPI Decision Tree does not identify all paint system applicable to the facility, utilize the *MPI Architectural Painting, Exterior Systems Manual* to identify other appropriate paint systems for the project. Utilize the "Premium Grade" systems and comply with all limitations stated in the MPI "Approved Product List" for each paint product. Products having an MPI VOC Range E3 must be given preferential consideration over lower VOC Ranges. Use higher performing paint systems unless the lower performing paint system can be justified based on a lifecycle cost to include surface preparation, application, disposal, environmental impact, and required recoating cycles. Only use paint products that have been tested for MPI'S "DETAILED PERFORMANCE" or "EVALUATED PERFORMANCE ". Do not use products that have only been tested for "INTENDED USE".

f. If an "Aggressive" environmental condition option is not available in the MPI Decision Tree for a certain substrate, use the "Normal" environmental condition option.

g. Refer to the Additional Exterior Paint and Coating System Requirements below for further system requirements.

Paints and coatings must comply with Master Painters Institute Green Performance Standard GPS-1-12 which is available at the following website; http://www.specifygreen.com/EvrPerf/EnvironmentalPerformance.html . Choose paints that provide performance, are environmentally friendly, and that conform to EPA or local environmental regulations, whichever requires the lowest VOC content.

B201009 1.1.1 MPI Gloss Levels

Gloss levels must comply with the MPI system of determining gloss as defined in the Evaluation sections of the MPI Manuals. Utilize the performance characteristics of the paint gloss and sheen to categorize paint rather than manufacturers' description of the product. The MPI Gloss Levels are indicated by the notation G1, G2, G3, G4, G5, G6, or G7. Navy only uses MPI Gloss Levels G2, G3, G5, G6.

The MPI Decision Tree indicates a default gloss level for each paint system, however consider the appearance, anticipated conditions, and need for cleaning when establishing the final gloss level for each coated surface of the project. Comply with the following guidance in choosing the appropriate gloss level.

a. Use G2 "Velvet-like" Flat for ceilings, residential walls away from human contact and low traffic areas.

b. Use G3 "Eggshell-like" in high traffic areas for ceilings and walls, when human contact with the wall is limited, and for dark accent colors.

c. Use G5 Semigloss for walls, doors and trim for high durability and clean ability and when a surface is expected to have routine human contact.

d. Use G6 Gloss only in special situations such as for piping identification or special effects.

The MPI gloss and sheen standard values are per ASTM D523, and are as follows:

Gloss Level Number	Gloss@60 Degrees	Sheen@85 Degrees
Gloss Level 1(G1)–Matte or Flat	Max.5 units	Max.10 units
Gloss Level 2(G2)–"Velvet-like" Flat	Max. 10 units	10-35 units
Gloss Level 3(G3)–"Eggshell-like"	Max. 10-25 units	10-35 units
Gloss Level 4(G4)-"Satin-like	Max. 20-35 units	Min. 35 units
Gloss Level 5(G5)-Semi-Gloss	35-70 units	
Gloss Level 6(G6)–Gloss	70-85 units	
Gloss Level 7(G7)–High Gloss	More than 85 units	

B201009 1.1.2 MPI System Designations and Table Abbreviations

The MPI coating system number description is found in either the *MPI Architectural Painting Specification Manual*or the *Maintenance Repainting Manual*and defined as an exterior system

a. EXT - MPI short-term designation for an exterior coating system on a new surface.
b. REX - the MPI short term designation for an exterior coating system used in repainting projects or over existing coating systems.
c. DSD - the MPI short-term designation for Degree of Surface Degradation as defined in the Assessment sections in the *MPI Maintenance Repainting Manual*. Degree of Surface Degradation designates the MPI Standard for description and appearance of existing condition of surfaces to be painted. This DSD classification is used to determine the proper surface preparation necessary for painting.

B201009 1.1.3 Surface Preparation

Comply with the "Exterior Surface Preparation" section of the *MPI Architectural Painting Specification Manual*or the Exterior Surface Preparation” section of the *MPI Maintenance Repainting Manual*. All suggestive language such as "may" or "should" are deleted from the standard and "must" inserted in its place. Suggestive language such as "recommended" or "advisable" is deleted from the standard and "require" or "required" inserted in its place. The results of these wording substitutions change this document to required procedures. For surface preparation, determine a MPI DSD Assessment of each surface and comply with the MPI Surface Preparation Requirements relating to the assessments. Not withstanding MPI requirements,

clean exterior ferrous metal that is exposed to weather conditions (wind, precipitation, solar degradation, and humidity) to a SSPC SP 10 level (near white).

Remove dirt, splinters, loose particles, grease, oil, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. For existing buildings, use MPI *Maintenance Repainting Manual* to determine the coatings that need to be removed. Remove deteriorated or loose coatings before repainting begins. Oil and grease must be removed prior to mechanical cleaning. Cleaning must be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, must be spot-primed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

B201009 1.2 ADDITIONAL EXTERIOR PAINT AND COATING SYSTEM REQUIREMENTS

In addition to the MPI Decision Tree, comply with the following paint system requirements:

B201009 1.2.1 Pavement Coatings

a. EXT 3.2 Concrete Horizontal Surfaces

Normal/ Aggressive Condition; Pigmented;

Provide road and parking lot pavement marking in accordance with UFGS 32 17 23.00 20, *Pavement Markings.*

b. EXT 10.2 Bituminous Coated Surfaces

Normal/ Aggressive Condition; Pigmented;

Provide road and parking lot pavement marking in accordance with UFGS 32 17 23.00 20, *Pavement Markings.*

B201009 1.2.2 Hot Metal Surfaces (including smokestacks),

a. EXT 5.2 Hot Metal, Up to 205 degrees C 400 degrees F

Normal/ Aggressive Condition; Pigmented

(1) EXT 5.2A - Heat Resistant Enamel

Primer: Intermediate/ Topcoat:

MPI 21 Surface Preparation and numbers of coats per manufacturers'

instructions.

b. EXT 5.2 Hot Metal (Ferrous), Up to 400 degree C, 750 degree F

Normal/ Aggressive Condition; Pigmented;

(1) 5.2C - Heat resistant - inorganic zinc coating

Primer: Intermediate/ Topcoat:

MPI 19 Surface Preparation and numbers of coats per manufacturers' instructions.

(2) 5.2B - Heat resistant - aluminum finish enamel

Primer: Intermediate/ Topcoat:

MPI 2 Surface Preparation and numbers of coats per manufacturers' instructions.

c. EXT 5.2 Hot Metal (Non-Ferrous), Up to 593 degree C, 1100 degree F

Normal/ Aggressive Condition; Pigmented

(1) 5.2D - Heat Resistant Coating

New and existing surfaces cleaned bare to SSPC SP 10/NACE No. 2

Primer: Intermediate/ Topcoat:

MPI 22 Surface Preparation and numbers of coats per manufacturers' instructions.

B201010 EXTERIOR JOINT SEALANT

Sealant joint design, priming, tooling, masking, cleaning and application must be in accordance with the general requirements of *Sealants: A Professionals' Guide*from the Sealant, Waterproofing & Restoration Institute (SWRI). All sealant must conform to ASTM C 920.

Joints must include proper backing material for sealant support during application, control of sealant depth, and to act as a bond breaker. Use filler boards, backer rods and bond breaker tapes. Provide priming unless specifically not recommended by the sealant manufacturer. Applied sealant must be tooled. Tooling must not compact sealant too less than the minimum sealant thickness required. Mask adjacent surfaces to control sealant boundaries during sealant application.

B201011 SUN CONTROL DEVICES (EXTERIOR)

Sun control devices must be manufactured devices to provide sun control on exterior windows and storefronts. Sun control devices must be designed and installed to withstand the wind loads prevailing at the project site.

B201011 1.1 EXTERIOR SUN SCREENS

Exterior sun screens must be of aluminum with 6063-T5/T6 aluminum demountable frame attachment. Screen material must be formed factory finished metal from aluminum sheet per ASTM B 209. Screen material must be factory finished coating in accordance with AAMA 2605 with a minimum coating thickness of 1.2 mils. Sunscreen must be awning, fin or other type appropriate to the installation.

B201012 SCREEN WALL

Screen walls include attached or unattached walls adjacent to the main building. Screen walls must conform to the applicable portions of Section B201001 EXTERIOR CLOSURE.

B201090 OTHER EXTERIOR WALLS

B2020 EXTERIOR WINDOWS

Standard windows must be in compliance with ANSI/AAMA/WDMA 101, SWI SWS, UFC 4-010-01, and the design criteria of ASCE 7 for glazed windows to meet the Building Code.

If required, provide windows that meet the requirements of AAMA/WDMA 101/I.S.2. Residential construction must utilize windows that comply with AAMA LC-25 designation unless the wind pressure on the building exceeds 38 psf (185 Kg/m2). Commercial (non-residential) construction must utilize windows that comply with AAMA designation HC-40 (60 psf - 293 Kg/m2) for windows that do not have to meet anti-terrorism requirements, and HC-60 (90 psf - 439 Kg/m2) for commercial windows that are required to meet anti-terrorism requirements, unless the wind pressure or blast pressure on the building exceeds the design pressure for these minimum windows. Determine the wind pressure on the building by converting the ASCE-7 basic wind speed to wind pressure and find the corresponding structural test pressure in the AAMA specific requirements or optional performance tables. If the residential window wind pressure exceeds of 38 psf (185 Kg/m2) or the commercial (non-residential) window wind pressure exceeds 60 psf (293 Kg/m2) or exceeds 90 psf (439 Kg/m2), utilize a higher AAMA designated window complying with the calculated wind pressure. Anti- Terrorism window systems (including connections) must meet the testing requirements of UFC 4-010-01 when tested in accordance with ASTM F1642.

Comply with ASTM E 2112 and with flashing and weather-resistive barrier manufacturers’ recommendations to install windows in framed wall construction. Comply with window flashing details from BIA for masonry back-up and veneer walls. Engineer and install window cleaning access and anchorage to the exterior wall for facilities over three stories tall without interior window cleaning access from pivoting or tilting sash. Provide anchors in accordance with OSHA standard 29 CFR Section 1910.66.

Windows must be provided with sills on the exterior and stools on the interior of the opening. Sills must be special shape or cut unit masonry or precast concrete

in masonry exterior construction and extruded aluminum or aluminum-wrapped wood framing or formed metal in other construction. Positively slope sills away from windows. Window stools must be slate or solid polymer for commercial construction and painted wood for residential construction.

B202001 WINDOWS

Exterior windows must consist of fixed and operable sash used singly and in multiples. Provide operable sash in spaces occupied by people as a minimum. Include operating hardware, non-corroding framed metal screens for operable sash, integrated blinds set between glass panels and security grilles. Provide jamb support for larger windows where recommended by manufacturer. Metal windows with insulating glass must have thermally broken frames and sash. Provide thermally broken windows and window assemblies where separating conditioned and unconditioned spaces. Provide windows and window assemblies that bear an NFRC energy performance label and meet or exceed current EnergyStar requirements.

Provide glazing in exterior windows in accordance with section B202004 EXTERIOR GLAZING.

B202001 1.1 STANDARD WINDOW SYSTEMS

B202001 1.1.1 Steel Windows

Conform to SWI SWS. Solid hot-rolled steel shape welded frames and mullions. Provide chemically cleaned and primed galvanized frames with polysteel powder coat finish. Provide glazing beads, steel frame screens with aluminum mesh at operable sashes, hardware and locks, and tinted glazing. Aluminum screens must comply with ANSI/SMA 1004.

B202001 1.1.2 Aluminum Windows

Conform to ANSI/AAMA/WDMA 101. Factory finish aluminum windows and provide with aluminum frame screens with aluminum mesh at operable sash, hardware and locks, and tinted glazing. Aluminum screens must comply with ANSI/SMA 1004.

Exposed aluminum surfaces must be factory finished with an AA 45 anodic coating or an AAMA organic coating. Provide a minimum of architectural Class II anodized coating or a baked enamel finish conforming to AAMA 2604 for residential construction. Provide a minimum of architectural Class I anodized coating or a high-performance organic coating conforming to AAMA 2605 for non-residential (commercial) construction. AAMA coatings must have a total dry film thickness of 1.2 mils.

B202001 1.1.3 Security Windows

Security windows delay forced entry into the building through the windows. In addition to meeting the requirements of AAMA 101, windows designated "resistance to forced entry" must conform to the requirements of AAMA 1302.

B202001 1.1.4 Plastic Windows, Factory Finish

Provide integral colored or co-extruded color PVC, welded and

reinforced corners, reinforcing members, fasteners, hardware, weatherstripping, welded sill, and anchors conforming to ANSI/AAMA/WDMA 101 or ASTM D 4099. The exterior grade polyvinyl chloride extrusion must comply with AAMA 303 and ASTM 4726.

B202001 1.1.5 Wood Windows

Wood windows must consist of complete units including sash, glass, frame, weatherstripping, insect screen, and hardware. Window units must meet the requirements of AAMA 101, except maximum air infiltration must not exceed 0.30 CFM per linear foot of sash crack when tested under uniform static air pressure difference of 1.57 psf (7.66 Kg/m2). Glass and glazing materials must conform to section B202004, EXTERIOR GLAZING. Insect screen must meet ASTM D 3656, Class 2, 18 by 14 mesh, color charcoal. Aluminum screen frames must meet SMA 1004.

a. Finish

1) Vinyl (PVC) Cladding: Preservative treat all basic wood frame and sash members in accordance with WDMA I.S.4, except do not use pentachlorophenol. Clad all exterior surfaces with rigid polyvinyl sheathing, complying with ASTM D 1784, class 14344-C, not less than 35 mil average thickness.

2) Aluminum Cladding: Preservative treat all basic wood frame and sash members in accordance with WDMA I.S.4, except do not use pentachlorophenol. Clad all exterior surfaces with roll formed aluminum with joints sealed during assembly. Aluminum clad frames and sash must meet performance requirements of AAMA 101. Aluminum finish must be an organic coating of an AAMA 2604 coating for residential construction and AAMA 2605 for non-residential (commercial) construction with a minimum dry film thickness of 1.2 mils.

B202002 STOREFRONTS

Provide one-story storefront system fabricated from formed and extruded aluminum and glass components for exterior use.

B202002 1.1 ALUMINUM-FRAMED STOREFRONTS

B202002 1.1.1 Performance Requirements

a. Structural Requirements, as measured in accordance with ANSI/ASTM E330: Wind loads for exterior assemblies must meet or exceed 25 psf (122 Kg/m2) acting inward and 25 psf (122 Kg/m2) acting outward. Design system to withstand this as a minimum and comply with design pressure established within the required ASCE 7-05 Wind Speed Calculations determined by the overall average opening within the project.

b. Deflection: Maximum calculated deflection of any framing member in direction normal to plane of wall when subjected to specified design pressures for spans up to and including 13’-6" must be limited to 1/175 of its clear span and for spans greater than 13’-6" deflection must

be limited to 1/240 + 1/4" of its clear span, except that maximum deflection of members supporting plaster surfaces must not exceed 1/360 of its span.

c. Air Infiltration - Air leakage through fixed light areas of storefront must not exceed 0.06 cfm per square foot of surface area when tested in accordance with ASTM E283 at differential static pressure of 6.24 psf (33.84 Kg/m2).

d. Water Penetration - When tested in accordance with ASTM E 331, there must be no water penetration at a pressure of 15 psf (73 Kg/m2) of fixed area.

e. Water infiltration No uncontrolled leakage when tested in accordance with ASTM E331 at test pressure of 10 psf (48 Kg/m2) for system standard and capable of performing within the Design Pressure requirements derived from the ASCE 7-05 requirements.

f. Provide storefront framing and glazing assembly with an overall thermal transmittance value of not more than 0.40 BTU/hr x ft2 x deg F as determined according to NFRC 100.

B202002 1.1.2 Doors And Frames

Provide doors complete with frames, framing members, subframes, transoms, adjoining sidelights, adjoining window wall, trim, and accessories, as required for a complete installation. Anchors must be stainless steel. Weatherstripping must be Continuous wool pile, silicone treated, or type recommended by door manufacturer. See B203008, EXTERIOR DOOR HARDWARE for hardware requirements.

B202002 1.1.3 Aluminum Alloy for Doors and Frames

ASTM B 221, Alloy 6063-T6 for extrusions. ASTM B 209, alloy and temper best suited for aluminum sheets and strips.

B202002 1.1.4 Fabrication

a. Aluminum Frames: Provide removable glass stops and glazing beads for frames accommodating fixed glass. Use countersunk stainless steel Phillips screws for exposed fastenings, and space not more than 12 inches (300 mm) o.c.. Mill joints in frame members to a hairline fit, reinforce, and secure mechanically.
b. Aluminum Doors: Doors must be medium or wide stile. Doors must be not less than 1-3/4 inches (44 mm) thick. Minimum wall thickness, 0.125 inch (3.175 mm), except beads and trim, 0.050 inch (1.27 mm). Bevel single-acting doors at lock, hinge, and meeting stile edges. Double-acting doors must have rounded edges at hinge stile, lock stile, and meeting stile edges.
c. Finishes: Provide exposed aluminum surfaces with factory finish of anodic coating conforming to AA45, Architectural Class I or an organic coating conforming to AAMA 2605 with a total dry film thickness of not less than 1.2 mils.

B202003 CURTAIN WALLS

B202003 1.1 GLAZED CURTAIN WALL SYSTEM REQUIREMENTS

Provide system complete with framing, mullions, trim, panels, windows, glass, glazing, sealants, insulation, fasteners, anchors, accessories, concealed auxiliary members, and attachment devices for securing the wall to the structure as specified.

Fully coordinate system accessories directly incorporated and adjacent to related work and insure materials compatibility, deflection limitations, thermal movements, and clearances and tolerances as specified. Design and test in accordance with *AAMA Curtain Wall Manual*.

Provide thermally broken curtain wall framing and infill glazing and panels where separating conditioned and unconditioned spaces.

B202003 1.1.1 Source

Curtain wall system components must be furnished by one manufacturer or fabricator; however, all components need not be products of the same manufacturer.

B202003 1.1.2 Cleaning Provisions

For curtain wall systems over two stories in height reinforce curtain wall members and provide support for cleaning rigs. The support for cleaning rigs may be provided by other elements of the facility.

B202003 1.1.3 Warranty

a. System Warranty – Manufacturer of the curtain wall system must be warrant that the design, construction, and materials installed in the system must be free of manufacturer's defects for the life of the installation. The manufacturer must provide a similar warranty for the individual components of the system that are provided by other, outside manufacturers. Execute the warranty for the system directly to the Government.

b. Additional Glass Warranty – Insulating glass units must be guaranteed not to develop material obstruction of vision as a result of dust or film formation on the inner glass surface caused by failure of the seal, other than through glass breakage, within a period of 5 years from date of acceptance of work by the Government. Units failing to comply with the terms of this guarantee must be replaced with new units without additional cost to the Government. The Contractor must require the manufacturer to execute their warranties in writing directly to the Government.

B202003 1.1.4 Design

a. Structural Requirements, as measured in accordance with ANSI/ASTM E330:

1) Wind loads for exterior assemblies: Provide systems capable of performing at a minimum C acting inward and 25 psf (122 Kg/m2) acting outward. Design system to withstand this as a minimum

and comply with design pressure established within the required ASCE 7-05 Wind Speed Calculations determined by the overall average opening within the project.

2) Deflection: Maximum calculated deflection of any framing member in direction normal to plane of wall when subjected to specified design pressures for spans up to and including 13'-6" must be limited to 1/175 of its clear span and for spans greater than 13'-6" deflection must be limited to 1/240 + 1/4" of its clear span, except that maximum deflection of members supporting plaster surfaces must not exceed 1/360 of its span.

3) Water Penetration/Water infiltration - No uncontrolled leakage when tested in accordance with ASTM E331 at test pressure of 10 psf (48.6 Kg/m2) for system standard and capable of performing within the Design Pressure requirements derived from the ASCE 7-05 requirements.

4) Air Infiltration - Air leakage through fixed light areas of storefront must not exceed 0.06 cfm per square foot of surface area when tested in accordance with ASTM E283 at differential static pressure of 26.24 psf (30.32 Kg/m2).

b. Delamination: Adhesively bonded metal-faced or glass faced panels must show no evidence of delamination, warpage or other deterioration or damage when subjected to the six "Accelerated Aging Cycles" specified in ASTM D 1037.

c. Thermal Conductance: The thermal transmittance of opaque panels must not exceed the specified U-value, when tested in accordance with ASTM C 236. The average calculated thermal transmittance of the complete wall assembly including panels, windows, and all other components must not exceed a U-value necessary to meet the energy budget of the facility. Determine U-values of components in accordance with ASTM C 236.

d. Window Tests: Windows must meet the requirements specified herein. Windows must meet the same requirements for deflection and structural adequacy as specified for framing members when tested in accordance with ASTM E 330 except permanent deformation must not exceed 0.4 percent; there must be no glass breakage, and no permanent damage to fasteners, anchors, hardware, or operating devices. Windows must have no water penetration when tested in accordance with ASTM E 331.

e. Fire Resistance Tests: Insulation provided in the curtain wall system or field applied in conjunction with the curtain wall system must have a flame spread rating not exceeding 75 and a smoke developed rating not exceeding 150 when tested in accordance with ASTM E 84, except as specified otherwise herein.

1) Insulation: Insulation contained entirely within panel assemblies which meet the flame spread and smoke developed ratings of 75 and 150 respectively. Insulation isolated from the building interior by masonry walls, masonry cavity walls, or encased in masonry cores is not required to comply with the flame spread and smoke developed ratings specified.

2) Curtain Wall Systems: Material for firestopping the opening between the edge of the floor slab and back of the curtain wall system, must have not less than the flame spread

and smoke developed ratings specified for insulation which is neither isolated from the building interior nor encased in masonry cores.

3) Curtain Wall Panels: Panels for fire resistive curtain walls must have the required fire resistive rating when tested in accordance with ASTM E 119.

4) Firestopping Materials and Devices: Firestopping material and attachment devices must be an effective barrier against the spread of fire, smoke, and gases for the required period of when exposed to the conditions of the standard ASTM E 119 time-temperature curve for a period equivalent to the fire rating of the floor system and must also be rated noncombustible when tested in accordance with ASTM E 136.

B202003 1.1.5 Tolerances

Design and erect wall system to accommodate tolerances in building frame and other contiguous work. Provide with the following tolerances:

a. Maximum variation from plane or location shown on DOR-approved shop drawings: 1/8 inch (3 mm) per 12 feet (3.7 meters) of length up to not more than 1/2 inch (13 mm) in any total length.
b. Maximum offset from true alignment between two identical members abutting end to end in line: 1/16 inch (1.6 mm).

B202003 1.1.6 Structural Requirements

Deflection and Structural Tests: No curtain wall framing member must deflect, in a direction normal to the plane of the wall, more than 1/175 of its clear span or 3/4 inch (20 mm), whichever is less, when tested in accordance with ASTM E 330, except that when a plastered or gypsum board surface will be affected the deflection must not exceed 1/360 of the span. No framing member must have a permanent deformation in excess of 0.2 percent of its clear span when tested in accordance with ASTM E 330 for a minimum test period of 10 seconds at 1.5 times the design wind pressures specified.

B202003 1.1.7 Thermal Movement

Fabricate, assemble, and erect system with adequate allowances for expansion and contraction of components and fastenings to prevent buckling damage, joint seal failure, glass breakage, undue stress on fastenings or other detrimental effects.

B202003 1.1.8 Curtain Wall Components

The curtain wall and the components listed below must be designed to meet the performance requirements below.

a. Framing Members in Curtain Wall Main Frames and Sash or Ventilator Members: extrusion strength must meet or exceed the physical properties required for minimum ultimate tensile yield

strength of 16,000 psi (110 MPa) when tested under AA ASDI, ASTM E34, and ASTM B221M (or ASTM B221).

b. Joint and Glazing Sealants: Perform tests as required by ASTM C 920.

c. Preformed Compression Gaskets and Seals: ASTM C 864.

d. Preformed Lock-strip Gaskets: ASTM C 542, modified as follows: Heat age specimens seven days at 158 degrees F (70 degrees C), in zipped or locked position under full design compression. Unzip, cool for one hour, re-zip, and test lip seal pressure, which must be minimum 2.5 pounds per linear inch on any extruded or corner specimen.

e. Spandrel Glass: Fallout resistance test, ASTM C 1048.

f. Porcelain Enamel: Acid resistance, color retention, and spall resistance tests, PEI 1001.

g. Anodized Finishes: Aluminum used for framing must have a color anodized NAAMM MFM finish designation AA-MIO-C22-A34 and AA-MIO-C22-A44, meeting the requirements of AAMA 611.

h. Glass and Glazing:

1) Conform to paragraph B202004, GLAZING.

2) Insulating Glass must meet ASTM E 546 or ASTM E 576 at minus 20 degrees F (minus 29 degrees C), no frost or dew point.

i. Firestopping Material - Mineral fiber manufactured from asbestos-free materials, and conforming to ASTM C 612 or ASTM C 665, meeting fire resistance requirements specified.

j. Screens - ASTM D 3656, Class 2, 18 by 14 mesh, color charcoal.

k. Panels - Unless otherwise indicated, design for installation from outside the building. Provide moisture/ vapor retarder on interior face of insulation. Seal edges of panels with cores of absorptive material to prevent entrance of water and allow venting of the core space to outside air.

1) Metal Facing Panels, Single Thickness - Metal facing panels must be single thickness. Panel facing must be flat sheet or textured type, made of porcelain enamel, aluminum, bronze, stainless steel and, with backside stiffeners or edge flanges spaced as required to meet flatness specified.

2) Adhesively Bonded Panels - Adhesively bonded panels must be sandwich type, metal faced both sides, and bonded to form stable and composite unit. Nonexposed face must be galvanized steel. Exposed face must be porcelain enamel, aluminum, bronze, or stainless steel, with continuous laminated backing or internal stiffening ribs or breaks spaced as required to meet flatness specified.

3) Nonmetallic Panels

a) Panels must be glass-faced on the side that will be exposed to view. Glass must be spandrel glass with ceramic coating on its non-weathering surface and smooth finish on the exposed surface; backing must be adhesively bonded to non-weathering surface.

b) Adhesively bonded insulated panels must be nonmetallic faced, sandwich type, tempered hardboard on exposed

face and on non-exposed face. Apply coating of epoxy or polyester followed by application of inert aggregate to exposed face in the factory. Inert aggregate must be natural stone chips.

l. Metal Windows – Conform to ANSI/AAMA/WDMA 101. Provide inside glazing with removable metal glazing beads except for windows with structural glazing. Factory finish aluminum windows and provide with aluminum frame screens with aluminum mesh at operable sash, hardware and locks, and tinted glazing. Aluminum screens must comply with ANSISMA 1004.

   Exposed aluminum surfaces must be factory finished with an AA 45 anodic coating or an AAMA organic coating. Provide a minimum of architectural Class II anodized coating or a baked enamel finish conforming to AAMA 2604 for residential construction. Provide a minimum of architectural Class I anodized coating or a high-performance organic coating conforming to AAMA 2605 for non-residential (commercial) construction. AAMA coatings must have a total dry film thickness of 1.23 mils.

m. Metal Accessories - Provide gravel stops and fascias, flashings, metal sills, metal stools, louvers, venetian blind pockets, and closures. Fabricate accessories of sizes and shapes indicated from similar materials and finish as specified for the wall system.

B202004 EXTERIOR GLAZING

Provide setting and sealing materials, stops and gaskets as recommended by the glass or acrylic sheet manufacturer.

Provide warranty for insulating glass units for a period of 10 years against development of material obstruction to vision (such as dust or film formation on the inner glass surfaces) caused by failure of the hermetic seal, other than through glass breakage. The Contractor must require the glazing warranty for curtain wall glazing to be written directly to the Government.

Provide warranty for polycarbonate sheet glazing for a period of 5-years against breakage, coating delamination, and yellowing.

Glazing thickness indicated in the following paragraphs is the minimum acceptable thickness. Provide thicker glazing if required by the manufacturer for the given application.

B202004 1.1 GLASS

B202004 1.1.1 Clear Glass

Type I, Class 1 (clear), Quality q4 (A).

B202004 1.1.2 Heat-Absorbing Glass

ASTM 1036, Type I, Class 2 (heat absorbing and light reducing), Quality q3 (select), 1/4 inch (6 mm) thick, with a light transmittance of approximately 45 percent and total solar transmittance of not more than 50 percent for 1/4 inch (6 mm) thickness. Use warm color tint for warm color frames and cool color tints for white and gray frames.

B202004 1.1.3 Wire Glass

Type II, Class 1, Form 1, Quality q8 Mesh m1 or Form 2, Quality q7, Finish f1, Mesh m1, 1/4 inch (6 mm) thick. Conform to NFPA 80. Glass for fire-rated windows muat be UL listed and must be rated when tested in accordance with ASTM E 163.

B202004 1.1.4 Laminated Glass

ASTM 1172, fabricated from two pieces of Type I, Class 1, Quality q3 glass laminated together with a clear 0.030 inch (0.75 mm) thick polyvinyl butyral interlayer. The total thickness must be nominally 1/4 inch (6 mm). Laminated glass used for anti-terrorism window assemblies must be a minimum of 1/4 inch (6 mm) thickness.

B202004 1.1.5 Insulating Glass Units

Provide insulated glass using a combination of the interior and exterior glazing materials listed below filled with a thermal resistive gas. The air space must be sized to meet the thermal requirements below but not less than one half inch(12 mm) for non-residential construction and one quarter inch(6 mm) minimum for residential construction.

Provide active solar control glazing by using tinting, maximum thermal resistance, special coatings to meet Energy Star climate zone and window type requirements(including frames), and comply with the performance characteristics below. Provide an active low-emissivity coating on glass surface number 2 (the inside surface of the exterior glass pane).

If the building is located in a heat dominated climate zone, the facility is designed to utilize solar heat gain to augment the HVAC system, and the window overhang design prohibits excessive solar gain; a passive low-emissivity coating may be used to accommodate the design. Occupied spaces adjoining passive low-emissivity coated glass must be designed for comfortable use of the space.

Provide two panes of glass separated by a dehydrated airspace and hermetically sealed. Dimensional tolerances must be as specified in IGMA TR-1200. The units must conform to ASTM E 773 and ASTM E 774, Class A. Provide primary seal, secondary seal, and spacers to eliminate moisture and hydrocarbon vapor transmission into airspace. Warranty insulating glass units against development of material obstruction to vision (such as dust, fogging, or film formation on the inner glass surfaces) caused by failure of the hermetic seal for a 10-year period following acceptance of the work.

The interior glass pane must be one of the following:

1. Typically ASTM C 1036, Type I, Class 1, Quality q4, minimum 1/4 inch (6 mm) thick;
2. ASTM C 1048, Grade B (fully tempered), Style I (uncoated), Type I, Class 1 (transparent), Quality q4, minimum 1/4 inch (6 mm) thick when required by ANSI Z97.1 or possible human impact is anticipated;

3. ASTM C 1172, laminated glass as specified above, when required by antiterrorism requirements.

The exterior glass pane must be one of the following:

1. Typically ASTM C 1036, Type I, Class 2 (tinted heat absorbing or reflective), Quality q4, minimum 1/4 inch (6 mm) thick;
2. ASTM C 1048, Grade B (fully tempered), Style I (uncoated), Type I, Class 2 (tinted heat absorbing or reflective), Quality q4, minimum 1/4 inch (6 mm) thick when required by ANSI Z97.1 or possible human impact is anticipated.

Insulating glass performance for active solar control using low-emissivity coatings:

1. Visible Light Transmission, 66% or lower

2. Outdoor Light Reflectance, 11% or greater

3. Solar Heat Gain Coefficient, .36 or lower

4. Winter U-Value, .35 Btu/square foot x hr x degree F or lower for residential construction and .29 Btu/square foot x hr x degree F or lower for all other types of construction.

B202004 1.1.6 Tempered Glass

ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class 1 (transparent) or 2 (tinted heat absorbing, Quality q3, 1/4 inch (6 mm) thick.

B202004 1.1.7 Bullet-Resisting Glass

ASTM 1172 and UL 752, fabricated from Type I, Class 1, Quality q3 glass with polyvinyl butyral plastic interlayers between the layers of glass and listed by UL ABPMED as bullet resisting, with a power rating of Medium—Small Arms, High—Small Arms, Super—Small Arms, High—Rifle, or as required by the building program in accordance with UL 752.

B202004 1.1.8 Patterned Glass

ASTM 1036, Type II, Class 1 (translucent), Form 3 (patterned), Quality q7 (decorative), Finish f1 (patterned one side), Pattern p2 (geometric) 7/32 inch (5.55 mm) thick.

B202004 1.1.9 Spandrel Glass

ASTM C 1048, Kind HS or FT, Condition B (ceramic coated), Type I, Quality q5, 1/4 inch (6 mm) thick.

B202004 1.1.10 Spandrel Glass with Adhered Backing

ASTM C 1048, Kind HS or FT, Condition B (ceramic coated), Type I, Quality q5, 1/4 inch (6 mm) thick and must pass the fallout resistance test specified in ASTM C 1048.

B202004 1.2 PLASTIC GLAZING

All plastic glazing exposed to the interior or exterior environment must have an applied hardcoat.

B202004 1.2.1 Bullet-Resistant Plastic Sheet

Provide cast acrylic sheet or mar-resistant polycarbonate sheet laminated with a special interlayer, and listed in UL 752 as bullet resisting, Class I, II, III, clear, or in color.

B202004 1.2.2 Acrylic Sheet Glazing

ASTM D 4802, Type I, regular, Type II, heat resistant, in various thicknesses, clear or colored.

B202004 1.2.3 Polycarbonate Sheet Glazing

ASTM D 3595, ANSI Z97.1, Mar-resistant, Clear and smooth both sides when used for vision glazing; Translucent, textured both sides when used for obscure glazing, tint to match frame, ultraviolet stabilized, thickness to be specified in mm and inches, and listed in UL ABPMED as burglar resisting. Mar-resistant sheet must have a change in haze of between 5 and 8 percent under silica carbide test, 56.44 ounces (1600 grams), ASTM D 673.

B202004 1.3 FRAGMENT RETENTION FILM FOR GLAZING

Existing windows that will not be replaced in the project must have fragment retention film if they require antiterrorism protection. The film must be polyester, polyethylene terephthalate, or a composite. Fragment retention film must be optically clear and free of waves, distortions, impurities, and adhesive lines. The film may be a single layer or laminated. Lamination of the film must only occur at the factory of the fragment retention film manufacturer. The film must include an abrasion resistant coating on the surface that does not receive the film adhesive. Fragment retention film must be a minimum thickness of 0.004 inch (0.1016 mm), or 0.007 inch (0.1778 mm), or 0.010 inch (0.254 mm). The film must be supplied with an optically clear weatherable pressure sensitive adhesive. The adhesive must contain ultraviolet inhibitors to protect the film for its required life and must limit ultraviolet transmission to not more than 8 percent of the radiation between 300 and 380 nanometers. The adhesive must not be water activated. A water-soluble detackifier or release liner may be incorporated over the adhesive to facilitate film application. The adhesive must be 90 percent cured within 30 days of installation. Adhesives on film thicknesses of 0.010 inch (0.254 mm) and greater must be a minimum of 0.0008 inch (0.02032 mm) thick.

B202090 OTHER EXTERIOR WINDOWS

B202090 1.1 OPERABLE TRAY PASS WINDOWS

Frames and glass channels must be of heavy type 6063-TS aluminum extrusions with reinforcing as required. Include bullet-resistant glazing and heavy-duty operable pass tray. Unit must have a minimum of architectural Class I anodized coating or a high-performance organic coating conforming

to AAMA 2605. AAMA coatings must have a total dry film thickness of 1.2 mils.

B2030 EXTERIOR DOORS

Exterior doors must be heavy duty insulated steel doors and frames for service access. Door frames must be welded. Corner knockdown door frames are not permitted.

Use heavy-duty overhead holder and closer to protect doors from wind damage. Provide kickplates on the inside face of all exterior doors.

Weather-protect all exterior doors and related construction with low infiltration weatherstripping and sealants. Provide threshold with offset to stop water penetration while maintaining accessibility compliance.

Conform to the design criteria of ASCE 7.

See section B203008, EXTERIOR DOOR HARDWARE, for door hardware requirements. For all installations, provide a recessed key box (Knox Box) approximately 7 inches x 7 inches (175 mm x 175 mm) with 4-3/4 inches (120 mm) solid steel door at primary exterior entry for storage of keys and access cards accessible by the fire department.

B203001 SOLID DOORS

B203001 1.1 STEEL DOORS

Hardware preparation must be in accordance with ANSI A250.6. Doors must be hung in accordance with ANSI A115.16.

B203001 1.1.1 Steel Doors

Steel doors must be ANSI A250.8, Level 4, exterior, main entry doors, with a physical performance level of, Model 1 or 2.

Doors may be specified to be insulated. Door selection must be specified in the project program according to the following:

a. Standard Duty Doors - Level 1, physical performance Level C, Model [1] [2]
b. Heavy Duty Doors - physical performance Level B, Model [1] [2]
c. Extra Heavy Duty Doors – ANSI A250.8, Level 3, physical performance Level A, Model [1] [2] [3]
d. Maximum Duty Doors – ANSI A250.8, Level 4, physical performance Level A, Model [1] [2]

B203001 1.1.2 Residential Insulated Steel Entry Door Systems

Insulated steel doors and frames must be provided for residential construction with a core of polyurethane foam and an R factor of 10.0 or more (based on a k value of 0.16). Face sheets, edges, and frames of galvanized steel not lighter than 23 gage thick (0.7 mm), 16 gage (1.5 mm) and 16 gage (1.5 mm) respectively; for paneled door faces, or 16 gage thick (1.5 mm) for solid doors, with vinyl door bottom flashing. Frames must be a minimum 16 gage thick (1.5 mm); with

magnetic weatherstripping; nonremovable-pin hinges; thermal-break aluminum threshold. Doors and frames must receive phosphate treatment, rust-inhibitive primer, and baked acrylic enamel finish. Doors must have been tested in accordance with SDI/DOOR A250.4 and must have met the requirements for Level C. Prepare doors to receive specified hardware. Doors must be 1-3/4 inch (44.5 mm) thick.

B203001 1.1.3 Insulation Cores

Insulated cores must be of type specified, and provide an apparent U-factor of .48 in accordance with SDI 113 and must conform to:

a. Rigid Polyurethane Foam: ASTM C591, Type 1 or 2, foamed-in-place or in board form, with oxygen index of not less than 22 percent when tested in accordance with ASTM D2863; or
b. Rigid Polystyrene Foam Board: ASTM C578, Type I or II; or
c. Mineral board: ASTM C612, Type I.

B203001 1.1.4 Accessories

a. Louvers must comply with SDI 111-C, must be stationary, sight-proof type. Use lightproof louvers if function of room requires darkness. Louver frames must be 20-gage steel with louver blades minimum 24 gage.
b. Astragals: For pairs of exterior steel doors that will not have aluminum astragals or removable mullions, provide overlapping steel astragals with the doors.
c. Moldings: Provide moldings around glass of exterior doors and louvers. Provide non-removable moldings on outside of exterior doors. Secure inside moldings to stationary moldings, or provide snap-on moldings. Muntins must interlock at intersections and must be fitted and welded to stationary moldings.

B203001 1.1.5 Standard Steel Frames

ANSI A 250.8. Form frames with welded corners for installation in exterior walls. Form stops and beads of 20 gage steel. Frames must be set in accordance with ASTM A250.11.

B203001 1.1.6 Anchors

Anchor all frames with a minimum of three jamb anchors and base steel anchors per frame, zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gage. Mortar infill frames in masonry walls, and infill with gypsum board compound at each jamb anchor in metal frame walls. Only use surface exposed bolted anchors in concrete walls.

B203001 1.1.7 Finishes

a. Exterior Doors, Factory-Primed and Field Painted Finish – Doors and frames must be factory primed with a rust inhibitive coating as specified in ANSI A250.8. Factory prime doors on six sides of the door. Manufacturer's primer and field painting must be compatible with finish system in the paragraph "EXTERIOR PAINTING AND SPECIAL COATINGS".

b. Exterior Doors Galvanized Finish – Must be Commercial Quality, Coating Class A, zinc coating in accordance with ASTM A 591 when facility is located further than 300 feet (91 meters) from the ocean. When facility is located within 300 feet (91 meters) of the ocean, provide G60 galvanized coating in accordance with ASTM A 924/A 924M and ASTM A 653/A 653M.

B203001 1.2 WOOD DOORS

Solid wood or particleboard core with solid wood edge bands and reinforced at all hardware attachments to door with sound grade hardwood. Exterior wood doors are only allowed in residential construction where facility design, overhangs and porches eliminate direct rain/moisture contact from wind driven rain.

B203001 1.2.1 Stile and Rail Doors

Stile and rail doors must be premium or custom grade Ponderosa pine stile and rail doors conforming to WDMA I.S.6A-01, heavy duty.

B203001 1.2.2 Flush Doors

Flush doors must conform to WDMA I.S.1-A.

Exterior Flush Doors - Solid wood core, Type I conforming to WDMA I.S. 1-A.

B203001 1.2.3 Wood Door Louvers

Door louvers must be of the manufacturer's standard design and must transmit a minimum of 35 percent free air. Louver must be a galvanized coated louvers with insect screens and comply with SDI 111-C, must be stationary, sight-proof type. Use lightproof louvers if function of room requires darkness.

B203001 1.2.4 Door Light Openings

Where glazed openings are required, use the manufacturer's standard wood moldings. Moldings for doors to receive a natural finish must be of the same species and color of the face veneer.

B203001 1.2.5 Fabrication

a. Marking - Each door must bear a stamp, brand or other identifying mark indicating quality and construction of the door.
b. Adhesives and Bonds - WDMA I.S. 1-A. Use Type I bond for exterior doors. Adhesive for doors to receive a natural finish must be non-staining.

B203002 GLAZED DOORS

B203002 1.1 ALUMINUM GLAZED DOORS

See B202002 STOREFRONTS, paragraph titled, "Doors and Frames."

B203004 OVERHEAD ROLL-UP AND OVERHEAD SECTIONAL DOORS

Refer to RFP PART 3, Chapter 6 for project specific exterior overhead sectional and roll-up doors system requirements. Do not use exterior roll-up doors as an entrance into conditioned spaces.

B203004 1.1 OVERHEAD ROLL-UP DOORS

Provide overhead doors in accordance with Door and Access Systems Association International (DASMA) requirements. Overhead roll-up doors must conform to ANSI/ DASMA 207. Provide overhead roll-up doors with minimum 22 gage thermal insulated slats, however use door weight, pressure, and width to determine if a heavier gauge slat is required. Electric operators must have protected 3-button switches conforming to NEMA MG 1, NEMA ICS 1, and NEMA ICS 2. Galvanize door and sheet metal components in accordance with ASTM A653. Apply painted coat required in RFP Part 3, Chapter 6, over the galvanizing to all components directly exposed to the weather.

B203004 1.2 OVERHEAD SECTIONAL DOORS

Provide overhead doors in accordance with Door and Access Systems Association International (DASMA) requirements. Overhead sectional doors must conform to ANSI/DASMA 102 Completely close the door opening in the closed position and make the full width and height of the door opening available for use in the open position. Provide a 3 inch (75 mm) track when required by manufacturers standards, or design pressure and forces on the door, or if the door is equal to or greater than 16 feet (4877 mm) high or wide. Design door storage to allow full use of the space around the door for the activities required in the space. Provide a minimum of 16 inches (400 mm) of headroom for 2 inch (50 mm) tracks, 21 inches (525 mm) of headroom for 3 inch (75 mm) tracks, or a high lift type or vertical lift type. If motorized, provide limit switches to automatically stop doors at the fully open and closed positions. Provide readily adjustable limit switch positions.

Doors must remain operable and undamaged after conclusion of tests conducted in accordance with ASTM E 330 using the design wind load. Form steel door sections of hot-dipped galvanized steel not lighter than 16 gage using a flush surface without ribs or grooves. Sections must be not less than 1 3/4 inches (44.50 mm) minimum panel thickness. Provide maximum insulation value to insulate doors as required to meet energy requirements. Cover interior of door sections with steel sheets of not lighter than 24 gauge to completely enclose the insulating material. Provide galvanized steel tracks not lighter than 14 gauge for 2 inch (50 mm) tracks and not lighter than 12 gauge for 3 inch (75 mm) track. Provide a positive locking device and cylinder lock with two keys on manually operated doors. Form aluminum door panels of 0.050 inch (1.3 mm) sheet aluminum and styles and rails of 6063-T6 aluminum. Galvanize door and steel sheet metal components in accordance with ASTM A653.

B203004 1.3 OVERHEAD DOOR FINISH

Finish steel door and components with hot dipped galvanized coating and apply a baked-on primer and topcoat painted finish. If powder coat finish is required in RFP Part 3, Chapter 6, painted system must conform to the following requirements;

a. Outgas Forgiving Primer

b. Film Thickness per ISO 2360 - 2.5-3.5 mils (60-80 Î¼m)

c. Mandrel Bending Test per ASTM D522 - 1/8 inches (3mm)

d. Impact Test per ASTM D2794 - Up to 80 in/lb. Cracking at the perimeter of the concave area

but no cracking pick off

e. Pencil Hardness per ASTM D3363 - 2H minimum.

f. Color Change per ASTM D2244 - â‰¤Î”Îµ 5.0 (Hunter)

g. Gloss Retention per ASTM D523 - >80%

h. Salt Spray Test per ASTM B117 - 3000 hours

B203005 HANGAR DOORS

DOR utilize UFGS Specification Section 08 34 16.10, *Steel Sliding Hangar Doors*, or Specification Section 08 34 16.20, *Vertical Lift Fabric Doors*, for the project specification submittal for the project. Refer to the Project Program for which type of hangar door is used on this project.

B203008 EXTERIOR DOOR HARDWARE

Provide the services of an Architectural Hardware Consultant (AHC), Certified Door Consultant (CDC), or an Electrified Hardware Consultant (EHC) to assist the Designer of Record in preparation of the door hardware schedule and product selection. The hardware consultant must sign and seal the door hardware construction submittal. Provide, as far as possible, door hardware of one manufacturer’s make. All hardware must be clearly and permanently marked by the manufacturer where it will be visible after installation.

B203008 1.1 HINGES

BHMA A156.1, size to match door size, but in no case less than 4-1/2 x 4-1/2 inches (114 mm x 114 mm), with non-removable pin and anti-friction bearing hinges. Use two hinges for doors 60 inches (1500 mm) or less in height and one additional hinge for each additional 30 inches (750 mm), or fraction thereof, in door height.

B203008 1.2 PIVOTS

BHMA A156.4.

B203008 1.3 LOCKS AND LATCHES

Commercial (all construction except family housing) buildings locks and latches must be BHMA A 156.13, Series 1000, Operational Grade 1, Security Grade 2 for exterior building entrances and other high-use doors not requiring exit devices. Use BHMA A 156.2, Series 4000, Grade 1 for all Commercial buildings locks and latches not using Series 1000 hardware.

For Residential (family housing) projects, use Series 4000, Grade 2 hardware.

B203008 1.3.1 Combination Locks for Sensitive Areas and Vault Doors

If required for exterior use, see C102007 1.1.6 "Combination Locks" for the specification. This installation may require special weather protection.

B203008 1.3.2 Pushbutton Combination Locks

Where required, provide a heavy-duty, mechanical combination lockset with 5 pushbuttons, standard-sized knob or lever, 3/4 inch (19 mm) deadlocking latch with 2-3/4 inch (70 mm) back-set. Provide deadbolt key override option. Safelock, Simplex, and Venn are acceptable manufacturers. Provide a hardware grade equivalent to Grade 1, series 4000. Include a 5-year parts and labor warranty.

B203008 1.4 CARD KEY SYSTEM

Where required, provide card key type access units. Provide lithium battery powered, magnetic stripe keycard locksets that are ANSI/BHMA A156.13, Series 1000, Grade 1, mortise or ANSI/BHMA A156.2, Series 4000, Grade 1, cylindrical locks, tamper resistant, UL listed with 1 inch (25 mm) throw deadbolt, 3/4-inch (19 mm) throw latch bolt, auxiliary deadlocking latch, and 2-3/4 inch (68.75 mm) backset. The latch bolt and the dead bolt must be operated simultaneously by rotating inside lever. Locks with mechanical override lock cylinders are not acceptable. Locks must be operated only by a correctly encoded keycard. Use of a newly issued keycard automatically re-keys the lock and voids the previous keycard. The lock must re-lock immediately after outside lever is turned and latch retracted. Locks must have memory that is capable of recording up to 140 entries into each room, identification of the keycard used to access the room, the date and time of entry. Entry information of the lock must be retrievable by a data key that can be inserted into the lock and then taken to the front desk printer to display information. Other components that are required for this system at the front desk are a personal or laptop computer, printer and encoder to program each key.

For exit device locks with card key access, provide mortise type, narrow stile exit devices with 24 volt DC, solenoid option for card key exterior access at aluminum storefront doors. Provide mortise type exit devices with 24 volt DC, solenoid option with alarm and remote exterior access for card key access at insulated hollow metal doors. The alarmed exit device must sound when exiting only.

System must be capable of accepting a minimum of 12 keycard access levels, security auditing and computer interfacing with existing installations management system. Provide a single point of contact customer service representative accessible by telephone with a 10-digit telephone number without additional dialing hierarchies except that a maximum 4-digit extension is permissible. On-site service must be provided within 3 hours from request within the first 12 months of occupancy. Provide a 5-year parts and labor warranty.

B203008 1.5 EXIT DEVICES

BHMA A 156.3, Grade 1. Provide on exit doors if it is anticipated that more than 50 people may use a particular door in an emergency exit situation. Touch bars must be provided in lieu of conventional crossbars and arms. Use manufacturer's integral touch bars in aluminum storefront doors.

B203008 1.6 EXIT LOCKS WITH ALARM

BHMA A 156.5.

B203008 1.7 CYLINDERS AND CORES

If required, provide cylinders and cores for new locks, including locks provided under other sections of this specification. Cylinders and cores must have seven pin tumblers. Cylinders must be products of one manufacturer, and cores must be the products of one manufacturer. Rim cylinders, mortise cylinders, and knobs of bored locksets must have interchangeable cores, which are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core.

B203008 1.8 KEYING SYSTEM

Keying system must be a master key system for the facility, unless more than one tenant/tenant command must reside in a facility, or a grand master keying system, or great, grand master keying system if multiple tenants or buildings are required. The keying system must be an extension of the existing keying system for additions to existing facilities. The keying system must allow for construction interchangeable cores when subcontractors require keys during construction. If required, provide a key cabinet.

The Contractor must coordinate a keying system meeting. The Contractor's Project Manager, Superintendent, Hardware Subcontractor, Electrical Subcontractor (if keying hardware is electric), Designer of Record, Contracting Officer, Public Works Base Hardware Specialist, and the Using Activity must attend this meeting to establish the keying system for the project. This meeting is intended to identify base limitations, the necessary security, and access control within the facility. The meeting must produce a marked up copy of the floor plan indicating the doors to receive locks and the doors to be keyed together, and any master keying or grand master keying.

B203008 1.9 KEYS

Furnish one file key, one duplicate key and one working key for each key exchange and for each master and grand master keying system.

B203008 1.10 LOCK TRIM

Cast, forged or heavy wrought construction and commercial plain in design.

B203008 1.10.1 Knobs and Roses

Knobs and roses must meet test requirements of BHMA A 156.2 and BHMA A 156.13.

B203008 1.10.2 Lever Handles

Provide lever handles in lieu of knobs as required by DoD ABAAS. Lever handles must meet the test requirements of BHMA A 156.13 for mortise locks. All lever handles (mortise or cylinder) must be the freewheeling type.

B203008 1.11 DOOR BOLTS

BHMA A 156.16, Grade 1. Provide two flush bolts for each inactive leaf of a pair of doors.

B203008 1.12 CLOSERS

BHMA A 156.4, Series C02000, Grade 1, with PT 4C, 1-1/2 inch piston, heavy duty forged arm, full size case. Provide closers for all exterior doors, fire-rated doors, corridor doors, stairway doors, and secure area doors, for non-residential (commercial) construction, as a minimum.

B203008 1.13 OVERHEAD HOLDERS

BHMA A 156.8, Grade 1. Provide for exterior doors for non-residential (commercial) construction.

B203008 1.14 DOOR PROTECTION PLATES

Kick plates must conform to BHMA A 156.6. Provide kick plates on all doors with closers and all doors leading to corridors or circulation spaces. Provide armor plates on all doors to receive cart traffic. Provide mop plates on all doors in rooms with a mopable floor finish that do not have kick plates.

B203008 1.15 DOOR STOPS AND SILENCERS

BHMA A 156.16. Provide silencers, Type L03011, three per single door and four per double door, for doors in hollow metal frames.

B203008 1.16 THRESHOLDS

BHMA A 156.21. Provide thresholds with offset to stop water infiltration, while maintaining accessibility requirements.

B203008 1.17 WEATHERSTRIPPING

BHMA A 156.22. Air leakage of weatherstripped doors must not exceed 0.5 CFM of air per square foot of door for residential doors, and 1.25 CFM for non-residential doors (unless a more restrictive infiltration level is specified).

B203008 1.18 RAIN DRIPS

For all exterior doors that open to the outside, where the door swing area is not covered by an overhang, provide top and bottom rain drips complying with ANSI R3Y535 as a minimum. Greater weathersealing may be required by the geographic location of the project.

B203008 1.19 FINISHES

One of the following hardware finish systems must be provided, and match the interior door hardware:

a. BHMA A156.18. Hardware must have BHMA 630 finish (satin stainless steel), unless specified otherwise. Provide items not manufactured in stainless steel in BHMA 626 finish (satin chromium plated) over brass or bronze, except surface door closers which must have aluminum paint finish, and except steel hinges which must have BHMA 652 finish (satin chromium plated). Hinges for exterior doors must be stainless steel with BHMA 630 finish or chromium plated brass or bronze with BHMA 626 finish. Exit devices may be provided in BHMA 626 finish in lieu of BHMA 630 finish. Exposed parts of concealed closers must have finish to match lock and door trim. Hardware for aluminum doors must be finished to match the doors.

b. BHMA A156.18. Hardware must have BHMA 612 finish (satin bronze), unless specified otherwise. Surface door closers must have bronze paint finish. Steel hinges must have BHMA 639 finish (satin bronze plated). Exposed parts of concealed closers must have finish to match lock and door trim. Hardware for aluminum doors must be finished to match the doors. Hardware showing on interior of bathrooms, shower rooms, toilet rooms, washrooms, laundry rooms, and kitchens must have BHMA 629 finish (bright stainless steel) or BHMA 625 finish (bright chromium plated).

B203090 OTHER EXTERIOR SPECIALTY DOORS

Where required, provide special function exterior doors and gates and assemblies required for the proper operation and functioning of the facility. Exterior doors system may include factory-finished or painted doors and frames.

B203090 1.1 AUTOMATIC ENTRANCE DOORS

B203090 1.1.1 Automatic Swinging Entrance Door Controller

Automatic swinging entrance doors must be glazed aluminum doors and frames as specified in this section. Controller must be a dual function safety device that utilizes planar K-band microwave motion detectors and active infrared presence sensors at each door to protect individuals in the path of the swinging door. The planar K-band motion detector must be capable of sensing an individual moving as slow as 2.2 inches (55.8 mm) per foot. The infrared sensors must employ both diffused presence sensors that see through the plane of the door, and distance measuring sensors. The infrared sensors must constantly remain in operation. The safety device must call for reactivation or creep closing function, depending on the location of the sensor. If the sensor is located on the swing side, it will call for reactivation; if it is located on the pull side, it will call for creep closing function. Sensing system must be fully adjustable with a universal remote control, and meet or exceed the requirements of ANSI A156.10. System must include aluminum guard rails and signage for additional personnel safety.

B203090 1.1.2 Automatic Sliding Entrance Door Controller

Automatic sliding entrance doors must be glazed aluminum doors and frames as specified in this section. Controller must be a dual function safety device that utilizes planar K-band microwave motion detectors and focused active infrared presence sensors at each door to protect individuals in the path of the sliding door. The planar K-band motion detector must be capable of sensing an individual moving as slow as 2.2 inches (55.8 mm) per foot. The focused active infrared sensors must overlap their patterns for full coverage of the motion pattern and extend its range all the way to the floor surface. The infrared sensors must constantly remain in operation even when the door is in the closing cycle. Door and frame must have a "break-away" feature that allows the door to be pushed open in an emergency exit situation.

-- End of Section --

SECTION B30

ROOFING
09/15

B30 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

B30 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards that are referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

B30 1.1.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01 ArchitectureUFC 3-110-03 Roofing)
UFC 1-200-02	High Performance and Sustainable Buildings

B30 1.1.2 Design Requirements

Wind Uplift Resistance: Determine the required wind uplift resistance based on ASCE 7 wind loading calculations or applicable building code requirements and UFC 3-301-01 *Architecture*and UFC 3-110-03 *Roofing*. The specified FM rating incorporates a safety factor of 2 over the maximum calculated uplift pressure. Therefore, a FM rating of 1-90 correlates to a maximum uplift calculation of 2.2 kPa, 45 psf. When

a rated system is specified, ensure the specified roof system is capable of meeting the wind uplift resistance specified. Where non-rated systems may be allowed and used, delineate calculated values in the roof specification or drawings. Utilize independently tested and rated roof systems, such as Factory Mutual (FM), Underwriters Laboratory (UL), and Single Ply Roofing Industry (SPRI).

The complete roof system assembly shall be rated and installed to resist wind loads calculated in accordance with ASCE 7 and validated by uplift resistance testing in accordance with Factory Mutual (FM) test procedures. Non-rated systems must not be installed, except as approved by the Contracting Officer. Submit licensed engineer's wind uplift calculations and substantiating data to validate any non-rated roof system.

B30 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory roofing system performance shall be via Performance Verification Testing, and by field inspection as detailed in this section of the RFP. All performance and acceptance testing including final/warranty inspections shall be witnessed by the Contracting Officer on all significant roof projects.

A significant roof is defined as a single or group of buildings with greater than 15,000 square feet (1,400 m2) of roof area; or a roof with area that is allocated to energy generating equipment such as solar hot water panels or photovoltaic panels; or where building equipment (excluding HVAC), use, or safety causes multiple roof penetrations.

B30 1.2.1 Pre-Roofing Design Conference

If the project roof meets the definition of a significant roof above, provide a Pre-Roofing Design Conference. Schedule this conference prior to the roof design and roof layout of the facility. Attendee's shall include the DOR, DQC Manager, Roof Design Assurance Consultant (if applicable), Commissioning Authority, and Subcontractors directly responsible for installing the roof and equipment that will be mounted on the roof. Discuss and coordinate the following as a minimum:

a. Renewable energy systems to be mounted on the roof and interface with building systems and utilities,
b. Allocation of space on the roof for different functions,
c. Impact of renewable energy systems and building orientation to the suns path,
d. Waterproofing, flashing, and future reroofing considerations of the facility resulting from renewable energy systems inclusion on the roof,
e. Measures taken to eliminate penetration of the roof membrane. NRCA roof details proposed for each necessary penetration,
f. Structural requirements to support roof mounted equipment,
g. Aesthetic impact of roof mounted equipment on the facility and measures taken to mitigate negative appearances of equipment.
h. Maintenance and Commissioning requirements of the roof and roof mounted equipment to facilitate final testing and provide proper access and roof membrane protection.

B30 1.2.2 Pre-Roofing Conference

Prior to beginning roofing work, the Contractor shall hold a Pre-Roofing Conference with the Contracting Officer. Attendees' shall include personnel directly responsible for the roofing systems design and construction, DQC Manager, Commissioning Authority, as well as the roofing manufacturer's technical representative, and Roof Design Consultant (if applicable). At this time the Contractor will address any conflicts between the proposed roofing system, the design documents, and the scheduling of work / workers (trades) to assure a watertight roofing installation. Resolutions will be obtained and documented in writing prior to the start of roofing work. A quality assurance/quality control plan shall also be established at this time, inclusive of the roofing manufacturer's recommended testing and inspections procedures, and in accordance with industry standard guidelines.

Contractor shall provide the following additional information at the pre-roofing conference: Procedure for the roof manufacturer’s technical representative's onsite inspection and acceptance of the roofing substrate, roof insulation, and installation of the roofing in accordance with the roof system warranty, the name of the manufacturer's technical representatives, the frequency of the onsite visits, copies of the roof status reports from the technical representatives to the roof manufacturer, and pertinent structural details to the roofing system.

B30 1.2.3 Roof Design Assurance

If the project roof meets the definition of a significant roof above, the Contractor must utilize the services of a Registered Roof Consultant (RRC) certified by the Roof Consultant Institute, or a Registered Professional Architect or Engineer who specializes in roofing, to approve the roof design. The roof consultant must derives his or her principal income from roofing design on the quality control staff of the Design or Design-Build team. The roof consultant must verify in writing that the design for the project is in accordance with the current edition of NRCA *Roofing and Waterproofing Manual*, UFC 3-110-03, the RFP, and standard industry practices and building codes.

B30 1.2.4 Low Slope Roof Drain Test

Plug roof drains and fill with water to the edge of the drain sump for 24 hours. Not all drains shall be tested at one time. Measure water at the beginning and end of the 24 hour time period to ensure there is no leakage. Repeat testing until all leaks have been located, corrected, and no leaks found.

B30 1.2.5 Tests for Surface Dryness

Prior to application of roofing materials, perform surface dryness tests in presence of DOR. Asphalt of 350 to 400 degrees F (177 to 204 degrees C) shall not foam upon contact with substrate. After foaming test is performed, test for strippability (adherence).

B30 1.2.6 Quality Control Program

Contractor shall establish a quality control program to assure adherence to NRCA recommended Quality Control Guidelines for the Application of Roofing Systems and other specified application requirements. Compliance with UFGS Section 01 45 00.05 20, *Design and Construction Quality Control*, is required.

B30 1.3 DESIGN SUBMITTALS

Design submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures,*UFC 3-101-01, *Architecture* and UFC 3-110-03, *Roofing*.

B30 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following submittals as a minimum:

Test reports, color samples, certificates of conformance, warranties, close out documentation, and manufacturer's instructions for application and installation on all products used on the roof. Products used on the roof consist of but are not limited to structural deck, insulation, membrane or panels, Standing Seam Metal Roofing (SSMR), flashing, fasteners, nailers, accessories and equipment support curbs or equipment support stands for solar equipment, equipment roof plan, maintenance access and paths.

B3010 ROOF COVERINGS

Roof coverings shall comply with the requirements of UFC 3-110-03, *Roofing*, and NRCA, *Roofing and Waterproofing Manual*found at http://www.nrca.net/rp/technical/manual/manual.aspx as the primary NAVFAC roofing criteria. Determine wind uplift using wind speed in accordance with ASCE-7.

Submit the INFORMATION CARD (see "Form 1" at the end of this section) Provide a typewritten card, laminated in plastic and framed in a weather-tight frame, or a photoengraved 0.032-inch (0.81 mm) thick aluminum card for the roof. This card shall be a minimum size of 8 1/2 x 11 inch (216 x 280 mm) and contain information listed in the attached Form 1. Install the card where directed. Furnish framed card and a duplicate card to the Designer of Record.

B301001 STEEP SLOPE ROOF SYSTEMS

Slope conversions from low slope to steep slope roofing systems must specifically address temporary waterproofing protection where new framing connections penetrate the existing low slope system.

B301001 1.1 SLATE ROOFING

Slate roofing systems shall be installed in accordance with NRCA Standards.

B301001 1.1.1 Warranty

Contractor shall supply manufacturer's standard warranty against defects in product workmanship and materials, including related metal flashing for a period of 30 years from the date of FINAL acceptance of the work.

B301001 1.1.2 Materials

a. Slate - Slate materials shall meet the grading standards of the National Slate Association. Field punching of slate shall be from the back of the slate.
b. Underlayment Membrane - For standard slate roofs, roofing felts shall be un-perforated asphalt-saturated felts, No. 30 or heavier. For graduated slate roofs, two layers of felts shall be applied with joints and laps staggered. When roof slopes are less than 4:12, a double layer of felt shall be applied in mastic or hot asphalt shall be applied. At the roofing perimeter, eaves, rakes, sidewalls, head walls, valleys and all penetrations, install self-adhering membrane (3 foot band minimum) (900 mm band minimum).
c. Fastening - Nails shall be stainless steel or copper ring shank nails. Nails shall be long enough to penetrate the roof sheathing with heads of sufficient diameter to prevent pullover of slate. Slate shall hang on the shaft of the fastener, and drawn to, but not tight against the slate surface. Exposed nails on the top courses shall be sealed. In high wind areas, provide mechanical fastening plus sealant adhesive attachment. Provide screws, wire ties, hook nails, tile locks and storm clips of brass, copper or stainless steel as recommended by the manufacturer for the project.
d. Flashing - Flashings for slate roofing shall be 16 oz. (454 g) copper or 24 gage stainless steel, and 16 oz. (454 g) lead-coated copper, and shall be protected to prevent the potential for galvanic action by having contact with dissimilar metals.
e. Snow Guards - Provide snow guards of type compatible with roof system specified, and designed to meet design loads for the project location.

B301001 1.2 ASPHALT SHINGLES

The shingle roofing system shall be installed in accordance with NRCA *Roofing and Waterproofing Manual*(Latest Edition), "Steep Roofing", closed cut valley flashing shall not be allowed and per ASTM D 3462.

B301001 1.2.1 Warranties

The contractor shall furnish to the Government the manufacturer's standard lifetime material warranty for the asphalt shingles. The Contractor shall also warrant that the asphalt shingle roofing system, as installed, is free from defects in workmanship. Provide a minimum 10-year fungus resistance warranty in southern climate and areas susceptible to fungus growth on shingles.

B301001 1.2.2 Materials

a. Shingles - Shingles shall meet ASTM D 3018, Type I, and ASTM

D 3462, and shall weigh not less than 210 pounds per 100 square feet (95 kg per 9.3 square meters). Shingles shall meet the fire resistance requirements of UL 790 for Class 'A' and resist winds in accordance with ASCE-7 when tested in accordance with UL 997.

b. Shingle Underlayment - Asphalt-saturated felt conforming to ASTM D 226, Type I.

c. Self-Adhering Membrane - Self-adhering rubberized asphaltic membrane, a minimum of 40 mils thick. Provide at all ridges, valleys, sidewalls and starter strips.

d. Nails - 11 or 12 gauge hot-dipped galvanized steel, corrosion resistant roofing nails, with sharp points and flat heads 3/8 inch to 7/16 inch (9.5 mm to 11 mm) diameter. Shank diameter shall be a minimum of 0.105 inch (2.7 mm) to a maximum of 0.135 inch (3.4 mm). Nails shall be long enough to penetrate through all layers of roofing materials and achieve secure anchorage into a roof deck. A minimum of 4 nails shall be used on a full width shingle, and six nails in high wind areas. Location of nails shall be as shown in manufacturers printed installation instructions. Staples are not permitted as a means of attachment.

e. Asphalt Roof Cement - ASTM D 4586, Type II

f. Asphalt Primer - ASTM D 41

B301001 1.3 ROOF TILES

B301001 1.3.1 Warranty

The contractor shall warrant for 30 years that the tile roofing system, as installed, is free from defects in workmanship.

B301001 1.3.2 Materials

a. Clay Tile - ASTM C 1167, machine-formed natural clay tiles, kiln-fired to vitrification and free from surface imperfections. Provide specially shaped units as required to provide watertight installation and closure. Form fastening holes prior to firing.

b. Concrete Tile - ASTM C 1492, molded or extruded, interlocking concrete roofing tile units, and specially shaped as required to provide a watertight installation and closure. Provide with cast-in anchor lugs, transverse weather checks and fastening holes.

B301001 1.3.3 Underlayment

Underlayment type shall be determined by slope as follows:

10:12 slope and above shall have a minimum of one layer of number 30 felt, laid in shingle fashion with a minimum of a 2 inch (50 mm) lap.

4:12 to 10:12 slopes shall have a minimum of 2 layers of number 30 felt or one layer of a modified bitumen underlayment for use

with standard size tile as long as tile is laid with a minimum of a 3 inch (75 mm) headlap. Underlayment shall be laid shingle fashion with a 19-inch (480 mm) lap.

Tiles shall not be laid on slopes less than 4:12.

a. Felt Underlayment - Asphalt saturated felt conforming to ASTM D 226, Type I.
b. Flexible Hip, Starter and Ridge Flashing - Provide SBS Modified rubberized asphalt adhesive on a linear, low-density polyethylene membrane with a 60 mil total thickness, or 40 mil thick self-adhered membrane underlayment in accordance with ASTM D 1970. At the roofing perimeter, eaves, rakes, sidewalls, head walls, valleys and all penetrations, install self-adhering membrane (3 foot (900 mm) band minimum).

B301001 1.3.4 Substrate Panels for Application Over Metal Deck

a. Glass Mesh Mortar Units - ASTM E 84, exterior type panels of Portland cement.
b. Fiberglass-Faced Gypsum Roof Board - ASTM 1177/C 1177M

B301001 1.3.5 Fasteners

a. Nails for Applying Felt Underlayment - Hot dip galvanized steel, 11 gage, of sufficient length to penetrate through substrate panels.
b. Materials for Installation of Tile - Nails shall be round-head, sharp point, 11 or 12 gauge, copper or stainless steel ring shank roofing nails. Nail heads shall be low profile, smooth and flat. Shanks may be smooth, barbed or otherwise deformed for added pull out resistance. Nails should be of sufficient length to penetrate one inch (25 mm) into wood ridge and hip boards, or battens, with heads of sufficient size to prevent pullover of the tile.
1) Wind Locks shall be of 10 gage copper or brass, 12 gage galvanized steel, or 0.084 inch (2.1 mm) stainless steel formed wire clips.

2) Provide hurricane clips with two nail holes in the horizontal leg for anchorage to deck or substrate.

3) Provide dual means of attachment of tile as follows, or as recommended by the tile manufacturer: Mechanical fastening plus hurricane clips, mechanical fastening plus foam setting, mechanical fastening plus sealant adhesive attachment of tile to tile in headlap areas.

B301001 1.3.6 Preservative-Treated Lumber - AWPA C1

B301001 1.3.7 Sheet Metal Flashing and Trim

Fabricate sheet metal flashing and trim of 20 oz. Copper, lead-coated copper or stainless steel to comply with SMACNA *Architectural Sheet Metal Manual*.

B301001 1.3.8 Bird-stop for Concrete Tile

Provide 20 oz.(567 g) copper, lead or stainless steel "L" section with 3-inch (75 mm) wide horizontal leg and vertical leg cut to conform to bottom profile of tile, or provide mortar formed bird-stops with weep holes, molded plastic bird-stops, or prefabricated tiles as recommended by roofing tile manufacturer.

B301001 1.3.9 Mortar

ASTM C 270, Type M mortar mix. Mortar set tile shall not be used in high-wind areas.

B301001 1.3.10 Asphaltic Plastic Cement

ASTM D 4586.

B301001 1.3.11 Foam-set Tile

Provide foam plastic adhesive designed to meet the concrete and clay tile roofing industries requirements for adhering roofing tile to specified roof underlayment assemblies. Foam adhesive shall meet ASTM E 84, with a flame spread of less than 75. When tested in accordance with ASTM E 108, the roof covering system shall qualify as a Class 'A' roof covering system.

B301001 1.4 METAL ROOF PANELS (ARCHITECTURAL STANDING SEAM METAL ROOFS ON SUPPORTED SUBSTRATE)

B301001 1.4.1 Manufactured Sheet Metal Roofing

Provide galvanized steel or aluminum-zinc coated steel or aluminum panels formed at the manufacturing plant and conditioned for flatness. Panel thickness shall be determined by the requirements of NRCA, *Roofing and Waterproofing Manual*, but not less than 24 gauge for panels less than 16 inches wide (400 mm), and 22 gauge for panels 16 inches (400 mm) wide or greater. All panels greater than 12 inches (300 mm) wide shall have preformed reinforcing ribs or embossed for stiffening. The minimum gauge for aluminum panels shall be 20-gauge, .032 inch thick (.8 mm thick) or greater. Roofing design shall meet deflection and wind load requirements per building code.

The SSMR system covered under this specification shall include the entire roofing system; the standing seam metal roof panels, fasteners, connectors, roof securement components, and assemblies tested and approved in accordance with ASTM E 1592. In addition, the system shall consist of panel finishes, slip sheet, insulation, vapor retarder, all accessories, components, and trim and all connections with roof panels. This includes roof penetration items such as vents,

curbs, skylights; interior or exterior gutters and downspouts; eaves, ridge, hip, valley, rake, gable, wall, or other roof system flashings installed and any other components specified within this contract to provide a weathertight roof system.

a. Provide inverted "L" Standing Seam shape roofing panels.
b. Panel Protection - Treat exposed cut edges with compatible coating comparable to the factory applied coating system for corrosion protection.
c. Sealants - Provide non-curing, non-skinning butyl based sealants and tapes for concealed locations such as within laps and under eaves. Provide polyurethane and curing butyl elastomeric sealants for exposed locations such as along top edge of surface mounted counter flashings.
d. Factory Color Finish - Provide factory applied, baked coating to the exterior and interior of metal wall panels and metal accessories. Provide exterior finish top coat of 70 percent polyvinylidene fluoride resin with not less than 0.8 mil dry film thickness. Provide exterior primer standard with panel manufacturer with not less than 0.8 mil dry film thickness. Interior finish shall consist of 0.5 mil dry film thick backer coat if permanently concealed from view by construction or the same coating and dry film thickness as the exterior coating if the panel interior side will be exposed. Provide factory-applied clear 70 percent PVF, 0.8 mil top coat and edge coating on all factory-cut or unfinished panel edges for projects within 300 feet (91 meters) of the ocean or industrial environments.
e. Warranty - Furnish manufacturer's no dollar limit materials and workmanship warranty for the roofing system. The warranty period shall be not less than 20 years from the date of Government acceptance of the work. The warranty shall be issued directly to the Government. The warranty shall provide that if within the warranty period the metal roofing system becomes non-watertight or shows evidence of corrosion, perforation, peeling paint, rupture or excess weathering due to deterioration of the roofing system resulting from defective materials or workmanship the repair or replacement of the defective materials and correction of the defective workmanship shall be the responsibility of the roofing system manufacturer. Repairs that become necessary because of defective materials and workmanship while roofing is under warranty shall be performed within 7 days after notification, unless additional time is approved by the Contracting Officer. Failure to perform repairs within the specified period of time will constitute grounds for having the repairs performed by others and the cost billed to the manufacturer. The Contractor shall also provide a 2 year contractor installation warranty. Coating shall not show a color change greater than 5 NBS color units per ASTM D2244, and not show chalking in excess of 10 per ASTM D4214.
f. Wind Uplift - Metal roofing systems shall be designed and attached to resist wind uplift pressures calculated in accordance with ASCE 7. Uplift resistance shall be validated by applicable Factory Mutual (FM), Underwriters Laboratories (UL), or ASTM uplift resistance test procedures.

B301001 1.4.2 Metal Roof Design Requirements

The design of the SSMR system shall be provided by the Contractor as a complete system. Roof panels, components, transitions, accessories, and assemblies shall be supplied by the same roofing system manufacturer. Provide to the DOR a design analysis signed by a Registered Professional Engineer employed by the SSMR manufacturer. The design analysis shall include a list of the design loads, and complete calculations for the roofing system and its components; valley designs, gutter/downspout calculations, screw pullout test results, and shall indicate how expected thermal movements are accommodated.

B301001 1.4.3 Accessories

Provide other sheet metal flashings, trim moldings, closure strips, caps and other preformed metal panel accessories, of the same material, thickness and finish as panels, except accessories that are concealed after installation, and are aluminum or zinc-coated steel may be provided unfinished. Provide molded closure strips of closed-cell or solid-cell synthetic rubber, neoprene, or polyvinyl chloride premolded to match configurations of preformed metal panels. All accessories shall be manufactured or approved by the roof panel manufacturer.

B301001 1.4.4 Fasteners

Provide concealed fasteners for attaching panels to structural supports and to adjoining panels as approved and in accordance with printed manufacturer's recommendations.

B301001 1.4.5 Field Quality Control

Install in accordance with the approved manufacturer's erection instructions, shop drawings, and diagrams. Panels shall be in full and firm contact with attachment clips. Where prefinished panels are cut in the field, or where any of the factory applied coverings or coatings are abraded or damaged in handling or installation, they shall, after necessary repairs have been made with material of the same color as the weather coating, be approved before being installed. Seal openings through panels. Correct defects or errors in the materials. Replace materials which cannot be corrected in an approved manner with nondefective materials. Provide molded closure strips where necessary to provide weathertight construction. Use shims as required to ensure attachment clip line is true. Use a spacing gage at each row of panels to ensure that panel width is not stretched or shortened. Provide 30 pound layer of asphalt-saturated felt placed perpendicular to roof slope, covered by a slip sheet. Overlap side and end laps 75 mm 3 inches, offset seams in building paper with seams in felt.

Apply roofing panels with the standing seams parallel to the slope of the roof. Provide roofing panels in longest practical lengths from ridge to eaves (top to eaves on shed roofs), with no transverse joints except at the junction of ventilators, curbs, and similar openings. Install flashing to assure positive water drainage away from roof

penetrations. Locate panel end laps such that fasteners do not engage supports or otherwise restrain the longitudinal thermal movement of panels. Attach panels to the structure with concealed clips incorporated into panel seams. Clip attachment shall allow roof to move independently of the structure, except at fixed points as necessary.

B301001 1.5 STRUCTURAL METAL ROOFING SYSTEM

B301001 1.5.1 Structural Standing Seam Metal Roof (SSSMR) System

The SSSMR system covered under this specification shall include the entire roofing system; the standing seam metal roof panels, fasteners, connectors, roof securement components, and assemblies tested and approved in accordance with ASTM E 1592. In addition, the system shall consist of panel finishes, slip sheet, insulation, vapor retarder, all accessories, components, and trim and all connections with roof panels. This includes roof penetration items such as vents, curbs, skylights; interior or exterior gutters and downspouts; eaves, ridge, hip, valley, rake, gable, wall, or other roof system flashings installed and any other components specified within this contract to provide a weathertight roof system.

B301001 1.5.2 Design Requirements

The design of the SSSMR system shall be provided by the Contractor as a complete system, in accordance with ASCE 7. Framing members and connections not indicated on the drawings shall be designed by the Contractor. Roof panels, components, transitions, accessories, and assemblies shall be supplied by the same roofing system manufacturer. Provide to the DOR a design analysis signed by a Registered Professional Engineer employed by the SSSMR manufacturer. The design analysis shall include a list of the design loads, and complete calculations for the support system (when provided by the Contractor), roofing system and its components; valley designs, gutter/downspout calculations, screw pullout test results, and shall indicate how expected thermal movements are accommodated.

a. Dead Loads - The dead load shall be the weight of the SSSMR system. Collateral loads such as sprinklers, mechanical and electrical systems, and ceilings shall not be attached to the panels.
b. Concentrated Loads - The panels and anchor clips shall be capable of supporting a 300 pound concentrated load. The concentrated load shall be applied at the panel mid-span and will be resisted by a single standing seam metal roof panel assumed to be acting as a beam. The un-deformed shape of the panel shall be used to determine the section properties.
c. Uniform Loads - The panels and concealed anchor clips shall be capable of supporting the minimum uniform live load specified in the project program.
d. Roof Snow Loads - The design roof snow loads shall be shown on the contract drawings.
e. Wind Loads - The design wind uplift pressure for the roof system shall be shown on the contract drawings. The design uplift force for each connection assembly shall be that pressure given

for the area under consideration, multiplied by the tributary load area of the connection assembly. The safety factor listed below shall be applied to the design force and compared against the ultimate capacity. Prying shall be considered when figuring fastener design loads.

1) Single fastener in each connection.....3.0

2) Two or more fasteners in each connection...2.25

f. Framing Members Supporting the SSSMR System - New or revised framing members and their connections shall be designed in accordance with AISC 335, AISI SG-973, or SJI Specs & Tables. Maximum deflection under applied live load, snow, or wind load shall not exceed 1/180 of the span length.

g. Roof Panels Design – Deflections shall be based on panels being continuous across three or more supports. Deflection shall be calculated and measured along the major ribs of the panels.

1) Steel panels shall be designed in accordance with AISI SG-973.

2) Aluminum panels shall be designed in accordance with AA ADM. The panel deflection from concentrated loads shall not exceed 1/180 of the span length. The panel deflection under applied live load, snow, or wind load shall not exceed 1/180 times the span length.

B301001 1.5.3 Performance Requirements

a. The SSSMR shall be tested for wind uplift resistance in accordance with ASTM E 1592; SSSMR systems previously tested and approved may be acceptable.

b. SSSMRS Warranty Certificate -- At the completion of the project the Contractor shall furnish signed copies of the 5-year Warranty for Structural Standing Seam Metal Roof (SSSMR) System, a sample copy of which is attached to this section, and the 20-year Manufacturer's Material Warranties, and the manufacturer's 20-year system weather-tightness warranty.

1) Contractor's Weather-tightness Warranty

The SSSMR system shall be warranted by the Contractor on a no penal sum basis for a period of five years against material and workmanship deficiencies; system deterioration caused by exposure to the elements or inadequate resistance to specified service design loads, water leaks, and wind uplift damage. The SSSMR system covered under this warranty shall include the entire roofing system including, but not limited to, the standing seam metal roof panels, fasteners, connectors, roof securement components, and assemblies tested and approved in accordance with ASTM E 1592. In addition, the system shall consist of panel finishes, slip sheet, insulation, vapor retarder, all accessories, components, and trim and all connections with roof panels. This includes roof penetration items such as vents, curbs, and skylights; interior or exterior gutters and downspouts; eaves, ridge, hip, valley, rake, gable, wall, or other roof system flashings installed and any other

components specified within this contract to provide a weathertight roof system; and items specified in other sections of these specifications that are part of the SSSMR system. All material and workmanship deficiencies, system deterioration caused by exposure to the elements /or inadequate resistance to specified design loads, water leaks and wind uplift damage shall be repaired as approved by the DOR. See the attached Contractor's required warranty for issue resolution of warrantable defects. This warranty shall warrant and cover the entire cost of repair or replacement, including all material, labor, and related markups. The Contractor shall supplement this warranty with written warranties from the installer and system manufacturer, which shall be submitted along with Contractor's warranty; however, the Contractor shall be ultimately responsible for this warranty

2) Manufacturer's Material Warranties

The Contractor shall furnish, in writing, the following manufacturer's material warranties which cover all SSSMR system components such as roof panels, anchor clips and fasteners, flashing, accessories, and trim, fabricated from coil material:

a) A manufacturer's 20 year material warranty warranting that the aluminum, zinc-coated steel, aluminum-zinc alloy coated steel or aluminum-coated steel as specified herein will not rupture, structurally fail, fracture, deteriorate, or become perforated under normal design atmospheric conditions and service design loads. Liability under this warranty shall be limited exclusively to the cost of either repairing or replacing nonconforming, ruptured, perforated, or structurally failed coil material.

b) A manufacturer's 20 year exterior material finish warranty on the factory colored finish warranting that the finish, under normal atmospheric conditions at the site, will not crack, peel, or delaminate; chalk in excess of a numerical rating of eight, as determined by ASTM D 4214 test procedures; or change color in excess of five CIE or Hunter Lab color difference (delta E) units in accordance with ASTM D 2244. Liability under this warranty is exclusively limited to refinishing with an air-drying version of the specified finish or replacing the defective coated material.

c) A roofing system manufacturer's 20 year, non-prorated, system weathertightness warranty.

B301001 1.5.4 Roof Panels

Panels shall be steel or aluminum and shall have a factory color or mill finish. Length of sheets shall be sufficient to cover the entire length of any unbroken roof slope for slope lengths that do not exceed 30 feet. When length of run exceeds 30 feet and panel laps are provided, each sheet in the run shall extend over three or more supports. Sheets longer than 100 feet may be furnished if approved by the DOR. Width of sheets shall provide not more than 24 inches of coverage in place. SSSMR system with roofing panels greater than 12 inches in width shall have standing seams rolled during installation by an electrically

driven seaming machine.

a. Steel panels

1) Steel panels shall be zinc-coated steel conforming to ASTM A 653/A 653M; aluminum-zinc alloy coated steel conforming to ASTM A 792/A 792M, AZ 55 or 50 coating; or aluminum-coated steel conforming to ASTM A 463/A 463M,Type 2, coating designation T2 65. Zinc, zinc-aluminum alloy or aluminum coated panels shall be 0.023 inch (0.584 mm) thick minimum. Panels shall be within 95 percent of reported tested thickness as noted in wind uplift resistance testing required in paragraph "PERFORMANCE REQUIREMENTS".

2) Prior to shipment, if the panels are not specified with a factory color finish, mill finish panels shall be treated with a passivating chemical to inhibit the formation of oxide corrosion products. Panels that have become wet during shipment and have started to oxidize shall be rejected.

b. Aluminum Panels - Alloy conforming to ASTM B 209, temper as required for the forming operation, minimum 0.032 inch thick.

B301001 1.5.5 Concealed Anchor Clips

Concealed anchor clips shall be the same as the tested roofing system.

B301001 1.5.6 Accessories

Flashing, trim, metal closure strips, caps and similar metal accessories shall be the manufacturer's standard products. Exposed metal accessories shall be finished to match the panels furnished.

B301001 1.5.7 Fasteners

Fasteners for steel roof panels shall be zinc-coated steel, aluminum, corrosion resisting steel, or nylon capped steel, type and size specified below or as otherwise approved for the applicable requirements. Fasteners for aluminum roof panels shall be aluminum or corrosion resisting steel. Fasteners for structural connections shall provide both tensile and shear ultimate strengths of not less than 750 pounds per fastener. Exposed roof fasteners shall be sealed or have sealed washers on the exterior side of the roof to waterproof the fastener penetration. Washer material shall be compatible with the roofing; have a minimum diameter of 3/8 inch for structural connections; and gasketed portion of fasteners or washers shall be neoprene or other equally durable elastomeric material approximately 1/8 inch thick. Exposed fasteners for factory color finished panels shall be factory finished to match the color of the panels.

a. Screws - Screws for attaching anchor devices shall be not less than No. 14
b. Bolts - Bolts shall be not less than 1/4 inch diameter, shouldered or plain shank as required, with locking washers and nuts.
c. Structural Blind Fasteners - Blind screw-type expandable

fasteners shall be not less than 1/4 inch diameter. Blind (pop) rivets shall be not less than 9/32 inch minimum diameter.

B301001 1.5.8 Sub-purlins

Cold formed supporting structural members/sub-purlins shall have a minimum thickness of 0.059 inches and a minimum tensile yield strength of 50000 psi. Hot rolled structural members shall have a minimum thickness of 0.25 inches and a minimum tensile yield strength of 36000 psi. Sub-purlins shall be galvanized or shop painted, as required by the project program.

B301001 1.5.9 Factory Color Finish

Panels shall have a factory applied polyvinylidene fluoride finish on the exposed side. The exterior finish shall consist of a baked-on topcoat with an appropriate prime coat. The exterior coating shall be a nominal 2 mil thickness consisting of a topcoat of not less than 0.7 mil dry film thickness and the paint manufacturer's recommended primer of not less than 1.0 mil thickness. The interior color finish shall consist of the same coating and dry film thickness as the exterior. The exterior color finish shall meet the test requirements specified below.

a. Salt Spray test - A sample of the sheets shall withstand a cyclic corrosion test for a minimum of 2016 hours in accordance with ASTM D 5894, including the scribe requirement in the test. Immediately upon removal of the panel from the test, the coating shall receive a rating of not less than 10, no blistering, as determined by ASTM D 714; 10, no rusting, as determined by ASTM D 610; and a rating of 6, over 21/16 to 1/8 inch failure at scribe, as determined by ASTM D 1654.
b. Formability Test - When subjected to testing in accordance with ASTM D 522 Method B, 1/8 inch diameter mandrel, the coating film shall show no evidence of cracking to the naked eye.
c. Humidity Test - When subjected to a humidity cabinet test in accordance with ASTM D 2247 for 1000 hours, a scored panel shall show no signs of blistering, cracking, creepage or corrosion.
d. Impact Resistance - Factory-painted sheet shall withstand direct and reverse impact in accordance with ASTM D 2794 0.500 inch diameter hemispherical head indenter, equal to 1.5 times the metal thickness in mils, expressed in inch-pounds, with no cracking.
e. Abrasion Resistance Test - When subjected to the falling sand test in accordance with ASTM D 968, Method A, the coating system shall withstand a minimum of 2.83 cubic feet (80 liters) of sand before the appearance of the base metal. The term "appearance of base metal" refers to the metallic coating on steel or the aluminum base metal.
f. Specular Gloss - Where considerations for flight line visibility (or other considerations) mandate, finished roof surfaces shall have a specular gloss value of 10 or less at an angle of 85 degrees or 30 plus or minus the value specified in the project program at 60 degrees when measured in accordance with ASTM D 523.
g. Pollution Resistance - Coating shall show no visual effects when

covered spot tested in a 10 percent hydrochloric acid solution for 24 hours in accordance with ASTM D 1308.

B301001 1.5.10 Insulation

Thermal resistance of insulation shall be not less than the R-values shown on the contract drawings. R-values shall be determined at a mean temperature of 75 degrees F in accordance with ASTM C 518.

a. Polyisocyanurate Rigid Board Insulation for Use Above a Roof Deck - Polyisocyanurate insulation shall conform to ASTM C 1289, Type II.
b. Blanket Insulation - Blanket insulation shall conform to ASTM C 991.
c. Glass Mat Gypsum Roof Board - Glass mat gypsum roof board for use above the deck or insulation for thermal protection shall have a flame spread - 0, smoke developed - 0, shall be water resistant and have a compressive strength of 500 psi. Glass mat gypsum roof board shall conform to ASTM C 1177/C 1177M.

B301001 1.5.11 Sealant

Sealants shall be elastomeric type containing no oil or asphalt. Exposed sealant shall be colored to match the applicable building color or clear and shall cure to a rubber like consistency. Sealant placed in the roof panel standing seam ribs shall be provided in accordance with the manufacturer's recommendations.

B301001 1.5.12 Vapor Retarder

a. Vapor Retarders as Integral Facing - Alloy conforming to ASTM B 209, temper as required for the forming operation, minimum 0.032 inch thick. Insulation facing shall have a permeability of 0.02 perm or less when tested in accordance with ASTM E 96.
b. Vapor Retarders Separate from Insulation - Vapor retarder material shall be polyethylene sheeting conforming to ASTM D 4397. A single ply of 10 mil polyethylene sheet; or, at the Contractor's option, a double ply of 6 mil polyethylene sheet shall be used. A fully compatible polyethylene tape with equal or better water vapor control characteristics than the vapor retarder material shall be provided. A cloth industrial duct tape in a utility grade shall also be provided to use as needed to protect the vapor retarder from puncturing.
c. Slip Sheet for Use With Vapor Retarder - Slip sheet for use with vapor retarder shall be a 5 lb. per 100 square feet rosin-sized, unsaturated building paper.

B301001 1.5.13 EPDM Rubber Boots

Flashing devices around pipe penetrations shall be flexible, one-piece devices molded from weather-resistant EPDM rubber. Rubber boot material shall be as recommended by the manufacturer. The boots shall have base rings made of aluminum or corrosion resisting steel that conform to the contours of the roof panel to form a weather-tight seal.

B301001 1.5.14 Prefabricated Curbs and Equipment Support

Prefabricated curbs and equipment supports shall be of structural quality, hot-dipped galvanized or galvanized sheet steel, factory primed and prepared for painting with mitered and welded joints. Integral base plates and water diverter crickets shall be provided. Minimum height of curb shall be 8 inches above finish roof. Curbs shall be constructed to match roof slope and to provide a level top surface for mounting of equipment. Curb flange shall be constructed to match configuration of roof panels. Curb size shall be coordinated, prior to curb fabrication, with the mechanical equipment to be supported. Strength requirements for equipment supports shall be coordinated to include all anticipated loads. Flashings shall not be rigidly attached to underline structure.

B301002 LOW SLOPE ROOF SYSTEMS

B301002 1.1 GENERAL REQUIREMENTS

a. Warranty (Except SSMRS) - Furnish the roofing system manufacturer's materials and workmanship warranty for the roofing system. The warranty period shall not be less than 20 years from the date the Government acceptance of the work. The warranty shall be issued directly to the Government and shall not be limited in dollar value. The system warranty shall include roofing membrane, insulation, flashings, accessories and attachments.
b. Wind Uplift - The complete roof covering assembly shall be rated in accordance with FM P7825, capable of withstanding an uplift pressure as determined by ASCE-7, and FM I-49 for perimeter and flashing attachment.
c. Fire Safety - The complete roof covering assembly shall meet ASTM E 108, Class 1A or UL 790, Class A; and be listed as Fire-Classified roof deck construction in the UL RMSD, or Class I roof deck construction in FM P7825. All components of the system shall be UL labeled. Complete roof covering assembly shall:1) Be Class A or B rated in accordance with ASTM E 108 , FM 4470, or UL 790; and2) Be listed as part of Fire-Classified roof deck construction in UL RMSD, or Class I roof deck construction in FM P7825c.
d. Traffic Pads - Provide on roof system to protect roof from foot traffic. Provide traffic pads from roof access to and around roof mounted mechanical equipment and underneath removable mechanical equipment access panels. Traffic pads shall be of compatible material to roof.
e. Cool Roof - If required in RFP Part 2 or Part 3 comply with UFC 3-110-03, Roofing Chapter 1, Cool Roofs. Cool roof design must follow the requirements in UFC 3-110-03 "Roofing" Chapter 1, Cool Roofs.

B301002 1.2 BUILT-UP ASPHALT ROOFING (AGGREGATE SURFACED)

This paragraph covers the requirements for aggregate surfaced bituminous built-up roofing made up of glass felt, asphalt bitumen, and aggregate surfaced or modified bitumen cap sheet.

B301002 1.2.1 Materials

a. Asphalt - ASTM D 312, Type II, III or IV

b. Felts - Base Sheet (GB) – ASTM D 4601, Type II without perforations

1) Ply Felt (GA) – ASTM D 2178, Type IV or VI

2) Ventilating Base Sheet VB) – ASTM D 4897

3) Flashing Felt (SBS Modified Base Sheet - MB) per ASTM D 6162 (with combined polyester and glass fiber reinforcing), Type II, Grade G (weighing 4.3(90 lbs./100sf), and a thickness of 130 mils) or Grade S (weighing 58 lbs./100sf and a thickness of 85 mils), ASTM D 6163 (with glass fiber reinforcing), Type II, Grade G (weighing 90 lbs./100sf, and a thickness of 130 mils) or S (weighing 58 lbs./100sf and a thickness of 85 mils), ASTM D 6164 (with polyester reinforcing), Type II, Grade G (weighing 90 lbs./100sf, and a thickness of 130 mils) or S (weighing 70 lbs./100sf and a thickness of 115 mils).

4) SBS Bitumen Cap Sheet (RSS) – ASTM D 6162 (with combined polyester and glass fiber reinforcing), Type II, Grade G (weighing 90 lbs./100sf, and a thickness of 130 mils), ASTM D 6163 (with glass fiber reinforcing), Type II, Grade G (weighing 90 lbs./100sf, and a thickness of 130 mils), ASTM D 6164 (with polyester reinforcing),

c. Primer - ASTM D 41

d. Asphalt Roof Cement - ASTM D 4586, Type II for vertical surfaces and Type I for horizontal surfaces.

e. Aggregate for Surfacing Built-up Roofing - ASTM D 1863

f. Fasteners - Provide metal fasteners of copper, aluminum or stainless steel, compatible with materials to be penetrated. Fasteners shall be of sufficient length to achieve appropriate embedment or penetration into the substrate below.

g. Metal Discs - Flat discs or caps of zinc-coated steel not less than 28 gage and not less than 1-3/8 inches (35 mm) in diameter.

h. Traffic Pads - Preformed reprocessed rubber, compatible with the roof membrane, 1/4-inch (6.35 mm) minimum thickness, weighing not less than 1-1/2 pounds per square foot, to protect roof from foot traffic. Provide traffic pads around roof access and around roof mounted equipment and underneath removable mechanical equipment access panels.

B301002 1.2.2 FIELD QUALITY CONTROL

a. Tests for Surface Dryness - see paragraph B301002 1.2 for Performance Verification and Acceptance Testing requirements.

B301002 1.3 ETHYLENE PROPYLENE DIENE MONOMER (EPDM)

B301002 1.3.1 Materials

a. EPDM Sheet - ASTM D 4637. Ethylene Propylene Diene Monomer (EPDM), reinforced, 60 mil (1.52 mm) thick for fully adhered application. Seams shall be sealed with seam tape versus liquid adhesive, unless previously approved by DOR.

b. Flashing and Flashing Accessories - Flashing, including perimeter flashing, flashing around roof penetrations, and

prefabricated pipe seals, shall be 0.06 inch (1.5 mm) minimum thick uncured EPDM sheet or 0.045 inch (1.1 mm) minimum thick cured EPDM.

c. Fasteners - Provide fasteners warranted by the roofing manufacturer for the EPDM sheet installation.

d. Roof Insulation - Provide rigid board insulation beneath the EPDM sheet as part of the warranted roof system, and compatible with the adhesive used in the installation.

B301002 1.4 MODIFIED BITUMINOUS MEMBRANE ROOFING

This paragraph covers the requirements for modified bituminous membrane sheet roofing, SBS modified for hot mopping or cold applied, with a minimum slope of 1/2 inch per foot. Contractor shall provide a complete modified bitumen roofing system, to include insulation, flashings, felts, primers and adhesives as recommended for the installation either on a nailable (plywood or metal deck) or non-nailable (concrete) substrate, from the materials below. All work must follow the NRCA RoofMan guidelines and standards stated within this Section.

B301002 1.4.1 Materials

a. Asphalt - ASTM D 312, Type III or IV.

b. Ply Materials -

1) Ventilating Base Sheet (VB) – ASTM D 4897, Type II

2) Base Sheet (GB) – ASTM D 4601, ASTM D 1668, Type II without perforations

3) SBS Modified Base Sheet (MB) – ASTM D 6162 (with combined polyester and glass fiber reinforcing), Type II, Grade S weighing 58 lbs./100sf and a minimum thickness of 85 mils), ASTM D 6163 with glass fiber reinforcing), Type II, Grade S (weighing 58 lbs./100sf and a minimum thickness of 85 mils), ASTM D 6164 (with polyester reinforcing), Type II, Grade S (weighing 70 lbs./100sf and a minimum thickness of 115 mils).

4) SBS Interply Sheet: ASTM D 6162, ASTM D 6164, ASTM D 6163, Type I or II, Grade S, minimum 80 mils (2.0 mm) thick.

5) SBS Bitumen Cap Sheet (RSS) – ASTM D 6162 (with combined polyester and glass fiber reinforcing), Type II, Grade G (weighing 90 lbs./100sf, and a minimum thickness of 145 mils), ASTM D 6163 (with glass fiber reinforcing), Type II, Grade G (weighing 90 lbs./100sf, and a minimum thickness of 145 mils), ASTM D 6164 (with polyester reinforcing), Type II, Grade G (weighing 90 lbs./100sf, and a minimum thickness of 145 mils). Provide polyester reinforced cap sheet on roofs expected to experience high levels of traffic, on roofs with congested equipment, where equipment is expected to receive regular service or high maintenance, and where other service conditions warrant.

c. Mineral Roofing Granules - Factory applied, requiring no further coating.

d. Primer - ASTM D 41

e. Asphalt Roof Cement - ASTM D 4586, Type II for vertical surfaces,

Type I for horizontal surfaces.

f. Fasteners - Provide non-corrosive fasteners meeting the requirements of FM A/S4470.
g. Asphalt Adhesive - ASTM D 4479, Type III.
h. Reflective Coating - 100% Acrylic Elastomeric with Energy Star Rating exceeding the requirements of ASTM D-6083. Coating shall be intended for use as a roof topcoat.

B301002 1.5 STRUCTURAL STANDING SEAM METAL ROOFING

See B301001 1.5.1 "Structural Standing Seam Metal Roof System" for SSSMR requirements.

B301003 ROOF INSULATION & FILL

The insulation system shall be coordinated with the mechanical design to suit the energy requirements of the facility.

B301003 1.1 MINERAL FIBER BLANKET INSULATION

This paragraph covers the requirements for mineral fiber blanket thermal insulation in attics and above ceilings.

B301003 1.1.1 Products

a. Blanket Insulation - ASTM C 665, Type I, II, or III, as appropriate for the installation, Class A, membrane-faced surface with a flame spread of 25 or less; and a smoke developed rating of 150 or less when tested in accordance with ASTM E 84. Indicate insulation R-values on the design drawings.
b. Blocking – Treated wood, metal, un-faced mineral fiber blankets in accordance with ASTM C665, Type I. Blocking around chimneys and other heat producing devices shall be non-combustible and shall meet the requirements of ASTM E 136.
c. Vapor Retarder - 6 mil (minimum) thick polyethylene sheeting conforming to ASTM D 4397, with a water permeance value of 1 perm or less when tested according with ASTM E 96.

B301003 1.2 ROOF AND DECK INSULATION

This paragraph covers the requirements for insulation materials used below the roofing systems.

B301003 1.2.1 Insulation Types

Roof insulation shall have an R-value determined per ASHRAE Standard 90.1 and per project energy goals and be one or an assembly of a maximum of three of the following materials and compatible with attachment methods for the specified insulation and roof system:

a. Expanded Perlite Board – ASTM C 728, minimum thickness of 3/4" boards, and 4' by 4' board size.
b. Polyisocyanurate Board – ASTM C 1289, with a minimum compressive strength of 138 kPa (20 psi), unless overlaid with another board with a comparable or greater compressive strength. Use

insulation facer as recommended by the roofing material manufacturer. Board size shall be restricted to 4' by 4' when applied in direct contact with concrete deck.

c. Composite Boards – ASTM C 984 (Polyisocyanurate-perlite) or ASTM C 1050 (Polystyrene-wood fiberboard), Type III, Grade 1, Class A, or ASTM C 1289, Type V, oriented strand board or waferboard on one side and fibrous felt or glass fiber mat membrane or aluminum foil on the other.

d. Wood Fiber (high density) – ASTM C 208

B301003 1.2.2 Tapered Roof Insulation

On portions of the roof where the sloping of structure does not allow the minimum slopes, provide a factory tapered roof insulation system to provide positive drainage of roof system, and to include drainage around curbs, penetrations, and projections through the roof plane. For new construction, provide one layer of the tapered roof insulation assembly factory tapered to a slope not less than 1/2" per foot (13 mm per 300 mm). For re-roofing applications where slopes of 1/2" per foot (13 mm per 300 mm) cannot be achieved, provide a minimum of 1/4" per foot (6.35 mm per 300 mm) slope.

B301003 1.2.3 Protection Board

Provide for use as a thermal barrier (underlayment) or protection board for hot-mopped applications.

B301003 1.2.4 Glass Mat Gypsum Roof Board

ASTM C 1177, with a 0 Flame Spread and 0 Smoke Developed when tested in accordance with ASTM E 84.

B301003 1.2.5 Bitumens

a. Asphalt Primer - ASTM D 41

b. Asphalt - ASTM D 312, Type III or IV

c. Asphalt Roof Cement - ASTM D 4586, Type I for horizontal surfaces, Type II for vertical and sloped surfaces. Roof cement shall be compatible with membrane materials.

B301003 1.2.6 Underlayment

a. Asphalt-Saturated Felt Base Sheet for Single Layer Application - ASTM D 4869, Type II or ASTM D 226, Type II (30 pounds).

b. Polymer-Modified Self-Adhering Bitumen Sheet, 40 mil (1.1 mm) minimum thickness. Provide at roof perimeter, valley and roof penetration locations as a minimum.

B301003 1.2.7 Seal at Penetrations

Provide pre-manufactured flashing components for use in single-ply roofing applications. Seal laps and penetrations to prevent moisture vapor penetration. Adhesives, sealants, prefabricated components and spray foam products may be required.

B301003 1.2.8 Fasteners

Fasteners shall be flat, round or hexagonal steel (not less than 1-3/8"(35 mm) diameter) and 28 gage, or plastic plates (not less than 3 inches (75 mm) in diameter).

Fasteners in lightweight cellular concrete decks shall penetrate at least 1 inch (25 mm) but not more than 1-1/2 inches (32 mm) into the deck. Withdrawal resistance from lightweight cellular concrete deck shall be not less than 40 lbs.(18 kg) each, or 120 lbs. (54 kg) each in metal deck.

Fasteners in steel decks shall be hardened fasteners or screws conforming to FM A/S4470 and listed in FM P7825 for Class I roof deck construction.

Fasteners shall be place to withstand an uplift pressure required by the project program in the field of the roof and FM LPDS 1-49 for perimeter component and flashing attachment.

Roofing Nails - Provide corrosion resistant ring shank nails of sufficient length to penetrate a minimum of 1 inch (25 mm) into wood nailers or so as to provide appropriate embedment in substrate below. Fasteners shall conform to FM A/S4470, and be placed to withstand an uplift pressure of 90 psf (4.3 kPa) conforming to FM P7825, and FM 1-49 for perimeter fasteners.

B301003 1.2.9 Wood Nailers

Wood nailers shall be pressure-preservative-treated in accordance with AWPA M2 Standards, permanently marked or branded, and installed flush with the top of the adjacent insulation board. Separate treated wood nailers from roofing metals with underlayment.

B301003 1.2.9.1 Fasteners

Provide stainless steel, double hot-dipped galvanized or other corrosion resistant fasteners recommended by the treatment manufacturer for use with treated wood.

B301004 FLASHINGS & TRIM

B301004 1.1 FLASHING AND SHEET METAL

This paragraph covers the requirements for flashing and sheet metal work including scuppers, splash pans, and sheet metal roofing. Flashing and sheet metal shall be provided in accordance with roof manufacturer’s printed installation instructions and in compliance with NRCA and SMACNA recommendations.

B301004 1.1.1 Materials

Furnish sheet metal items in minimum 8 to 10 foot (2.44 to 3.05 meter) lengths. Sheet metal items include the following: gutters, including hangers; downspouts; counter-flashings; gravel stops and fascias; cap, valley, stepped, base and eave flashings and related accessories.

a. Copper, Sheet and Strip - ASTM B 370, cold-rolled temper.
b. Lead-Coated Copper Sheet - ASTM B 101
c. Lead Sheet - Minimum weight 4 pounds per square foot (.19 kPa).
d. Steel Sheet, Zinc-Coated (Galvanized) - ASTM A 653/ A 653M. Galvanized steel items shall have a baked-on, factory applied finish of polyvinylidene fluoride or an equivalent fluorocarbon coating with a minimum thickness of 0.8 to 1.3 mils.
e. Stainless Steel - ASTM A 167, Type 302 or 304, 2D finish, fully annealed, dead-soft temper.
f. Aluminum Alloy Sheet and Plate - ASTM B 209
g. Pre-Finished Aluminum - Provide trim, gravel stops and fascias of Pre-finished aluminum. Finish shall be baked-on factory applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating with a minimum thickness of 0.8 to 1.3 mils.
h. Aluminum alloy, Extruded Bars, Rods, Shapes, and Tubes - ASTM B 221
i. Solder - ASTM B 32
j. Polyvinyl Chloride Reglet - ASTM D 1784, Type II
k. Asphalt Primer - ASTM D 41
l. Fasteners - Fasteners shall be of the same or compatible metal with the item being fastened. Stainless steel fasteners shall be used to fasten dissimilar materials.

B301004 1.1.2 Field Quality Control

Fabrication and installation of sheet metal items shall be as follows:

a. Install work with watertight and hairline joints, without waves, warps, buckles, fastening stresses, or distortion, allowing for expansion and contraction.
b. Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry and free of defects and projections that could affect the application.
c. Provide sheet metal flashing in angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and necessary to make the work watertight.
d. Provide prefabricated inside and outside corners at all sheet metal intersection pieces. Minimum leg length shall be 12 inches (300 mm), maximum length shall be 18 inches (450 mm).
e. Sheet metal shall be fabricated to conform to the contours of surfaces to which applied.
f. All sheet metal cap flashings shall have waterproof membrane underlayment installed behind or below the metal components.
g. Provide conforming sheet metal closures at all flashing termination conditions.
h. Provide fastenings and accessories as required to provide a securely attached, watertight construction. Cleats shall be a minimum of one gage heavier than the component to be attached.
i. Where sheet metal components are to be embedded in the roofing system, prime both sides of all metal flanges prior to installation.

B301005 GUTTERS AND DOWNSPOUTS

Provide gutters and downspouts compatible with roofing material and finish. Concealed (interior) gutters and downspouts are prohibited. The primary and secondary drainage systems shall be sized per applicable Plumbing and Building Codes. Finish shall be baked-on factory applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating with a minimum thickness of 0.8 to 1.3 mils.

B301006 ROOF OPENINGS AND SUPPORTS

B301006 1.1 GENERAL REQUIREMENTS

Provide flashings for roof openings and supports as recommended by the NRCA and as specified below:

When existing pitch pans cannot be avoided and must be utilized, insure pitch pan is a preformed pan with minimum 4-inch (100 mm) height and 2-inch (50 mm) flange with 2-inch (50 mm) clearance on all sides of the penetration. Fill bottom 1/3 with non-shrink grout. Fill remainder with pourable elastomeric sealer sloped to drain. For round penetrations, provide a metal umbrella cap clamped to the penetration.

Assure all penetration flashings extend minimum 8 inches (200 mm) above the finished roof surface. Use round shapes to construct equipment supports. Equipment supports should be raised on a continuous curb a minimum of 14 inches (350 mm), but not less than as required by the NRCA.

B301006 1.2 ROOF HATCHES

Construct using NRCA approved techniques and details. Provide roof hatch where required by OSHA, or as access to roof when roof mounted equipment is used or other routine roof maintenance is required.

B301006 1.2.1 Construction

Provide insulated roof hatches of 14 gage galvanized steel with 22 gage galvanized steel liner or 18 gage aluminum liner, and have integral curb, flange and flashings for securing to roof deck. Hinge shall be heavy-duty zinc plated steel with non-removable pins. Latching mechanism shall be zinc-coated steel slam latch with inside and outside levers. Springs shall be greased compression springs in telescopic tubes. Provide interior locking of roof hatch. Provide a safety rail or ladder extension. Size roof hatch to allow access of routine maintenance equipment, but not less than 2'-6" x 3'-0" (750 mm x 900 mm). Hatch and access ladders shall conform to OSHA and other applicable safety standards.

B301006 1.3 GLAZED ROOF OPENINGS

This paragraph covers the requirements for skylights manufactured from glass-fiber or thermoplastic carbonate.

Skylights and other glazed roof openings shall be used only to supplement interior lighting levels (generally in steep slope or vertical applications), and otherwise, are discouraged from use. Proper detailing is critical, and shall be scrutinized closely to minimize the likelihood of future leaks at these locations.

B301006 1.3.1 Warranty

The contractor shall furnish to the Government the manufacturer's complete warranty for materials, workmanship and installation. The warranty is for 10 years from the time of project completion. The warranty shall guarantee, but shall not be limited to, the following:

a. Light transmission and color of the panels shall not change after exposure to heat of 300 degrees F (149 degrees C) for 25 minutes.
b. There is no delamination of the panel affecting appearance, performance, weatherability or structural integrity of the panels or the completed system.
c. There is no fiberbloom on the panel face.
d. Change in light transmission of no more than 6% per ASTM D 1003, and in color (yellowing index) no more than 10 points in comparison to the original specified value over a 10 year period.

B301006 1.3.2 Skylight Panels

Skylight panels shall be constructed of glass-fiber reinforced polyester or extruded cellular thermoplastic polycarbonate materials. Glass-fiber reinforced panels shall conform to ASTM D 3841 and to the requirements of AAMA 1600/I.S.7.

a. Non-Combustible Grid Core - The aluminum I-beams shall be 6063-T6 with provisions for mechanical interlocking of muntin-mullion and perimeter to provide full bonding surface to contact the face material. Panels shall withstand 1200 degrees F (650 degrees C) for a minimum of one hour without collapse or exterior flaming.
b. Adhesive - The laminate adhesive shall meet the following requirements:1) Tensile strength of 750 psi-in. in accordance with ASTM C 297.2) Shear strength shall meet or exceed the following per ASTM D 1002:a) 540 psi (3723 kPa) at 50% relative humidity and 73 degrees F (23 degrees C).b) 800 psi (5516 kPa) under accelerated aging per ASTM D 1037 at room temperature.c) 250 psi (1724 kPa) under accelerated aging per ASTM D 1037 at 182 degrees F (83 degrees C).d) 1400 psi (9653 kPa) after 500 hour Oxygen Bomb per ASTM D 572.e) 100 psi (690 kPa) at 182 degrees F (83 degrees C).
c. Panel Construction - Panels shall consist of fiberglass faces laminated to an aluminum I-beam grid core and shall not deflect more than 1.9 inches (48 mm) at 30 psf (1.44 kPa) in 10 feet (3.048 meters) per ASTM E 72, without a supporting frame.

B301006 1.3.3 Thermoplastic Polycarbonate Panels

The glazing panels shall meet the following requirements:

a. The interior flame spread classification shall be Class I in accordance with ASTM E 84, with a smoke developed rating no greater than 70 in accordance with ASTM D 2843.
b. The exterior and interior faces shall be an approved light

transmitting panel with a CC1 fire rating classification in accordance with ASTM D 635.

c. Self-ignition shall be greater than 1058 degrees F (570 degrees C) in accordance with ASTM D 1929.

d. Fire rated roof assembly translucent panels shall be successfully evaluated for fire from exterior exposure per ASTM E 108 to meet Class 'A' rating, and be listed by an independent recognized listing laboratory.

B301006 1.4 GUARDS

Provide rails or guards as required by the OSHA, the International Building Code or other applicable safety standards.

B301090 OTHER ROOFING

B301090 1.1 LIGHTNING PROTECTION

Lightning protection component penetrations and attachments shall be sealed and flashed and anchored in a permanent manner and in a manner to avoid the degradation of the watertight integrity of the roof system. Do not cut or otherwise disturb the roof membrane. Mastic seals in the plane of the roof are unacceptable. Anchor plates set in mastic shall be set on roof surface cleaned of aggregate and loose material prior to mastic application.

B301090 1.2 ROOF DRAINS (EXISTING)

Where existing roof drains are to be reused in roof replacement construction, the contractor shall provide new, compatible flashing materials, a new drain clamping ring and new bolts for anchorage. Reuse of existing clamping ring and bolts is unacceptable.

B301090 1.3 VEGETATED ROOFS

Where vegetated roofs are specified, provide additional technical specification for Government approval. Refer to UFC 3-110-03 and Whole Building Design Guide section titled "Vegetated Roof Covering ".

-- End of Section --

FORMS

ROOFING SYSTEM COMPONENTS

1. Contract Number: _____

2. Building Number and Location: _____

3. NAVFAC Specification Number: _____

4. Deck Type: _____

5. Slope of Deck: _____

6. Insulation Type and Thickness:_____

7. Insulation Manufacturer: _____

8. Vapor Retarder (_____) Yes (_____) No

9. Vapor Retarder Type: _____

10. Roofing Description: _____

    Manufacturer (Name, address, and phone no.): _____

    _____

    Type: _____

    Method of attachment: _____

11. Statement of Compliance or Exception: _____

    _____

    _____

12. Date Roof Completed: _____

13. Warranty Period: _____

14. Roofing Contractor (Name and Address):

    _____

    _____

    _____

15. Prime Contractor (Name and Address):

    _____

_____

_____

Contractor's Signature _____ Date: _____

Inspector's Signature _____ Date: _____

Form page 1

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY FOR STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM

FACILITY DESCRIPTION_____

BUILDING NUMBER:_____

CONTRACT NUMBER:_____

CONTRACTOR

CONTRACTOR:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

OWNER

OWNER:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONSTRUCTION AGENT

CONSTRUCTION AGENT:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

Warranty page 1

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY FOR STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM (continued)

THE SSSMR SYSTEM INSTALLED ON THE ABOVE NAMED BUILDING IS WARRANTED BY _____ FOR A PERIOD OF FIVE (5) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE. THE SSSMR SYSTEM COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: THE ENTIRE ROOFING SYSTEM, MANUFACTURER SUPPLIED FRAMING AND STRUCTURAL MEMBERS, METAL ROOF PANELS, FASTENERS, CONNECTORS, ROOF SECUREMENT COMPONENTS, AND ASSEMBLIES TESTED AND APPROVED IN ACCORDANCE WITH ASTM E 1592. IN ADDITION, THE SYSTEM PANEL FINISHES, SLIP SHEET, INSULATION, VAPOR RETARDER, ALL ACCESSORIES, COMPONENTS, AND TRIM AND ALL CONNECTIONS ARE INCLUDED. THIS INCLUDES ROOF PENETRATION ITEMS SUCH AS VENTS, CURBS, SKYLIGHTS; INTERIOR OR EXTERIOR GUTTERS AND DOWNSPOUTS; EAVES, RIDGE, HIP, VALLEY, RAKE, GABLE, WALL, OR OTHER ROOF SYSTEM FLASHINGS INSTALLED AND ANY OTHER COMPONENTS SPECIFIED WITHIN THIS CONTRACT TO PROVIDE A WEATHERTIGHT ROOF SYSTEM; AND ITEMS SPECIFIED IN OTHER SECTIONS OF THE SPECIFICATIONS THAT ARE PART OF THE SSSMR SYSTEM.

ALL MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE ASSOCIATED WITH THE SSSMR SYSTEM COVERED UNDER THIS WARRANTY SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REPAIR OR REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON _____ AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE.

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

_____

(Company President) (Date)

Warranty page 2

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY FOR STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM (continued)

THE CONTRACTOR SHALL SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE MANUFACTURER AND INSTALLER OF THE SSSMR SYSTEM, WHICH SHALL BE SUBMITTED ALONG WITH THE CONTRACTOR'S WARRANTY. HOWEVER, THE CONTRACTOR WILL BE ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINED IN THE SPECIFICATIONS AND AS INDICATED IN THIS WARRANTY EXAMPLE.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).

2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.

3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF THE BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.

4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDRIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.

5. FAILURE OF ANY PART OF THE SSSMR SYSTEM DUE TO ACTIONS BY THE OWNER TO INHIBIT FREE DRAINAGE OF WATER FROM THE ROOF AND GUTTERS AND DOWNSPOUTS OR ALLOW PONDING WATER TO COLLECT ON THE ROOF SURFACE. CONTRACTOR'S DESIGN SHALL INSURE FREE DRAINAGE FROM THE ROOF AND NOT ALLOW PONDING WATER.

6. THIS WARRANTY APPLIES TO THE SSSMR SYSTEM. IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THE BUILDING INTERIOR OR CONTENTS THAT IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.

7. THIS WARRANTY CANNOT BE TRANSFERRED TO ANOTHER OWNER WITHOUT WRITTEN CONSENT OF THE CONTRACTOR; AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUTES.

**

Warranty page 3

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY FOR STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM (continued)

**REPORTS OF LEAKS AND SSSMR SYSTEM DEFICIENCIES SHALL BE RESPONDED TO WITHIN 48 HOURS OF RECEIPT OF NOTICE, BY TELEPHONE OR IN WRITING, FROM EITHER THE OWNER OR CONTRACTING OFFICER. EMERGENCY REPAIRS TO PREVENT FURTHER ROOF LEAKS SHALL BE INITIATED IMMEDIATELY; A WRITTEN PLAN SHALL BE SUBMITTED FOR APPROVAL TO REPAIR OR REPLACE THIS SSSMR SYSTEM WITHIN SEVEN (7) CALENDAR DAYS. ACTUAL WORK FOR PERMANENT REPAIRS OR REPLACEMENT SHALL BE STARTED WITHIN 30 DAYS AFTER RECEIPT OF NOTICE, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE CONTRACTOR FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE SSSMR SYSTEM REPAIRED OR REPLACED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR.

IN THE EVENT THE CONTRACTOR DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, THE CONTRACTOR MAY CHALLENGE THE OWNER'S DEMAND FOR REPAIRS OR REPLACEMENT DIRECTED BY THE OWNER OR CONTRACTING OFFICER EITHER BY REQUESTING A CONTRACTING OFFICER'S DECISION UNDER THE CONTRACT DISPUTES ACT, OR BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED, THE PARTIES SHALL, WITHIN TEN (10) DAYS, JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES SHALL CONFER WITHIN TEN (10) DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND THE PRESIDENT OF THE CONTRACTOR'S COMPANY WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE (1) NAME REMAINS. THE REMAINING PERSON SHALL BE THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED, ETC., SHALL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT SHALL PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION WILL BE REQUESTED NOT LATER THAN 30 DAYS FOLLOWING THE HEARING. THE DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT.

A FRAMED COPY OF THIS WARRANTY SHALL BE POSTED IN THE MECHANICAL ROOM OR OTHER APPROVED LOCATION DURING THE ENTIRE WARRANTY PERIOD.

Warranty page 4

SECTION C10

INTERIOR CONSTRUCTION
09/15

C10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

C10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards that are referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

C10 1.1.1 Industry Standards and Codes

Sealant, Waterproofing & Restoration Institute

C10 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, ArchitectureUFC 3-120-10, Interior Design)
UFC 1-200-02	High Performance and Sustainable Buildings

C10 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory interior construction assemblies' performance shall be via Performance Verification Testing, as detailed in this section

of the RFP. Provide special tests and special inspections in accordance with UFGS Section 01 45 00.05 20, *Design and Construction Quality Control*. The Contractor shall pay the cost of all testing.

C10 1.2.1 Slump and Compressive Strength Tests for Grout

Slump between 8 and 11 inches (200 and 275 mm). Provide minimum grout strength of 2000 PSI in 28 days, as tested per ASTM C 1019.

C10 1.2.2 Door Closure Field Test for Demountable Partitions, Retractable Partitions, Operable Panels, and Accordion Partitions

Perform a flashlight test of all joints in partitions and partition to wall, floor, and ceiling. No light from a flashlight shall be visible from the opposite side of the partition. Adjust partition at locations where light is visible, and re-test.

C10 1.2.3 Field Test for Sprayed Fire-Resistive Materials

A qualified testing and inspection agency shall be engaged to prepare testing and adhesion reports to test for bond strength. Bond strength shall be tested per ASTM E 736 and be found to meet the requirements in UL's *Fire Resistance Directory*for coating materials.

C10 1.3 DESIGN SUBMITTALS

Design submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-101-01, *Architecture*, and UFC 3-301-01, *Structural Engineering*.

C10 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following submittals as a minimum:

Doors, door hardware, windows and glazing, cabinets and countertops, casework, and fireproofing/firestopping.

All structural elements necessary for construction

C10 1.5 SUSTAINABILITY

Provide products and systems in accordance with UFGS 01 33 29.05 20 Sustainability Reporting for Design Build.

C1010 PARTITIONS

For general use, metal studs and standard grade GWB, CMU with prime filler coat, or CMU/cast-in-place concrete with GWB or skim coat plaster are acceptable unless shown otherwise in the Project Program. Reinforce points where doorknobs can strike a wall and anchorage points for wall mounted equipment.

Provide control joints and installation techniques as recommended by the

manufacturer. See PTS Section C30, *Interior Finishes*, for additional information.

Provide painted GWB with access panels at surfaces furred for HVAC, plumbing and other utility services and controls behind wall surfaces.

Acceptable systems where "IMPACT RESISTANCE" (areas subject to physical abuse or wear) is designated in the project program requirements for impact resistance systems include:

a. CMU/cast-in-place concrete with or without plaster or furred impact resistant GWB or surface applied impact resistant textured acrylic architectural coating system.
b. GWB/metal stud system reinforced for impact resistance with a double layer of gypsum board using at least one layer of impact resistant gypsum board to resist denting and puncturing on the impact surface. If wall is subjected to impact on both sides, both sides of the stud require a double layer of gypsum board. Structural, mechanical, and acoustical design requirements effect the metal stud/gypsum support configuration.

C101001 FIXED PARTITIONS

Provide fixed partitions, except where demountable or retractable partitions are specifically required by the "Room Requirements", to include wood or metal studs, GWB, plaster, masonry and cast-in-place concrete walls. Sound-rated partition assemblies shall have a minimum Sound Transmission Coefficient (STC) as required by the project program. Construct sound-rated bulkheads above partition assemblies for continuity to the deck above.

C101001 1.1 CAST-IN-PLACE INTERIOR CONCRETE WALLS

Accomplish work in accordance with UFC 1-200-01, ACI 117 and 301/301M. Concrete Mix Design shall be suitable for the job conditions.

C101001 1.2 MASONRY PARTITIONS

Accomplish work in accordance with ACI 530.1/ASCE 6/TMS 602 and associated ASTM Standards for concrete masonry wall construction.

C101001 1.2.1 Testing

Masonry strength shall be determined in accordance with ACI 530.1. Where fire-rated assemblies are indicated, provide concrete masonry units that have been tested in conformance with ASTM E 119. Provide certificate of compliance to the Designer of Record (DOR) that the materials and assemblies meet the fire ratings indicated on the drawings.

C101001 1.2.2 Masonry Units Types

C101001 1.2.2.1 Concrete Masonry Units

Units of modular dimensions and air, water or steam cured. Surfaces of units to be plastered or stuccoed shall be sufficiently rough to provide bond and exposed surfaces of units

shall be smooth and of uniform texture.

a. Hollow Load-Bearing Units: ASTM C 90, Type I or II, made of lightweight or normal weight aggregate.
b. Hollow Non-Load-Bearing Units: ASTM C 129, Type I or II, made with lightweight or normal weight aggregate.
c. Special Shapes: Provide special shapes as necessary to complete the work.
d. Fire-Rated CMU: Products shall be tested and approved by United Laboratories (UL) according to testing methods described in ASTM E 119, and listed as 2, 3 or 4-hour fire-rated.

C101001 1.2.2.2 Glazed Structural Clay Tile

Provide glazed tile of Grade S, Type I, conforming to ASTM C 126. Tile for fire-rated walls shall have the percent of solid required for that rating.

C101001 1.2.2.3 Pre-Faced Concrete Masonry Units

Provide pre-faced concrete masonry units conforming to ASTM C 744, load-bearing or non-load-bearing, lightweight, Grade N, Type I.

C101001 1.2.2.4 Glass Masonry Units

Provide glass block units made of clear colorless glass with polyvinyl butyl edge coating. Provide all aggregates, horizontal and vertical joint reinforcing, panel anchors, and expansion strip as recommended by the glass block manufacturer.

C101001 1.2.3 Masonry Partition Materials

a. Mortar - Provide ASTM C 270, Type N or S for non-shear-wall interior masonry. For Glass Block use Type S, White Portland cement.
b. Portland Cement - ASTM C 150, Type I, II, or III.
c. Masonry Cement - ASTM C 91, Type N, S, or M.
d. Sand - ASTM C144.
e. Grout - ASTM C 476, Fine aggregate for grouting cells / spaces 3" (75 mm) or less, or coarse aggregate for grouting cells / spaces greater than 3" (75 mm). Slump between 8 and 11 inches (200 and 275 mm). Provide minimum grout strength of 2000 PSI in 28 days, as tested per ASTM C 1019.

C101001 1.2.4 Masonry Accessories

a. Horizontal Joint Reinforcement – Fabricate from cold drawn steel wire, ASTM A 82. Wire shall be hot-dipped galvanized after fabrication in accordance with ASTM A 153/ A 153M, Class B-2, 1.5 ounces of zinc per square foot (42.52 g / 0.0929 sq. meter).
b. Anchors and Wall Ties – Provide of stainless steel, ASTM A 167,

Type 304, or zinc-coated steel.

c. Reinforcing Bars – ASTM A 615 / A 615M.

C101001 1.3 COLD-FORMED METAL FRAMING

Cold-Formed Metal Framing shall be designed and constructed in accordance with the provisions of UFC 1-200-01 and the International Building Code.

C101001 1.3.1 Studs

Galvanized steel, ASTM A 653 / A 653M, SS Grade 50, G60

C101001 1.3.2 Framing Accessories

Fabricate steel-framing accessories of the same material and finish used for framing members, with minimum yield strength of 33,000 psi (230 Mpa). Accessories include, but are not limited to, the following: bracing, bridging, blocking, web stiffeners, end and foundation clips, gusset plates, stud kickers, knee braces, girts, joist hangers, reinforcing and backer plates.

Provide permanent metal-to-metal contact separation from stud to electrical conduits, plumbing pipes, and other internal wall system components, such as electrical wires.

C101001 1.4 METAL SUPPORT ASSEMBLIES

Provide steel materials for metal support systems with galvanized coating per ASTM A 653/ A 653M, G60; aluminum coating ASTM A 463/ A 463M, T1-25; or a 55% aluminum-zinc coating ASTM A 792.

C101001 1.4.1 Suspended and Furred Ceiling Systems, and Wall Furring

ASTM C 841(for lath); ASTM C 645 (for GWB).

C101001 1.4.2 Non-load-Bearing Wall Framing / Furring

ML/SFA MLF (for lath); ASTM C 645, but not thinner than 0.0179 inch (0.4547 mm) thickness. Provide 0.0329 inch (0.8357 mm) minimum thickness for supporting wall hung items such as cabinetwork, equipment and fixtures and for GWB.

C101001 1.5 ROUGH CARPENTRY

Unless otherwise noted, all rough carpentry shall be concealed from view. All framing and board lumber shall be graded and marked by a recognized association or independent inspection agency. Certification of grade is acceptable in lieu of grade markings. Framing lumber such as studs, plates, caps, bucks and nailers shall be of the minimum grade for the application in accordance with the grading rules for the local species of framing and board lumber.

C101001 1.5.1 Moisture Content

Air-dry or kiln dry lumber as follows:

a. Framing lumber and boards – 19% maximum
b. Timbers 5" and thicker – 25% maximum

C101001 1.5.2 Fire-retardant Treatment

Comply with AWPA C20 or AWPA C27.

C101001 1.5.3 Preservative Treated Lumber

Preservative treated lumber shall be in accordance with AWPA Standards.

C101001 1.5.4 Structural Lumber

Provide of species and grade as listed in AF&PA 101 that have the following minimum allowable unit stresses: 1050 Fb, 700 Fc with 1,200,000 E (for engineered uses) but not less than required by structural calculations.

C101001 1.5.5 Plywood, Structural

PS-1, PS-2.

a. Plywood (Concealed) - C-D grade, exposure 1 durability classification, span rating of 24/16 or greater.
b. Plywood Shear Walls - Structural I, C-C or C-D grade, and a minimum thickness of 1/2 inch (12.5 mm), but not less than required by structural calculations.

C101002 DEMOUNTABLE PARTITIONS

This paragraph covers unitized/component based demountable walls/partitions and associated work, including tracks and anchoring systems. Requirements and configurations shall be in accordance with the project requirements. Majority of the components and hardware shall be provided by a single manufacturer and on the manufacturer's current GSA pricelist.

C101002 1.1 PERFORMANCE REQUIREMENTS

C101002 1.1.1 Product Construction

Panels and framework shall be unitized/component based(not stick built), and non-progressive. All panel components including frames, glass frames, door frames, base trim, ceiling trim, and tracks shall be cold-formed steel or extruded aluminum and powder coated. Panels shall be a minimum of 2-1/4" thick, and shall have panels available between 6"-48" with 1/16" minimum with nominal widths and filler panels available. Panels shall have no more than a Â¼" reveal between adjacent panels or the use of connectors in the same finish of the skin. Panels shall have integrated leveling devices and have a minimum of Â½" adjustability at the ceiling and 1" of adjustability at the floor. Walls shall be capable of hanging any manufacturer's systems furniture. Walls must meet seismic requirements when applicable.

C101002 1.1.2 Surface Skin

Wall surfaces to be available including fabric, wood veneer, plastic laminate, painted MDF, glass, plexi-glass, resin, dry erase board, metal, and custom paint, with the option of being be segmented or monolithic. Surfaces all be interchangeable with the ability to apply a new skin/finish.

C101002 1.1.3 Door Assemblies

Doors shall be a minimum of 1-3/4" thick and available as a hinged or pivot door with the option of being a single or double doors, and with or without glass. All hardware to be included. Door and Frame assemblies shall be aligned and fitted, and securely anchored to partitions.

C101002 1.1.4 Glazing

Comply with the Federal Safety Standard for Architectural Glazing Materials and shall be factory installed. Options shall include clear, frosted, patterned, custom etched, back painted, and available for use on panels and doors.

C101002 1.1.5 Burning Characteristics and Fire Endurance

The system shall have a Class 'A' (under 25) flame spread rating in conformance with ASTM E 84.

Provide fabric and lining with a flame spread rating of 25 or less, fuel contribution rating of 15 or less, and a smoke generation of 50 or less when tested in accordance with ASTM E 84.

C101002 1.1.6 Acoustical Performance

Sound-rated partition assemblies shall have a minimum Sound Transmission Coefficient (STC) as required by the RFP Part 3, Project Program. STC ratings must be laboratory test and documentation must be provided.

C101002 1.1.7 Structural Performance

Panel deflection shall not exceed 1/120th of the vertical span when tested in accordance with ASTM E 72.

C101002 1.1.8 Electrical Requirements

Modular power options shall be available within solid wall cavities, base areas and frames and shall have open accessibility before, during and after installation. Power shall be accessible to power and data cabling, disconnection, and reconnection to accommodate wall disassembly and relocation. Power Supply to consist of an 8-wire system with 3,3,2 circuits and 2+1 grounding or a 10-wire system with 4-4-2 circuits and 2+2 grounding with isolated grounding available. UL Listed manufactured wiring system rated for 20amp 120V/208V or 120V/240V. The components shall have a permanent label listing manufacturer, catalog number, CSA/UL listing. Component's wiring

shall not be "de populated" to impede future configurations. Electrical system must be capable of working with other manufacturer's products. Light switch and outlet devices shall be provided by the mfr and be fully pre-wired and pre-installed at the factory. Cables shall have a J-Box option for hardwiring any manufacturer's furniture power feed cable. Receptacles to indicate which circuit within the modular wiring zone to which they are connected. Receptacles may/may-not be pre-dedicated but must be able to easily be switched to suit the user circuit requirements. Additional power and/or data modules & hardwired outlets (fire, safety, thermostats etc) shall have the option of being installed on any panel.

C101002 1.1.9 Installation

To include all materials, labor, equipment, and additional seismic bracing as necessary, needed for a turn-key installation. Existing Walls, ceilings, ceiling suspension systems, or floors shall not be altered or damaged to accomodate function of partitions. Manufacturer or manufacturer's representative must take field measurements prior to fabrication.

C101002 1.1.10 Field Test

Perform field tests as required in Paragraph C30 1.2 PERFORMANCE VERIFICATION AND FIELD TESTING.

C101002 1.2 WIRE MESH PARTITIONS

Wire mesh partitions shall be complete with all items necessary for a useable, and rigid installation. Provide pre-manufactured assemblies with pre-bolted connections. Wire mesh partition doors require a means of locking. Key and cylinder locks are required for partition doors used daily.

C101002 1.2.1 Materials

a. Steel shapes, plates and bars – ASTM A 36/ A 36M.
b. Cold-formed steel – AISI SG-673.
c. Wire mesh – Provide carbon steel wire with woven diamond mesh and intermediate crimping. Wire shall be 10 gauge mesh for seasonal storage, 6 gage mesh for protection of equipment and tools.

C101003 RETRACTABLE PARTITIONS

This paragraph covers all retractable partitions and associated work, including tracks and anchoring systems. Wall assemblies above retractable partitions shall provide a sound barrier equal to, or greater than, the sound rating of the partition.

C101003 1.1 PERFORMANCE REQUIREMENTS

The retractable partitions below shall meet the following performance requirements.

C101003 1.1.1 Burning Characteristics

The system shall have a Class 'A' (under 25) flame spread rating in conformance with ASTM E 84.

C101003 1.1.2 Fire Endurance

Provide fabric and lining with a flame spread rating of 25 or less, fuel contribution rating of 15 or less, and a smoke generation of 50 or less when tested in accordance with ASTM E 84.

C101003 1.1.3 Acoustical Performance

Sound-rated partition assemblies shall have a minimum Sound Transmission Coefficient (STC) as required by the project program. Construct sound-rated bulkheads above partition assemblies for continuity to the deck above.

C101003 1.1.4 Electrical Requirements

Electrically powered partitions shall be controlled by electrical switches located in the room where the partitions are stored. Electrical outlets shall be tied to the building electrical power system through over-head or end-mount base feeds.

C101003 1.1.5 Door Closure Field Test

Perform field tests as required in Paragraph C30 1.2 PERFORMANCE VERIFICATION AND FIELD TESTING.

C101003 1.2 PARTITION MATERIALS

a. Aluminum Extrusions - ASTM B221, Alloy 3003
b. Steel Sheets - ASTM A 653 / A653M
c. Fabric Coating - CFFA-W-101-B, Type II

C101003 1.2.1 OPERABLE PANEL PARTITIONS

Operable panel partitions shall be factory finished, supported from an overhead track without floor guides, and complete with hardware, track, and accessories necessary for operation.

a. Suspension System - shall consist of steel or heavy duty extruded aluminum track connected to the structural system by threaded rods, and trolleys designed to support the weight of the partition. Provide steel track of 16 gage minimum, phosphate treated and finished, or zinc or cadmium coated, or provide extruded aluminum track with minimum thickness of 1/8 inch (3.2 mm). Tracks shall have an integral ceiling guard. Trolleys shall have at least two ball bearing nylon or steel tired wheels spaced according to manufacturer's design criteria and four at an end post.

C101003 1.2.2 ACCORDION PARTITIONS

Provide full accordion type partitions, factory finished, supported from overhead track without floor guides, and complete with hardware, track, and accessories necessary for operation.

Suspension System – shall consist of steel or aluminum track and trolleys designed to support the weight of the partition. Provide steel track of 16 gage minimum, phosphate treated and finished, or zinc or cadmium coated, or provide extruded aluminum track with minimum thickness of 1/8 inch (3.2 mm). Tracks shall have an integral ceiling guard. Trolleys shall have at least two ball bearing nylon or steel tired wheels spaced according to manufacturer's design criteria and four at an end post.

C101003 1.2.3 CUBICLE TRACK AND HARDWARE

Provide heavy-duty ceiling surface mounted tracks except in ceiling heights over nine feet, hanger mounted tracks may be used, with stainless steel fasteners. Track bends shall be a minimum of 18 inches radius.

C101003 1.2.3.1 Materials

a. Extruded Aluminum Track - ASTM B 221 and ASTM B 456; alloy 6063-TS, channel shape minimum 1-1/4 inch (32 mm) wide by 1-1/8 inch (29 mm) deep, 0.050 inch (1.27 mm) minimum wall thickness.
b. Carrier Unit - Provide silent type with double canted wheel carrier. Wheels shall have nylon on stainless steel hooks with swivel to support curtain. Provide 2.2 carriers for every foot of track length plus one additional carrier.

C101004 INTERIOR GUARDRAILS & SCREENS

This paragraph covers assemblies to include interior guardrails associated with open sides of floors, but not stairs' handrails. Also included are screens and associated work to include tracks and anchoring systems.

C101004 1.1 MATERIALS

a. Structural Carbon Steel - ASTM A 36/ A 36M
b. Structural Tubing - ASTM A 500
c. Steel Pipe - ASTM A 53, Type E or S, Grade B
d. Aluminum Alloy products - Products shall conform to ASTM B 209 for sheet plate, and ASTM B 221 for extrusions, and ASTM B 26/B 26M or ASTM B 108 for castings, as applicable.

C101004 1.2 FABRICATION FINISHES

C101004 1.2.1 Galvanizing

Hot-dip galvanize steel items to be exposed to water contact. Zinc-coat steel in the largest unit possible. Galvanize per ASTM A

123/ A 123M, ASTM A 153/ A 153M or ASTM A 653/ A 653M, G90, as applicable.

C101004 1.2.2 Non-Ferrous Metal Surfaces

Protect by plating, Class I anodic coatings, or 70% polyvinylidene fluoride organic coatings. See Section C30 for additional coatings/finish information.

C101004 1.3 GUARDRAILS

Design guardrails in accordance with the IBC, except delete the handrail design load reduction for code exceptions for residential, prisons, industrial, high hazard, and storage facilities. Provide materials in accordance with NAAMM PR, and provide the same size rail and post. Provide pipe collars of the same material and finish as the handrail and posts.

C101005 INTERIOR WINDOWS

For fixed interior windows, assemblies include frames, glazing, caulking, and other associated work. For other window types, see PTS Section B20, *Exterior Enclosure*. Glazing for windows specified under this section is located in C101007, "Interior Glazing."

C101005 1.1 ALUMINUM WINDOWS

Each window unit shall be a complete factory assembled unit with or without glass installed. Fabrication of window units shall comply with AAMA 101.

a. Fixed Windows - Type F, LC25 for residential, or HC40 for non-residential (commercial).
b. Sliding Glass Pass Windows - Frames and glass channels shall be of heavy type 6063-TS aluminum extrusions. Provide 1/4-inch (6.35 mm) clear tempered glass.
c. Bullet-Resistant Pass Windows - Conform to UL classification (1 through 8) as required by the installation. Provide fixed, bullet-resistant glazing with pass tray for installations requiring high levels of security.

C101005 1.2 VISION PANELS

a. Wood Windows

Wood windows shall consist of complete units, including sash, glass, frame and hardware. Window units shall meet the Grade 40 requirements of AAMA 101. Wood members that will receive a transparent finish shall be in one piece, not finger-jointed.

b. Plastic Windows

Provide PVC windows, reinforcing members, welded corners, fasteners, hardware and anchors conforming to AAMA 101 or ASTM D 4099.

1) Windows shall be fixed or operable, as stated in the project program.

2) Material and Color - Window (PVC) color shall be a consistent color all the way through the material.

c. Hollow Metal Vision Panels – shall meet the requirements of hollow metal frames, paragraph C102001.

C101005 1.3 BULLET RESISTANT WINDOWS

Windows shall meet U.L. Classification, Rating Level 1 through 8, as required for the installation and stated in the project program. Each window shall be a complete factory-assembled unit with glass factory or field installed.

C101005 1.3.1 Glazing

Provide as specified under this section, paragraph entitled "Interior Glazing."

C101005 1.3.2 Setting Materials

Provide types required for the glazing applicable setting method specified in the GANA Glazing Manual. If sealants are employed, use elastomeric sealants, ASTM C 920, Type S or M, Grade NS, Class 12.5, Use NT.

C101005 1.4 FINISHES

Finish exposed aluminum or steel window surfaces as follows:

a. Anodic Coating

Architectural Class I (0.7 mil or thicker), designation AA-M10-C22-A41, clear (natural) or A42, integral color or A44, electrolytically deposited color anodized.

b. Organic Coating

Provide a high-performance coating in accordance with AAMA 2605 with a total dry film thickness not less than 1.2 mils (0.03 mm).

C101006 GLAZED PARTITIONS & STOREFRONTS

This paragraph covers fixed interior glazed partitions, including interior storefronts with doors. Assemblies include frames, glazing, caulking, and other associated work. See Section B20, *Exterior Enclosure*, for aluminum storefront framing components and performance requirements.

C101006 1.1 GLASS

Refer to "Interior Glazing".

C101006 1.2 SETTING AND SEALING MATERIALS

Provide as specified in the *GANA Glazing Manual*, SIGMA TM-3000 and SIGMA TB-3001, and per manufacturers recommendations.

C101007 INTERIOR GLAZING

ASTM C 1036, unless specified otherwise. Provide patterned glass where required to obscure view into bathrooms and dressing rooms.

Provide setting and sealing materials, stops and gaskets as recommended by the glass or acrylic sheet manufacturer.

Glazing thickness indicated in the following paragraphs is the minimum acceptable thickness. Provide thicker glazing if required by the code or the manufacturer for the given application.

C101007 1.1 GLASS

C101007 1.1.1 Clear Glass

Type I, class I (clear), quality q4 or q5 for patterned glass.

C101007 1.1.2 Wire Glass

Provide glazing of Type II, Class I, Form I, Quality q8 mesh stainless steel, diamond pattern, 1/4 inch (6.35 mm) thick. Glass shall comply with ASTM E 163.

C101007 1.1.3 Patterned Glass

Type II, Class 1 (translucent), Form 3 (patterned), quality q7 (decorative), Finish f2 (patterned two sides), 1/8 inch (3.2 mm).

C101007 1.1.4 Laminated Glass

Fabricate from two pieces of Type I, Class 1, quality q3 glass laminated together with a clear, 0.030 inch (0.75 mm) thick polyvinyl butyral interlayer. Total thickness shall be nominally 1/4 inch (6.35 mm).

C101007 1.1.5 Bullet-Resistant Glass

Provide bullet resistant composite glazing panel listed by UL ABPMED with a power rating corresponding to the installation prescribed, and in accordance with UL 752.

C101007 1.1.6 Tempered Glass

ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class 1 (clear), quality q3.

C101007 1.2 PLASTIC GLAZING

C101007 1.2.1 Bullet-Resistant Plastic Sheet

Bullet resistant rating in accordance with UL 752, Class I, clear in color. Only use bullet-resistant plastic sheet on existing interior windows that cannot be removed and replaced.

C101007 1.2.2 Polycarbonate Sheet

ANSI Z97.1, Mar-resistant, Clear and smooth both sides when used for

vision glazing; Translucent, textured both sides when used for obscure glazing. Mar-resistant sheet shall have a change in haze of between 5 and 8 percent under silica carbide test, 1600 grams, ASTM D 673.

Provide warranty for polycarbonate sheet glazing for a period of 5-years that includes the following:

a. Warranty Type I, Class A (UV Stabilized) sheets against breakage;
b. Warranty Type III (coated and mar-resistant) sheets against breakage and coating delamination.
c. Warranty Type IV (coated sheet) against breakage and yellowing

C101008 INTERIOR JOINT SEALANT

Sealant joint design and application shall be in accordance with the general requirements of *Sealants: A Professionals' Guide*from the Sealant, Waterproofing & Restoration Institute. Refer to manufacturers' recommendations for chemical resistance.

C101008 1.1 JOINT SEALANT TYPES FOR INTERIOR WORK

Sealants shall be paintable, and shall match the color of adjacent surfaces.

a. Vertical Surfaces - ASTM C 920, Type M, Grade NS, Class 25, Use NT.
b. Horizontal Surfaces - ASTM C 920, ASTM D 1190 for traffic surfaces, Type M, Class 25, Use T.
c. Pools and pool decks – for vertical joints, Gun grade: ASTM C 920, Type M, Grade NS, Class 25, NT; for horizontal deck traffic joints pourable: ASTM C 920, Type M, Grade P, Class 25, T
d. Food Service – Use a Vinyl Acetate Homopolymer, or other low VOC, non-toxic sealant approved for use in food preparation areas.
e. Chemical Resistance - Ensure that all sealants are chemically compatible or resistant to adjacent materials, or materials that may come into contact with the sealants in the course of the building life.

C1020 INTERIOR DOORS

Door hardware shall be as specified in "Interior Door Hardware" in this section.

C102001 STANDARD INTERIOR DOORS

This paragraph covers all standard interior wood or hollow metal doors with frames, hardware, locks, and finish.

C102001 1.1 STEEL DOORS

Hardware preparation shall be in accordance with SDI 17, ANSI/DHI A115 and ANSI/SDI 100. Doors shall be hung in accordance with ANSI/SDI 100.

C102001 1.1.1 Standard Steel Doors

ANSI A 250.8, Level 1, (occasional use, low abuse types such as closet doors without locks); Level 2, (low use, moderate abuse types such

as office/storeroom doors); Level 3, (moderate use, high abuse types such as BEQ sleeping room doors); Level 4, (high use, high abuse types such as corridors, stairways, assembly spaces, and main entry doors), with a physical performance level of 'A'. Maximum door undercut shall not exceed 3/4 inch (19 mm).

C102001 1.1.2 Sound Insulated Doors and Frames

Provide sound insulated door and frame assemblies into rooms requiring wall assemblies to be sound insulated with a Sound Transmission Class (STC) rating as required.

C102001 1.1.3 Accessories

a. Shelves for Dutch doors shall comply with SDI 111-B, and be of steel not lighter than 16 gage.
b. Louver shall comply with SDI 111-C, shall be stationary, sight-proof type. Use lightproof louvers if function of room requires darkness. Louver frames shall be 20-gage steel with louver blades minimum 24 gage.

C102001 1.2 STANDARD STEEL FRAMES

ANSI A 250.8. Form frames with welded corners for installation in masonry partitions and knock-down field assembled corners for installation in metal stud and GWB partitions. Frames shall be set in accordance with SDI 105. Form stops and beads with 20 gauge steel.

Provide a minimum of three jamb anchors and base steel anchors per frame, zinc-coated or painted with rust-inhibitive paint, not lighter the 18 gauge. Secure frames to previously installed concrete or masonry with expansion bolts in accordance with SDI 11-F. Provide mortar infill of frames in masonry walls, and gypsum board compound infill at each jamb anchor in metal frame walls.

C102001 1.3 FINISHES

a. Factory-Primed Finish. Doors and frames in non-humid, non-corrosive environments shall be factory primed with a rust inhibitive coating as specified in ANSI A 250.8. Factory prime doors on six sides of the door.
b. Zinc-Iron Alloy Coating (Galvanealed) and Factory Primed Finish
c. Fabricate interior doors and frames (for installation in such rooms as kitchens, laboratories, battery charging, utility rooms and humid areas such as shower/drying areas, areas with frequent floor mopping, or corrosive chemical atmospheres) from zinc coated steel, alloyed type, complying with ASTM A 653/ A 653M. Factory prime doors and frames as specified in ANSI A 250.8.
d. Manufacturer’s primer shall be compatible with door finish system in C30, Interior Coatings.

C102001 1.4 WOOD DOORS

C102001 1.4.1 Wood Doors and Frames

Install wood doors and frames according to workmanship requirements of the Architectural Woodwork Institute Quality Standard 900-T-4 Custom Grade. Wood door frames may only be used in residential construction.

For non-residential buildings provide extra-heavy doors for stairways, building entrances, corridors, assembly spaces, and other high use interior doors. Provide heavy duty doors for other non-residential locations and for residential buildings.

Wood doors shall be solid wood doors with wood core and solid wood edge bands. Vertical edge bands shall be one piece or laminated two-piece solid lumber to match face veneer species for natural finish wood doors. Reinforce door at all hardware attachments to door with sound grade hardwood. Horizontal edge bands shall be solid wood or structural composite lumber.

a. Stile and Rail Doors Provide premium or select grade Ponderosa pine, Douglas Fir, White Pine, or Yellow Poplar stile and rail doors conforming to WDMA I.S.6A-01. Doors shall be premium grade, heavy duty or as required by the project program.
b. Interior Flush Doors - Flush doors shall conform to WDMA I.S.6A-01. Doors shall be premium grade, heavy duty, or otherwise as required by the project program. Provide WDMA I.S. 1A-04 SCLC-5 structural composite lumber core, or staved lumber core, or PC-5 particleboard core construction. Do not use particleboard cores where it is anticipated that hardware may be screw mounted to the doors. Provide hardwood or softwood veneers cut for the best presentation for natural finishing of doors. Set match veneers of all components of a door opening. Face veneers shall be 1/20" thick before sanding.
c. Closet Doors – Provide flush, paneled, or louvered doors of premium or custom grade, conforming to WDMA I.S.1A-01, premium or custom grade, heavy duty. Doors shall be hinged or sliding.
d. Acoustical Doors and Frames - WDMA I.S 1-A-2004 WDMA I.S.6A-01. Doors shall be premium or custom grade, heavy duty as required by the project program. Provide acoustical doors in solid core, constructed for door, hardware, and frame to provide a Sound Transmission Class (STC) rating of 39 (minimum) when tested in accordance with ASTM E 90.

C102001 1.4.2 Wood Door Accessories

a. Door Louvers - Louver shall comply with SDI 111-C. Louver frames shall be 20-gage steel with louver blades minimum 24 gage.
b. Door Light Openings - Provide glazed openings with the manufacturer's standard wood moldings. Moldings for doors to receive a natural finish shall be of the same species and color of the face veneer.

C102001 1.4.3 Fabrication

a. Marking - Each door shall bear a stamp, brand or other identifying mark indicating quality and construction of the door.
b. Adhesives and Bonds - WDMA I.S. 1-A. Use Type I (water-proof) adhesive for assembly of interior doors and for the fabrication of stiles, rails, crossbands, and veneers. Adhesive for doors to receive a natural finish shall be non-staining. Type II (water resistant) is allowed for fabrication of core parts.

C102001 1.4.4 Finishes

Unless required otherwise by the project program, typically provide natural finish wood doors. Factory prime and or seal on all six sides of doors.

a. Factory Finish - Provide doors finished at the factory as follows: AWI Quality Standards Section 1500, specification for Conversion varnish, alkyd urea catalyzed polyurethane, or acrylated UV curable epoxy. The coating shall be AWI Quality Standards premium, medium rubbed sheen, with an open or closed grain effect. Poly-wrap prefinished wood doors at factory for shipping.
b. Field Finish - Prepare doors in accordance with WDMA I.S.1-A-2004. Factory prime or seal doors. Manufacturer's primer or sealer shall be compatible with door finish system in Section C30, *Interior Finishes*.
c. Plastic Laminate Finish - Factory applied, NEMA LD 3, 0.050 inch (1.27 mm) minimum thickness.

C102002 GLAZED INTERIOR DOORS

This paragraph covers all glazed interior doors with glass, frames, hardware and locking devices. See paragraph entitled "Interior Glazing" in this section for glazing options.

C102002 1.1 ALUMINUM DOORS, FRAMES AND STOREFRONT

Provide swing-type aluminum doors and frames complete with framing members, transoms, side-lites, and accessories. Fabricate of ASTM B 221, Alloy 6063-TS for extrusions.

C102002 1.2 FABRICATION

C102002 1.2.1 Aluminum Frames

Provide frames with removable glass stops and glazing beads to accommodate fixed glazing. Countersink screws for exposed fastenings. Jointing of framing members shall obtain hairline fit, be reinforced, and mechanically secured.

C102002 1.2.2 Aluminum Doors

Doors shall be not less than 1-3/4 inches (44 mm) thick, with a minimum

wall thickness of 0.125 inch (3.2 mm), except beads and trim, 0.050 inch (1.27 mm). Full glazed stile and rail doors shall have medium or wide stiles and rails. Maximum water leakage of the door and frame shall be "no uncontrolled water penetrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation." Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.

C102002 1.2.3 Welding and Fastening

Locate welds and fasteners on unexposed surfaces, where possible. Exposed welds shall be dressed smoothly. Exposed fasteners shall have counter-sunk heads. Weld concealed reinforcements for hardware in place. Hardware reinforcements shall be of stainless steel or steel with a hot-dipped galvanized finish, and shall be secured with stainless steel screws.

C102002 1.2.4 Finishes

Provide exposed aluminum surfaces with factory finish of anodic or organic coating. Anodic coatings shall conform to AA 45, with an Architectural Class I finish, 0.7 mil or thicker. Organic coatings shall be a baked enamel finish in accordance with AAMA 2605 with a total dry film thickness not less than 1.2 mil. Exposed fasteners to match the door finish.

C102003 FIRE DOORS

This paragraph covers all interior fire doors, including all necessary frames, hardware, closing devices, and alarms associated with the door.

C102003 1.1 FIRE AND SMOKE DOORS AND FRAMES

Provide in conformance with NFPA 80 an NFPA 105. Fire doors and frames shall bear the label of UL, FM or WHI attesting to the rating required. Door and frame assemblies shall be tested for conformance per NFPA 252 or UL 10C (for positive pressure). Wood fire doors shall also comply with ASTM E 152.

Provide stainless steel astragals complying with NFPA 80 for fire-rated assemblies and NFPA 105 for smoke control assemblies.

C102004 SLIDING AND FOLDING DOORS

Provide paneled or louvered closet doors of premium or custom grade, conforming to WDMA I.S.6A-01, heavy duty. Doors shall be sliding or bi-folding, as required by the program.

C102005 INTERIOR OVERHEAD DOORS

Refer to RFP PART 4, B20 Exterior Enclosure - "Overhead Roll-Up and Overhead Sectional Doors" for interior overhead door requirements. Design for ASCE 7 wind loading not required for interior overhead doors.

C102006 INTERIOR GATES

Any special type gate installed in the interior of a facility, including frames, hardware, hoisting devices, finish, and other associated work.

C102007 INTERIOR DOOR HARDWARE

C102007 1.1 DOOR HARDWARE

Provide the services of an Architectural Hardware Consultant (AHC), Certified Door Consultant (CDC), or an Electrified Hardware Consultant (EHC) to assist the Designer of Record in preparation of the door hardware schedule and product selection. The hardware consultant shall sign and seal the door hardware construction submittal. Provide, as far as feasible, locks, hinges, pivots, and closers from one lock, hinge, pivot, or closer manufacturer's make. All door hardware shall be clearly and permanently marked by the manufacturer, on a location to be visible after installation. Modify hardware as necessary to provide features indicated or specified. For necessary hardware items not indicated in these specification sections, provide ANSI/BHMA grade 1 rated hardware.

C102007 1.1.1 Hardware for Fire Doors

All hardware provided shall meet the requirements of NFPA 80 for Fire Doors and NFPA 101 for exit doors. Hardware shall bear the label of Underwriter's Laboratories, Inc., and be listed in UL BMD or labeled and listed by another testing laboratory acceptable to the contracting officer. Comply with NFPA 105 for smoke control assemblies.

C102007 1.1.2 Hinges

BHMA A156.1, Grade 1, 4-1/2 x 4-1/2 inches (108 x 108 mm) with non-removable pin or anti-friction bearing hinges.

C102007 1.1.3 Locks and Latches

For non-residential buildings use Series 1000, Operational Grade 1, Security Grade 2 for stairways, building entrances, corridors, assembly spaces, and other high use interior doors. Use Series 4000, Grade 1 for non-residential locations not using Series 1000 hardware. For residential buildings use Series 4000, Grade 2 for interior doors.

a. Mortise Locks and Latches - BHMA A 156.13, Series 1000, Operation Grade 1, Security Grade 2.
b. Bored Locks and Latches - BHMA A 156.2, Series 4000, Grade 1, or Grade 2.

C102007 1.1.4 Combination Locks

BHMA A 156.2. Heavy-duty, mechanical combination lockset with 5 pushbuttons, standard-sized knob or lever, 3/4-inch (19 mm) deadlocking latch, 2-3/4 inch (70 mm) back-set. Provide deadbolt key override option. Safelock, Simplex, and Venn are acceptable manufacturers. Provide a hardware grade equivalent to Grade 1, series 4000. Provide a 5-year parts and labor warranty.

A door into a sensitive area shall be fitted with a GSA-approved

pedestrian door deadbolt meeting Federal Specification FF-L-2740 Heavy-duty, combination Electromechanical Deadbolt lock for pedestrian doors, with a drill resistant dial ring mounting plate, 2-3/4 inch (70 mm) back-set, with Automatic Lock Reset, High-Security combination scramble, and resistant to all forms of external manipulation and environmental attack. Three Modes of Operation: 1) The Single Combination Mode allows access by dialing a six-digit combination. 2) The Dual Combination Mode allows access only when two separate codes are entered within 10 seconds of one another. 3) The Supervisory/Subordinate Mode allows access by a subordinate only after a supervisor code has been entered. Audit Feature: Lock shall have a full complement of auditing features, including non-resettable openings log, and unsuccessful attempts log (audits after 3 unsuccessful attempts) that resets once the proper access code is entered. Lock must generate its own electrical energy with each turn of the dial, with no batteries or wires required. Lock must be designed to fit industry standard door mounting pattern.

C102007 1.1.5 Card Key System

Provide card key type access units for specialized entries as required by the program. Provide lithium battery powered, magnetic stripe keycard locksets that are ANSI/BHMA A156.13, Series 1000, Grade 1, mortise or ANSI/BHMA A156.2, Series 4000, Grade 1, cylindrical locks, tamper resistant, UL listed with 1 inch (25 mm) throw deadbolt, 3/4-inch (19 mm) throw latch bolt, auxiliary dead-locking latch, and 2-3/4 inch (68.75 mm) backset. The latch bolt and the dead bolt shall be operated simultaneously by rotating inside lever. Locks with mechanical override lock cylinders are not acceptable. Locks shall be operated only by a correctly encoded keycard. Use of a newly issued keycard automatically re-keys the lock and voids the previous keycard. The lock shall re-lock immediately after outside lever is turned and latch retracted. Locks shall have memory that is capable of recording up to 140 entries into each room, identification of the keycard used to access the room, the date and time of entry. Entry information of the lock shall be retrievable by a data key that can be inserted into the lock and then taken to the front desk printer to display information. Other components that are required for this system at the front desk are a personal or laptop computer, printer and encoder to program each key.

For exit device locks with card key access, provide mortise type, narrow stile exit devices with 24 volt DC, solenoid option for card key exterior access at aluminum storefront doors. Provide mortise type exit devices with 24 volt DC, solenoid option with alarm and remote exterior access for card key access at insulated hollow metal doors. The alarmed exit device shall sound when exiting only.

System shall be capable of accepting a minimum of 12 keycard access levels, security auditing and computer interfacing with the existing or new management system. Provide a single point of contact customer service representative accessible by telephone with a 10-digit telephone number without additional dialing hierarchies except that a maximum 4-digit extension is permissible. On-site service shall be provided within 3 hours from request within the first 12 months of occupancy. Provide a 5-year parts and labor warranty.

C102007 1.1.6 Exit Devices

BHMA A 156.3, Grade 1. Touch bars shall be provided in lieu of conventional crossbars and arms. Use manufacturer's integral touch bars in aluminum storefront doors.

C102007 1.1.7 Cylinders and Cores

Provide cylinders and cores for new locks, including locks provided under other sections of this specification. Cylinders and cores shall have seven pin tumblers. Cylinders shall be products of one manufacturer, and cores shall be the products of one manufacturer. Rim cylinders, mortise cylinders, and knobs of bored locksets shall have interchangeable cores, which are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core.

C102007 1.1.8 Keying System

Provide a master key system for the facility unless more than one tenant/tenant command shall reside in a facility. Provide a grand master keying system, or great, grand master keying system if multiple tenants or multiple buildings are required. Provide an extension of the existing keying system for existing facility additions. Name the manufacturer of the existing locks, and indicate if they have interchangeable cores. Provide construction interchangeable cores when subcontractors require keys during construction.

The Contractor shall coordinate a keying system meeting. The Contractor's Project Manager, Superintendent, Hardware Subcontractor, Electrical Subcontractor (if keying hardware is electric), Designer of Record, Contracting Officer, Public Works Base Hardware Specialist, and the Using Activity shall attend this meeting to establish the keying system for the project. This meeting is intended to identify base limitations, the necessary security, and access control within the facility. The meeting shall produce a marked up copy of the floor plan indicating the doors to receive locks and the doors to be keyed together, and any master keying or grand master keying

C102007 1.1.9 Keys

Furnish one file key, one duplicate key and one working key for each key exchange and for each master and grand master keying system.

C102007 1.1.10 Key Cabinet and Control System

BHMA A 156.5 Provide key cabinet with 25% more key hooks than required for interior and exterior doors.

C102007 1.1.11 Lock Trim

Cast, forged or heavy wrought construction and commercial plain in design.

a. Knobs and Roses - Knobs and roses shall meet test requirements

of BHMA A 156.2 and BHMA A 156.13.

b. Lever Handles - Provide lever handles in lieu of knobs, as required by DoD ABAAS. All lever handles shall have the freewheeling feature.

C102007 1.1.12 Door Bolts

BHMA A 156.16. Provide automatic latching flush bolts for double doors with both door leafs active, BHMA A 156.3, Type 25.

C102007 1.1.13 Closers

BHMA A 156.4, Series C02000, Grade 1, with PT 4C, 1-1/2 inch piston, heavy duty forged arm, with full size cover.

C102007 1.1.14 Overhead Holders

BHMA A 156.8, Grade 1.

C102007 1.1.15 Closer Holder-Release Devices

BHMA A 156.15, Grade 1.

C102007 1.1.16 Door Protection Plates

Provide armor, mop, and kick plates conforming to BHMA A 156.6. Provide door kick plates on all doors with closers and doors leading to corridors or circulation spaces. Provide armor plates on all doors that receive cart traffic. Provide mop plates on all doors in rooms that have a mop-able floor finish.

C102007 1.1.17 Door Stops and Silencers

BHMA A 156.16, Type L03011, three per single door and four per double door.

C102007 1.1.18 Thresholds

BHMA A 156.21.

C102007 1.1.19 Door Gasketing

BHMA A 156.22. Use light-proof gasketing for room functions that require darkness and integral sound-proof gasketing on acoustically rated doors.

C102007 1.1.20 Finishes

Provide one of the following hardware finish systems, matching the exterior hardware finish system.

a. BHMA A156.18. Hardware shall have BHMA 630 finish (satin stainless steel), unless specified otherwise. Provide items not manufactured in stainless steel in BHMA 626 finish (satin chromium plated) over brass or bronze, except surface door closers which shall have aluminum paint finish, and except steel

hinges which shall have BHMA 652 finish (satin chromium plated). Hinges for exterior doors shall be stainless steel with BHMA 630 finish or chromium plated brass or bronze with BHMA 626 finish. Exit devices may be provided in BHMA 626 finish in lieu of BHMA 630 finish except where BHMA 630 is specified under paragraph entitled "Hardware Sets". Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors.

b. BHMA A156.18. Hardware shall have BHMA 612 finish (satin bronze), unless specified otherwise. Surface door closers shall have bronze paint finish. Steel hinges shall have BHMA 639 finish (satin bronze plated). Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors. Hardware showing on interior of bathrooms, shower rooms, toilet rooms, washrooms, laundry rooms, and kitchens shall have BHMA 629 finish (bright stainless steel) or BHMA 625 finish (bright chromium plated).

C102090 OTHER INTERIOR SPECIALTY DOORS

C102090 1.1 ACCESS DOORS

Provide manufactured access doors and frames of 16-gage steel minimum with concealed pivots or a continuous piano hinge and flush stainless steel cam latch. Finish with manufacturer's standard primer coat finish and paint to match the wall or ceiling unless a stainless steel finish is required in the Project Program. Provide UL Rated access doors in fire rated assemblies. Access panels located in furred wall spaces shall have an inserted material to match adjacent wall surface. Size access doors large enough to allow convenient hand and tool access and operation of controls and equipment beyond the door. If maintenance of controls or equipment beyond the door requires removal, size access door to allow removal and reinstallation of new equipment through the access door. Provide access panels capable of receiving finish material inserts in visible wall locations of habitable spaces.

C102091 OTHER INTERIOR PERSONNEL DOORS

Interior personnel doors not described by the assembly categories listed above.

C1030 SPECIALTIES

C103001 COMPARTMENTS, CUBICLES AND TOILET PARTITIONS

This paragraph covers assemblies for individual compartments, cubicles, toilet partitions and urinal screens.

C103001 1.1 TOILET PARTITIONS

FS A-A-60003. Provide toilet compartments at multi-fixture toilet rooms of Type I, Style B-Ceiling Hung, C-Overhead Braced, or F-Overhead braced-alcove. Reinforce panels to receive partition-mounted accessories. Steel and Plastic toilet partitions shall have a recovered materials content of 20 to 30 percent.

C103001 1.2 URINAL SCREENS

FS A-A-60003. Type III, Style A, floor supported and wall hung or Style D, wall hung. Wall hung urinal screens shall be secured with continuous flanges to urinal screen and wall.

C103001 1.3 HARDWARE AND FITTINGS

Chrome-plated or stainless steel door latches and coat hooks. Provide one coat hook per compartment door. Latches and hinges for handicapped compartments shall comply with DoD ABAAS.

C103001 1.4 FINISHES

Finishes shall comply with FS A-A-60003. Use only one type of partition per building.

a. Metal toilet partitions and urinal screens shall be made of stainless steel.
b. Solid plastic partitions shall be fabricated of polymer resins (polyethylene) formed under high pressure forming a single component section one inch thick. Color shall extend throughout the panel thickness.
c. Phenolic core panels.
d. Laminated plastic partitions are acceptable in low or limited use applications (one or two toilet stalls per toilet room).

C103002 TOILET AND BATH ACCESSORIES

This paragraph covers toilet and bath accessories including, but not limited to, soap dispensers, paper holders, towel receptacles, grab bars, and bathroom mirrors.

C103002 1.1 TOILET AND BATH ACCESSORIES

C103002 1.1.1 Toilet Tissue Dispensers

Provide surface or recessed mounted dispensers fabricated of stainless steel. Provide one horizontally or vertically mounted double-roll dispenser per toilet compartment, unless otherwise indicated.

C103002 1.1.2 Paper Towel Dispensers

Provide one per pair of sinks in toilet rooms without electric hand dryers, and one per room with electric hand dryers, unless otherwise indicated. Provide surface or recessed mounted towel dispenser constructed of a minimum 0.7mm 0.03 inch Type 304 stainless steel.

C103002 1.1.3 Combination Paper Towel Dispenser / Waste Receptacle

Provide a recessed or semi-recessed type with a capacity of 400 sheets of C-fold, single-fold, or quarter-fold towel and be constructed of 22-gage stainless steel. Provide one per pair of sinks, unless otherwise indicated. Provide the towel compartment door with a

tumbler key lock locking mechanism.

C103002 1.1.4 Sanitary Napkin Disposal Units

Units shall be toilet partition or wall mounted of not less than 22 gage stainless steel, with top and bottom hinged access doors. Provide one in each Woman's toilet stall, unless otherwise indicated. Each unit shall have leak-proof receptacle for disposable liners. Provide fifty disposable liners of the type standard with the manufacturer.

C103002 1.1.5 Medicine Cabinets

Provide units with plate or float glass mirrors on doors. Provide doors and frames of 16-gage steel with a continuous piano hinge and flush magnetic latch.

C103002 1.1.6 Towel Bars

Provide stainless steel towel bars with a minimum thickness of 0.015 inch (0.4 mm).

C103002 1.1.7 Grab Bars

Provide stainless steel grab bars per DoD ABAAS.

C103002 1.1.8 Robe Hooks

Provide stainless steel two-hook shape with integral wall flange, with a projection not less than 1-5/8 inches (41 mm).

C103002 1.1.9 Mirrors

Provide one manufactured framed electro-copper plated mirror per sink, or one full-size mirror for all sinks, unless otherwise indicated.

C103002 1.1.10 Soap Dispensers

Provide one soap dispenser per two sinks, with mechanical action dispensing valve. Do not mount soap dispenser on mirror. Surface mounted liquid type shall consist of a vertical Type 304 stainless steel tank with holding capacity of 1.2L (40 fluid ounces) with a corrosion-resistant all-purpose valve.

C103002 1.1.11 Electric Hand Dryer

Provide wall mount and electric hand dryer designed to operate at 110/125 volts, 60 cycles, single phase alternating current with a heating element core rating of a maximum 2100 watts. Provide dryer housing of single piece construction and of chrome plated steel. Provide one unit per three sinks, unless otherwise indicated.

C103003 MARKER BOARDS AND TACK BOARDS

This paragraph covers all marker boards, tack boards and fastening devices.

C103003 1.1 MATERIALS

a. Porcelain Enamel - Marker board writing surface shall be composed of porcelain enamel fused to a nominal 28 gage thick steel sheet, laminated to a 1/4-inch (6.35 mm) thick core material with a steel or foil backing sheet.
b. Cork shall be a continuous resilient sheet made from soft, clean, granulated cork, relatively free from hardback and dust and bonded with a binder suitable for the intended purpose. The cork sheet shall have a tensile strength of not less than 40 PSI (275.8 kPa) when tested in accordance with ASTM F 152.
c. Tack-board Covers - Provide woven fabric or vinyl wall covering over cork tack surface.
d. Aluminum - Aluminum frame extrusions shall be alloy 6063-T5 or 6063-T6, conform to ASTM B 221, and be a minimum of 0.06 inches (1.5 mm) thick.
e. Hardwood - Exposed hardwood for frames, cabinets and cases shall be oak, walnut or mahogany, with a factory applied stain and lacquer finish.
f. Glass - Provide tempered glass in accordance with ANSI Z97.1 and in conformance with ASTM C 1048.

C103003 1.2 PRESENTATION BOARD

The presentation board shall be a laminate covered wall-hung cabinet with lockable doors. Doors are to be attached to the cabinet with continuous piano hinges, and have a catch or closure to keep doors closed when not in use. The interior of the cabinet shall contain a porcelain enamel marker board writing surface with chalk-tray, a flip chart that can be hung on an interior door panel, and fabric covered tack surface on the interior door panels.

a. Marker Board - Marker board shall be a factory assembled, one-piece unit, and have a 28 gauge nominal steel porcelain enamel writing surface and a chalk-tray with end closure. Frame shall be aluminum, powder-coated steel, oak, walnut or mahogany.
b. Tack Board - Tack boards shall consist of a minimum 1/4-inch (6.35 mm) thick natural cork laminated to a minimum 1/4-inch (6.35 mm) thick hardboard, shall have an oak or aluminum frame, and be vinyl or fabric covered. Covers shall have a Class 'A' flame spread rating of 0-50, and a smoke developed rating of 0-450 in accordance with ASTM E 84.

C103004 IDENTIFYING DEVICES

This paragraph covers all signs, plaques, and traffic markers.

C103004 1.1 ASSEMBLIES

The signage system assemblies shall consist of three primary elements; a structural rail (with coordinating rail joiners to increase sign height in the field), removable copy inserts, and interlocking end caps or frame, and trim.

C103004 1.1.1 Inserts

The signage rails shall be designed as to accept ABS plastic signage inserts.

C103004 1.1.1.1 Insert Fabrication

The insert is the signage member to which message signage copy in the form of letters, numbers, and symbols shall be applied, and shall be interchangeable with similar sized rails of any other sign of equal or greater width and height. The ends of the rail and insert assembly shall be enclosed by end caps of prefinished 6064T5 extruded aluminum. Inserts shall be fabricated from 0.090 minimum ultra-violet resistant thickness extruded ABS Acrylic sheet core with 20.003 polycarbonate non-glare clear cap bonded to the core during the extrusion texturing process.

C103004 1.1.2 End Caps

End caps shall be injection-molded ABS plastic with integral color. The end caps shall be interchangeable to either end of each sign type, and any other similar sign of equal height. The end caps shall be interlocking mechanically with the inserts, and rail, requiring no tools for assembly. End caps shall utilize straight corners (instead of radius corners). Spring clips shall be steel. Plastic spring clips are not acceptable.

C103004 1.1.3 Trim

Optional accessory top and bottom trim frames of prefinished (color as indicated 6063T5 extruded aluminum shall be provided to the signage types indicated.

C103004 1.1.4 Mounting

Mounting of the modular signage system shall include surface mounting with screw-on applications for interior and exterior walls and on selected doors as indicated, at the locations indicated, and other mounting devices as indicated.

C103004 1.1.5 Graphics Application

a. Tactile Letters and Symbols

Chemically weld tactile letters and symbols to front surface of signage inserts where indicated and where required by DoD ABAAS. Tactile letters and symbols shall be sized as indicated.

b. Braille

Grade II Braille. Provide Grad II Braille inlaid strip as indicated to match sign color.

C103004 1.2 ALUMINUM ALLOY PRODUCTS

Provide ASTM B 209 for aluminum sheet or plate, ASTM B 221 for aluminum extrusions and ASTM B 26/B 26M or ASTM B 108 for aluminum castings. Provide

aluminum extrusions at least 1/8-inch (3.2 mm) thick and aluminum plate or sheet at least 16 gage thick. Provide aluminum castings of solid aluminum cast certified by AA 46 alloy designation B443.0. Where anodic coatings are specified, alloy shall conform to Aluminum Association's alloy designation 514.0 or A514.0.

C103004 1.2.1 Aluminum Finishes

Provide exposed aluminum finishes with either mill finish, factory finished with anodic coating or organic coating. Anodized finishes shall conform to AA 45, Architectural Class I or II, with a coating thickness 0.7 mil or thicker. Organic coatings shall be a baked enamel finish with a dry film thickness not less than 1.2 mils, conforming to AAMA 605.2.

C103004 1.3 STEEL PRODUCTS

Provide ASTM A 36/A 36M for structural steel, ASTM A 167 for sheet and plates.

C103004 1.4 CAST METAL

a. Cast Aluminum, ASTM B 108
b. Cast Bronze, ASTM B 62

C103004 1.5 GLASS

ASTM C 1036, Type 1, Class 1, Quality q3

C103004 1.6 FIBER-REINFORCED POLYESTER (FRP)

ASTM D 3841, Type II, Grade 1

C103004 1.7 ACRYLIC SHEET

ASTM D 4802, Type III

C103004 1.8 POLYCARBONATE SHEET

SAE AMS 3611

C103004 1.9 EXTERIOR POST AND PANEL SIGNS

C103004 1.9.1 Posts and Panels

Provide one-piece extruded aluminum posts with not less than 0.125 inch (3.2 mm) wall thickness. Posts shall permit attachment of panel framing system. Provide cap for each post. Panel framing system shall consist of aluminum extrusions and interlocking track components designed to interlock with concealed fasteners. Panels shall be fabricated of rectangular extruded tubular aluminum with a minimum wall thickness of 0.125 inches. Panels shall be removable and interchangeable. Posts shall be embedded in solid concrete foundation.

C103004 1.9.2 Illumination

Provide concealed lighting within panel framing members. Provide T-12 slim-line lamps,. Ballast shall be integrally mounted with high power factor and rated for use in up to minus 20 degrees F (minus 29 degrees C) ambient starting temperature.

C103005 LOCKERS

C103005 1.1 STEEL CLOTHING LOCKERS

C103005 1.1.1 FS AA-L-00486 (Rev J), enameled steel.

Provide ventilated, Single Tier Units (unless multi-tier permitted by Project Program), fully framed. Provide galvanized or galvaneal shelves and bottoms for all lockers, and fully galvanized or galvaneal lockers in locker spaces adjoining shower rooms. Provide full height door stiffeners.

C103006 SHELVING

Assemblies include all types of shelving with brackets and all supporting materials and finish, if required.

C103007 FIRE EXTINGUISHER CABINETS

Cabinet shall be constructed of 16 gauge cold-rolled steel door panel / front, and a 22 gauge cold-rolled steel tub. Cabinet shall be fire-rated if located in a fire rated wall assembly, and have a full-length piano hinge, and baked enamel finish. Provide a stainless steel cabinet door if cabinet is exposed to the environment. Size and locate fire extinguisher cabinets to encase extinguisher as required by NFPA 10 & 101.

C103008 COUNTERS

C103008 1.1 LAMINATE COVERED COUNTER TOPS

Fabricate with lumber and a core of exterior grade plywood (A-C Grade) or particleboard (ANSI A208.1, Grade 1-M-2 or better), glued and screwed to form an integral unit. Bond laminated plastic under pressure to exposed surfaces using manufacturer’s recommended glue.

a. Countertops shall be constructed to meet "Custom" quality grade as defined in AWI Quality Standards.
b. Finish shall meet NEMA LD 3, Grade PF 42 for plastic laminate.

C103008 1.2 ACRYLIC COUNTER TOPS

Provide 100% acrylic counter tops for use in non-residential construction.

Solid surfacing material shall consist of 100% pure acrylic polymer, mineral fillers, and pigments. The material shall be homogenous, not coated or laminated. Superficial damage to a depth of 0.010 inch (.254 mm) shall be repairable by sanding or polishing. Install with factory recommended fasteners/adhesives/sealant. Provide the following performance characteristics:

a. Tensile strength, ASTM D 638: 5800 psi minimum
b. Hardness, ASTM D 2583: Barcol Impressor 55 minimum
c. Flammability, ASTM E 84: Class I/A, flame spread 25 maximum; smoke developed 30 maximum
d. Thermal Expansion, ASTM D 696:.00002 in/in/F maximum
e. Boiling water resistance, NEMA LD 3: No effect
f. High temperature resistance, NEMA LD 3: No effect
g. Liquid absorption, ASTM D 570 (24 hours): 0.10 percent maximum
h. Mold and mildew growth, ASTM G 21: No growth, no effect
i. Bacteria growth, ASTM G 22: No growth, no effect
j. Sanitation, NSF 51: "Food Contact" approval for food area applications
k. Impact resistance, NEMA LD 3 (1/2 lb. ball drop): 1/4 inch material, 36 inch drop, no failure 1/2 inch material, 120 inch drop, no failure

C103009 CABINETS

This paragraph includes casework items that are permanently fixed in-place. Included are all cabinetry and millwork items with their associated accessories and anchoring devices.

C103009 1.1 WALL AND BASE CABINETS

Wall and base cabinets shall be of the same construction and appearance, with solid ends and frame fronts, or with frames all around. Frames shall be not less than 3/4 inch by 1 1/2 inches (19 mm by 38 mm) hardwood. All ends, bottoms, backs, and partitions shall be hardwood plywood. Cabinet doors and drawer fronts shall be a minimum 3/4 inch (19 mm) of either plywood or medium density fiberboard cores with solid edge bands.

C103009 1.1.1 Quality Standards

Wall and base cabinets shall be constructed to meet "Custom" quality grade as defined in AWI Quality Standards, except where this specification exceeds AWI Custom.

C103009 1.1.2 Hardware

Provide cabinet hardware including two self-closing hinges for each door and two side-mounted metal drawer slides for each drawer and pulls for all doors and drawers as follows. All cabinet hardware exposed to view shall be ANSI/BHMA 156.9, Grade 1, and comply with the following requirements:

a. Concealed Euro-Style, back mounted hinges with opening to 165 degrees and a self-closing feature at less than 90 degrees.
b. Drawer slides shall have a static rating capacity of 100 lbs. (444 N).
c. Provide adjustable shelving standards with shelf support hardware for wall cabinets.
d. Provide heavy-duty magnetic latch and door and drawer catch

C103009 1.1.3 Finish

Provide plastic laminate (NEMA LD3) or transparent finish with sealer and varnish as selected by Designer of Record.

C103010 CASEWORK

This paragraph includes all built-in premanufactured metal cabinetry for specialized functions such as labs, libraries, medical and dental facilities. At a minimum, all casework shall conform to the following chart:

Metals	Thickness and Material
Uprights (all)	
Horizontal foot	4" x 2" tube, 14 ga. (.075") HRPO Steel
Vertical upright	6" x 2" tube, 11 ga. (.118") HRPO Steel
Leveler	Threaded steel with plastic foot and rubber boot
Bridge Channels	
Channel (halves)	14 ga. (.075") CQCR Steel
Utility Rails	
Top and Bottom Channels	18 ga. (.047") CQCR Steel
Covers	18 ga. (.047") CQCR Steel
Dividers	16 ga. (.059") CQCR Steel
End Brackets	22 ga. (.030") CQCR Steel
Top Stretchers	
Channel	14 ga. (.075") CQCR Steel
End Brackets	18 ga. (.047") CQCR Steel
Vertical Utility Chase	
Chase Assembly	
Upper Chase Cover	
Cover	16 ga. (.059") CQCR Steel
Middle Chase Cover	
Cover	16 ga. (.059") CQCR Steel
Lower Chase Cover	
Cover	16 ga. (.059") CQCR Steel

Attachment Bracket	11 ga. (.118") CQCR Steel
Chase Cover	
Panel	18 ga. (.047") CQCR Steel
Bridge Cover Extension	
Panel	18 ga. (.047") CQCR Steel
Chase Cabinet Filler	
Panel	18 ga. (.047") CQCR Steel
Cantilever	
Cantilever	11 ga. (.118") HRPO Steel
End Panel	
Outer Cover	11 ga. (.118") HRPO Steel
Inner Cover	20 ga. (.036") CQCR Steel
Angle Bracket	16 ga. (.059") CQCR Steel
Shelves	
Shelf (all)	16 ga. (.059") CQCR Steel
End Panels (all)	14 ga. (.075") CQCR Steel
Reinforcement Channel (Flat and Seismic Flat Shelves)	16 ga. (.059") CQCR Steel
Seismic Shelf Support Lip	20 ga. (.036") CQCR Steel
Laminate Overhead Storage Cabinets	
Hanger bracket	14 ga. (.075") CQCR Steel
Solid door pull	Steel, aluminum or zinc
Glass door pull	Steel
Glass door track	Aluminum
Reinforcing hat channel for shelf	11 ga. (.118") HRPO Steel
Steel Overhead Storage Cabinets	
Sides, Back and Door	20 ga. (.036") CQCR Steel
Top, Bottom and Shelf	18 ga. (.047") CQCR Steel

Hanger bracket	14 ga. (.075") CQCR Steel
Solid door pull	Steel, aluminum or zinc
Glass door pull	Steel
Glass door track	Aluminum
Reinforcing hat channel for shelf	11 ga. (.118") HRPO Steel

Laminate Storage and Sink Cabinets

Drawer glides	Steel rails with ball bearings
Door hinges	Steel
Door and Drawer pulls	Steel, aluminum or zinc
Leveler bracket	11 ga. (.118") HRPO Steel
Leveler	Threaded steel with plastic foot and rubber boot
Reinforcing hat channel for shelf	11 ga. (.118") HRPO Steel

Steel Storage and Sink Cabinets

Sides, Back and Top	20 ga. (.036") CQCR Steel
Base, Bottom and Shelf	18 ga. (.047") CQCR Steel
Door (interior and exterior panels)	20 ga. (.036") CQCR Steel
Drawer glides	Steel rails with ball bearings
Door hinges	Steel
Door and Drawer pulls	Steel, aluminum or zinc
Leveler bracket	11 ga. (.118") HRPO Steel
Leveler	Threaded steel with plastic foot and rubber boot
Reinforcing hat channel for shelf	11 ga. (.118") HRPO Steel

Cord Reel

Cord Reel	11 ga. (.118") HRPO Steel

Cable Storage Tray

Tray	24 ga. (.024") CQCR Steel
Phenolic Drying Rack	
Mounting brackets, in-line	14 ga. (.075") CQCR Steel
Mounting brackets, end-of-bench	14 ga. (.075") CQCR Steel
Modular Power Block with GFCI Receptacle	
Housing and back bracket	16 ga. (.059") CQCR Steel
Modular Connector Faceplates	
Faceplate	16 ga. (.059") CQCR Steel
Non-Metals	Thickness and Material
Laminate Worksurfaces	
Worksurface core	1.12" X 45 lb/cu ft medium density particle board
Top and bottom laminate (standard)	.012" thick laminate
Front edge banding	3mm thick rigid plastic
Side and back edge banding	1mm thick, flat profile rigid plastic
ChemsurfÂ® Chemical-Resistant Laminate Worksurfaces	
Worksurface core	1.12" X 45 lb/cu ft medium density particle board
ChemsurfÂ® (option)	VGP grade, resin-impregnated kraft paper
Front edge banding	3mm thick rigid plastic
Side and back edge banding	1mm thick, flat profile rigid plastic
Phenolic Resin Worksurfaces	
Worksurface core	.75" thick, phenolic resin-impregnated kraft paper
Phenolic Drying Rack	
Panel	1.00" thick, phenolic resin-impregnated kraft paper
Pegs	.38" dia x 5" long polypropylene pegs

Phenolic Drip Trough

Trough	1.00" thick, phenolic resin-impregnated kraft paper
Drain tube	.50" OD rigid phenolic tube
Drain flexible tube	.50" OD x 3' long flexible clear PVC tubing

Laminate Overhead Storage Cabinets

Panel core (Top, Bottom, Ends, Back, Door, Shelf)	.75" X 45 lb/cu ft industrial grade particle board
Laminate	.012" thick laminate
Cabinet edge banding	1mm thick, flat profile rigid plastic
Door edge banding	2mm thick, flat profile rigid plastic
Glass door	.25" thick tempered safety glass

Steel Overhead Storage Cabinets

Glass door	.25" thick tempered safety glass

Laminate Storage and Sink Cabinets

Panel core (Top, Bottom, Base, Ends, Back, Door, and Shelf)	.75" X 45 lb/cu ft industrial grade particle board
Laminate	.012" thick laminate
Cabinet edge banding	1mm thick, flat profile rigid plastic
Drawer/Door edge banding	2mm thick, flat profile rigid plastic
Drawer/Door stop	Rubber

Steel Storage and Sink Cabinets

Drawer/Door stop	Rubber

Power Block

Housing	Ultramid Nylon

Harness-to-Harness Connector

Housing	Ultramid Nylon

Duplex Receptacles

Housing	Ultramid Nylon

Modular Harnesses and Multipurpose
Power Infeeds

Connector housing	Ultramid Nylon

Wire Manager

Channel	Rigid plastic

C103011 CLOSETS

This paragraph includes all built-in closets with associated work and finishes.

C103012 FIRESTOPPING PENETRATIONS

This paragraph covers fire-stopping assemblies to include sleeves, caulking and flashing. See PTS Section D40, *Fire Protection*, for additional requirements.

C103012 1.1 FIRESTOPPING

Provide firestopping materials, supplied from a single domestic manufacturer, consisting of commercially manufactured, asbestos-free, nontoxic products that are FM Approval Guide approved, or UL listed, for use with applicable construction and penetrating items, complying with the following minimum requirements.

C103012 1.1.1 Fire Hazard Classification

Material shall have a flame spread of 25 or less, and a smaoke developed rating of 50 or less, when tested in accordance with ASTM E84 or UL 723. Material shall be an approved firestopping material as listed in UL Fire Resistance Directory or by a nationally recognized testing laboratory.

C103012 1.1.2 Toxicity

Material shall be nontoxic and carcinogen free to humans at all stages of application or during fire conditions and shall not contain hazardous chemicals or require harmful chemicals to clean material or equipment. Firestop material must be free from Ethylene Glycol, PCB, MEK, or other types of hazardous materials.

C103012 1.1.3 Firestopping Rating

Firestop systems shall be UL Fire Resistance Directory listed or FM Approval Guide approved with "F" and "T" rating at least equal to the fire-rating of the fire wall or floor in which penetrating openings are to be protected.

C103012 1.1.3 Through-Penetrations

Firestopping materials for through-penetrations shall provide "F", "T", and "L" fire resistance ratings in accordance with ASTM E814 or UL 1479.

C103013 SPRAYED FIRE-RESISTIVE MATERIALS

See PTS Section D40, *Fire Protection*, for additional requirements.

C103013 1.1 SPRAYED FIRE-RESISTIVE MATERIALS

C103013 1.1.1 Quality Assurance

A pre-installation conference shall be held with the manufacturer’s approved installer prior to the application of the sprayed fire-resistive materials. See Paragraph C10 1.2 for field testing requirements for the fire-resistive material. Products provided shall not contain asbestos per 40 CFR 763.

C103013 1.1.2 Warranty

Contractor shall provide manufacturer's standard materials and workmanship warranty stating that the manufacturer agrees to repair or replace materials that fail within 2 years, or as required by the project program, from date of Substantial Completion.

C103013 1.1.3 Material Composition

Provide sprayed fire-resistive material consisting of factory-mixed, dry formulation of gypsum or Portland cement binders and light-weight mineral or synthetic aggregates mixed with water at the Project site, or provide sprayed-fiber fire-resistive material consisting of factory-mixed, dry formulation of inorganic binders, mineral fibers, fillers, and additives conveyed in a dry state by pneumatic equipment and mixed with water at a spray nozzle to form a damp, as-applied product.

C103013 1.1.4 Physical Properties

a. Dry Density: 15 lb/cubic foot (240 kg/cubic meter) for referenced fire-resistance design to attain the ratings indicated, per ASTM E 605.

b. Thickness: Provide minimum average thickness required for fire-resistance design indicated according to the following criteria, but not less than 0.375 inch (9 mm), per ASTM E 605:

1) Where the referenced fire-resistance design lists a thickness of 1 inch (25 mm) or greater, the minimum allowable individual thickness of sprayed fire-restive material is the design thickness minus 0.25 inch (6 mm).

2) Where the referenced fire-resistance design lists a thickness of less than 1 inch (25 mm) but more than 0.375 inch (9 mm), the minimum allowable individual thickness of sprayed fire-resistive material is the greater of 0.375 inch (9 mm) or

75 percent of the design thickness.

3) No reduction in design thickness is permitted for those fire-resistance designs whose fire-resistance ratings were established at densities of less than 15 lb/cubic foot (240 kg/cubic meter).

c. Bond Strength: 150 lb/sq. ft. (7.2 kPa) minimum per ASTM E 736.
d. Compressive Strength: 5.21 lb/sq. in. (35.9 kPa) as determined per ASTM E 761. Minimum thickness of sprayed fire-resistive material tested shall be 0.75 inch (19 mm) and minimum dry density shall be as specified, but not less than 15 lb/cubic foot (240 kg/cubic meter).
e. Corrosion Resistance: No evidence of corrosion per ASTM E 937.
f. Deflection: No cracking, spalling, or delaminating per ASTM E 759.
g. Effect of Impact on Bonding: No cracking, spalling, or delaminating per ASTM E 759.
h. Air Erosion: Maximum weight loss of 0.025 g/sq. foot (0.270 g/sq. meter) in 24 hours per ASTM E 859.
i. Fire-Test-Response Characteristics: Provide sprayed fire-resistive materials with the following surface-burning characteristics per ASTM E 84 by United Laboratories: flame-spread index of 10 or less and a smoke developed index of 0.
j. Fungal Resistance: No observed growth on specimens per ASTM G 21.

C103014 ENTRANCE FLOOR GRILLES AND MATS

Provide entrance mats at all entrances to the facility. Comply with ABA Standards for installed entrance mats and frames. Provide recessed entrance mats at building entrances with enclosed vestibule and surface applied entranceway mats or entranceway floor tiles at all other entrances. Entranceway mats and entranceway floor tile require the use of a transition edge where he mat adjoins other floor materials. Mat system shall meet ASTM D-2047 coefficient of friction requirements of minimum 0.60 for accessible routes and be structurally capable of withstanding a uniform floor load of 300 lbs/sq. ft. (14 kPa). All portions of mat system shall comply with ASTM E 648, Class I, Critical Radiant Flux, minimum 0.45 watts/m2 for flammability.

C103014 1.1 ROLL-UP MATS

Roll-up mats with tread rails spaced a maximum 2 inch (51 mm) on center and running counter to the traffic flow. Mats must allow debris to fall to sub-floor. Tread rails are connected by aluminum or vinyl hinges, with a continuous noise reducing vinyl cushion and an aluminum or vinyl edge around the perimeter. Roll-up mats shall be recessed or surface mounted and provided with tread inserts:

C103014 1.1.1 CARPET INSERTS

Carpet insert fiber shall be colorfast, solution dyed, anti-static, anti-microbial, and waterproof. Fiber shall be 100% nylon or polypropylene, minimum 30 oz. per square yard. Each carpet fiber shall be bonded to rigid ply backing to prevent fraying and supplied in continuous splice-free lengths.

C103014 1.1.2 VINYL OR RUBBER INSERTS

Vinyl or rubber inserts shall be removable and be made from recycled materials wherever possible. Inserts shall have serrated edges and textured surfaces for scraping purposes, bonded to a rigid vinyl or rubber tread insert.

C103014 1.1.3 RECESSED MAT THERMOPLASTIC FRAME PROPERTIES

Thermoplastic frame shall be colorfast and UV-resistant. Tensile strength of frame shall comply with ASTM D 638. Tensile impact of frame shall comply with ASTM D 1822. Flexural strength of frame shall comply with ASTM D 790. Shore D hardness of frame shall comply with ASTM D 2240. Rockwell R hardness of frame shall comply with ASTM D 785. Coefficient of thermal expansion of frame shall comply with ASTM D 696.

C103014 1.1.4 RECESSED MAT ALUMINUM FRAME REQUIREMENTS

Aluminum frame and rail shall comply with ASTM B 221, alloy 6063-T5. Frame shall have butted corners and be factory coated with zinc chromate or manufacturer's standard protective finish where surfaces are in contact with concrete. Provide standard mill finish, color anodized finish complying with AAMA 606.1, clear anodized finish complying with AAMA 607.1, or bronze complying with ASTM B455, alloy 385.

C103014 1.2 RECYCLED RUBBER TIRE TILES AND MATS

Recycled rubber tire tiles and mats shall be made from recycled truck, bus and aircraft tires with sidewall cords and buffed to a chenille finish. Product is bonded to woven flexible backing to form 3/8 to 7/16 inch (9.5 to 11.1 mm) thick, 12 inch (300 mm) square tiles or 12 inch (300 mm) wide rolls up to 25 feet (7.5 m) long.

C103014 1.3 SURFACE MOUNTED/LOOSE-LAY ENTRANCE MATS

Loose-lay mats shall have beveled vinyl or rubber transition edge and shall have surface of carpet or vinyl/rubber surfaces. Edges shall conform to ABA Accessibility Standards 4.5.2, for loose-lay surface applications. Mats shall be easily removed yet remain adhered to floor to prevent mat from moving as pressure from walking is applied.

C103014 1.3.1 RUBBER OR VINYL MATS

Non-slip mats minimum of 3/8 inch (9.5 mm) thick with square edges for recessed installations or beveled edges for surface applications. Mats shall be solid sheet (no perforations), perforated style or corrugated style with knob or flat base bottom surface. Provide surface texture to suite project requirements. Ensure mats are a prime quality compound free of calendaring and curing defects and resistant to weather aging and ozone in normal concentrations.

C103014 1.3.2 CARPET TYPE MATS

Nylon or polypropylene carpet bonded to 1/8 to 1/4 inch (3 to 6 mm) thick,

flexible vinyl backing minimum3/8 inch (9.5 mm) thick overall. Carpet has anti-static, anti-staining, non-raveling and anti-microbial properties.

C103014 1.10 SURFACE APPLIED ENTRANCEWAY FLOOR TILE

Applied entranceway floor tiles shall be in the form of carpet tiles, carpet tiles with vinyl or rubber scrubbing surfaces, or tiles of thermoplastic scrubbing surfaces only. Tiles shall be installed in areas where permanent mat is required but slab is not recessed to receive permanent recess mat. Tiles shall be securely installed without obvious seams, cleanable, dimensionally stable, and with maximum finished tile thickness of 1/2" above finished floor line. Carpet fibers shall 100% nylon or polypropylene, anti-static, anti-microbial, colorfast, solution dyed, mold and mildew resistant, and waterproof with minimum face weight of 30 oz/yd2. Thermoplastic only tiles shall be PVC free and UV-resistant.

C103015 ORNAMENTAL METALWORK

Building components made from ornamental metals. Ornamental stair handrails are included in B1010 EXTERIOR STAIRS and PTS C20, *Stairs*.

C103090 OTHER INTERIOR SPECIALTIES

This paragraph covers other interior specialties not described by other assembly categories listed previously.

C103090 1.1 PROJECTION SCREEN

Motorized projection screen shall be wall, ceiling, or above ceiling mounting, and shall have a 120V motor that is lubricated for life, quick reversal type, has overload protector, integral gears, and preset accessible limit switches. Screen shall be flame retardant, mildew resistant and have black masked borders. Controls shall be wall mounted with wiring concealed within the wall construction. Pull-down projection screens shall be provided in lieu of motorized projection screens as approved by the Activity, as specified in the project program.

C103090 1.2 OTHER INTERIOR SPECIALTIES

Also see PTS Sections C20 and C30 for additional interior specialties not specified here.

-- End of Section --

SECTION C20

STAIRS
09/15

C20 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

C20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and government standards that are referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

C20 1.1.1 Industry Standards and Codes

AISC American Institute of Steel Construction

C20 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, Architecture)
UFC 1-200-02	High Performance and Sustainable Buildings

C20 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory stair performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

C20 1.2.1 Field Testing for Concrete

Field Quality Control Test Reports to be submitted to DOR shall comply with ACI 301. If concrete is found to be below the strength required in the tests, Contractor shall remove and replace that concrete and all associated building components at his own expense.

C20 1.3 DESIGN SUBMITTALS

Design Submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures,*and UFC 3-101-01, *Architecture*.

C20 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specification*. In addition to the Z10 requirements the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

Stairs, handrails.

C2010 STAIR CONSTRUCTION

C201001 INTERIOR AND EXTERIOR STAIRS

Provide primed and painted steel stairs with concrete filled pans or cast-in-place concrete stairs for industrial and commercial construction. Design load shall not be less than 100 PSF (4.8 kPa) for live load, and 300 pounds (136 kg) for concentrated loads. Required means of egress stairs shall conform to NFPA 101. Provide steel guard and handrails.

C201001 1.1 STEEL STAIRS

Design shall conform to AISC S335 or AISC S342L.

C201001 1.1.1 Materials

a. Structural Carbon Steel - ASTM A 36/A 36M
b. Structural Tubing - ASTM A 500
c. Steel Pipe - ASTM A 47
d. Gratings - Gray cast iron ASTM A 48, Class 40
e. Metal plank grating, non-slip requirement, FS RR-G-1602 aluminum ASTM B 209, 6061-T6; steel ASTM A 653/ A 653M, G90.
f. Floor Plates, Patterned - ASTM A 786/A 786M, 14 gage.
g. Anchor Bolts - ASTM A 307
h. Galvanized Structural Steel - All steel exposed to the environment or direct water contact shall be galvanized in accordance with ASTM A 123 /A123M, ASTM A153/A153M, and ASTM A653/A653M, Z275 (G90) coating. Galvanize all components after fabrication in accordance with ASTM A385. Fabricate all steel components in the largest units practical using bolted connections for field assembly. Repair damage to, or voids in, galvanizing in accordance with ASTM A780, Annex A1 or Annex A3.

C201001 1.2 ALUMINUM ALLOY PRODUCTS

Conform to ASTM B 209 for sheet plate, ASTM B 221 for extrusions and ASTM B 26/B 26M or ASTM B 108 for castings. Aluminum extrusions shall be at least 1/8-inch (3.2 mm) thick and aluminum plate or sheet at least 0.050 inch (1.27 mm) thick.

C201001 1.3 FINISHES

C201001 1.3.1 Galvanizing

Hot-dip galvanizing: ASTM A 123/A123M, ASTM A 153/A 153M or ASTM A 653/A 653M, G90, as applicable.

C201001 1.3.2 Aluminum Finishes

Protect by plating, Class I anodic coatings, or 70% polyvinylidene fluoride organic coatings. See PTS Section C30 for additional coatings/finish information.

C201001 1.3.3 Safety Treads

NAAMM BG steel, Type W (welded).

C201001 1.3.4 Other Coatings

See PTS Section C30, *Interior Finishes*, for painted finishes.

C201001 1.4 CONCRETE STAIRS / STEPS

Provide interior or exterior concrete steps and stair with non-slip finish. For interior stairs, provide rubber or other finish treads. For exterior stairs, provide cast-in-place abrasive nosing. Provide steel guard and handrails as necessary. Fire stairs shall comply to NFPA 101.

C201001 1.4.1 Materials

a. Concrete - ACI 211.1, ACI 301/301M, and ACI 318/318M, with a compressive strength of 3,000 psi (20,680 kPa) or greater. Concrete Mix Design shall be suitable for the job conditions.
b. Reinforcements - Bars, fabrics, connectors, and chairs shall be galvanized.
c. Reinforcing Bars - ACI 301/301M
d. Welded Wire Fabric - ASTM A 185 or ASTM A 497
e. Cast Aluminum Safety Nosings – For exterior concrete stairs, provide safety nosings of cast aluminum with abrasive surfaces or with abrasive inserts.

C201001 1.5 WOOD STAIRS

Wood stairs may be used only for residential construction. Provide wood treads of minimum 1-1/4 inches thickness, of clear red or white oak. Risers shall be nominal one-inch finish lumber. Provide natural finish equivalent to one coat of sealer and two coats of varnish on all exposed surfaces.

C201002 FIRE ESCAPE STAIRS

Design fire escapes of the type and arrangement to conform to Fire Escape Stairs, of NFPA 101, Life Safety Code. Escape stairs shall be of steel or aluminum, conforming to the requirements of this specification section.

C201090 STAIR HANDRAILS, GUARDRAILS, AND ACCESSORIES

C201090 1.1 HANDRAILS

Design handrails in accordance with the IBC, except delete the handrail design load reduction code exceptions for residential, prisons, industrial, high hazard, and storage facilities. NAAMM PR, provide the same size rail and post. Provide series 300 stainless steel pipe collars. Factory coat all metal railings (except for ornamental metals such as brass, bronze, stainless steel, and nickel-silver) with a high performance coating in accordance with AAMA 2605, with a minimum coating thickness of 1.2 mils unless otherwise noted.

C201090 1.1.1 Steel Handrails

Provide steel handrails, including inserts in concrete, steel pipe conforming to ASTM A 53 or structural tubing conforming to ASTM A 500, Grade A or B of equivalent strength. Railings shall be hot-dip galvanized and shop painted for exterior applications and primed and shop painted for interior applications. Railing may be unpainted hot-dip galvanized in industrial areas.

C201090 1.1.2 Aluminum Handrails

Provide aluminum pipe railing conforming to ASTM B 429 or square aluminum semi-hollow tube conforming to ASTM B 221. Railings shall be coated with a high performance coating or anodized in accordance with AAMA 611, Class I.

C201090 1.1.3 Ornamental Handrails

Provide ornamental railings. Provide anchorage and fasteners as recommended by the product manufacturer. Railing system shall conform to ASTM E 985, minimum concentrated test load requirement.

C201090 1.1.4 Glass Handrails

Provide glass railings consisting of continuous 1/2-inch (13 mm) beveled tempered glass structural balusters with continuous railing cap and bottom shoe molding. Railing cap and shoe molding shall be 6063-T52 aluminum, type 304 stainless steel, brass, or bronze.

C201090 1.1.5 Wood Handrails

Wood handrails shall only be used for residential construction. Provide wood handrails of pre-finished natural hardwood. Wood shall be coated with hard acrylic finish to withstand indentations.

C201090 1.2 METAL LADDERS

C201090 1.2.1 Metal Ladders

Provide vertical ladders conforming to Section 7 of 29 CFR 1910.27.

C201090 1.2.2 Installation

Offset distance from the rungs to the finished wall surface not less than 7 inches (175 mm). Provide heavy clip angles riveted or bolted to the stringer and drilled for not less than two 1/2-inch (12 mm) diameter expansion bolts as indicated. Provide intermediate clip angles not over 48 inches (1200 mm) on center.

C201090 1.2.3 Ladder Cages

Where the height of the ladder is greater than 20 feet (6000 mm), provide a cage to conform to 29 CFR 1910.27.

a. Cage fabrication – Provide attachments for fastening bands to the side rails of ladders or directly to the structure.

-- End of Section --

SECTION C30

INTERIOR FINISHES
09/15

C30 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

All interior finish products shall be from manufacturers' standard running line offerings. Custom fabrications shall not be allowed unless otherwise noted.

C30 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

C30 1.1.1 Industry Standards And Codes

FLOOR COVERING INSTALLATION CONTRACTOR'S ASSOCIATION (FCICA)

FLOOR COVERING INSTALLATION BOARD (FCIB)

TILE COUNCIL OF NORTH AMERICA (TCNA)

C30 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, ArchitectureUFC 3-120-10, Interior Design)
UFC 1-200-02	High Performance and Sustainable Buildings

C30 1.2 QUALITY ASSURANCE

C30 1.2.1 Paint Applicatorâ€™s Qualifications

C30 1.2.1.1 SSPC QP 1 Certification

For the application of industrial coatings identified in the Project Program, all contractors and subcontractors that perform surface preparation or coating application shall be certified by the Society for Protective Coatings (formerly Steel Structures Painting Council) (SSPC) to the requirements of SSPC QP 1 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application. The painting contractors and painting subcontractors must remain so certified for the duration of the project. If a contractor's or subcontractor's certification expires, the firm will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Contracting Officer of any change in contractor certification status.

C30 1.2.2 Aircraft Maintenance Hangar and Vehicle Maintenance Flooring Installer Qualifications

The Designer of Record shall utilize UFGS Specification Section 09 67 23.15, *Fuel Resistive Resinous Flooring, 3-Coat System*to provide the required installer qualifications for the floor coating system.

C30 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory interior finish assemblies' performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

C30 1.3.1

Provide sample of textured ceiling application for DOR approval before resuming work. Sample shall be used as a reference for remaining application.

C30 1.3.2

Provide sample of multicolor paint application for DOR approval before resuming work. Sample shall be used as a reference for remaining application.

C30 1.3.3

Provide sample of terrazzo and/ or architectural cast-in-place concrete floor application for DOR approval before resuming work. Sample shall be used as a reference for remaining application.

C30 1.4 DESIGN SUBMITTALS

Design Submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures,*UFC 3-101-01, *Architecture and UFC 3-120-10, Interior Design*.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR shall edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS section Z10, General Performance Technical Specifications.

Changes shall not be made to the finishes that are submitted in the plans, specifications, and Structural Interior Design submittals and approved by the Government during the design phase unless changes are requested by the Government. In the event that revisions may be required because of unforeseen conditions such as discontinued product, the revisions must be approved by the DOR and then submitted to the Government Interior Designer for approval before substitutions can be made.

C30 1.5 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) and the NAVFAC Interior Designer shall approve the following construction submittals as a minimum:

Paint, Finish materials, Finish colors

Installation drawings for floors with carpet, tile, stone, architectural cast-in-place concrete or terrazzo to include locations and details of seams, color and material transitions, details of divider strips, control joints, and crack control solutions.

Changes shall not be made to the finishes that are submitted and approved by the Government during the design phase. In the event that revisions may be required because of unforeseen conditions such as discontinued product, the revisions must be approved by the DOR and then submitted to the Government Interior Designer for approval before substitutions can be made.

C3010 WALL FINISHES

Interior wall finishes shall be moisture and mildew resistant, easily maintained, and suitable in accordance with industry standards for the architectural surface being finished. For painted wall finishes, refer to C3040 "INTERIOR PAINTING AND SPECIAL COATINGS".

C301001 CONCRETE WALL FINISHES

C301001 1.1 SPECIAL OR ARCHITECTURAL FINISHES ON INTERIOR CONCRETE WALLS

Cast-in-place or pre-cast concrete wall finishes shall include, but are not limited to, abrasive blasted surfaces, colored surfaces, exposed aggregate,

grooved surfaces, or tooled surfaces.

C301002 PLASTER WALL FINISHES

Veneer plaster shall be gypsum plaster veneer finish on gypsum base finishes, or cement plaster veneer finish on concrete or masonry. Refer to Section C3040 for paint system and gloss level.

C301002 1.1 GYPSUM PLASTER

Provide gypsum neat plaster or high strength gypsum plaster base coat conforming to ASTM C28. High strength gypsum plaster shall have a compressive strength of not less than 2,500 psi, when tested dry in accordance with ASTM C472.

C301002 1.1.1

High strength gypsum gaging plaster finish coat shall have a compressive strength of not less that 4,500 psi when tested dry in accordance with ASTM C472.

C301002 1.1.2

Provide gypsum molding plaster for ornamental plaster in accordance with ASTM C59.

C301002 1.1.3

Provide Keene's cement finish coat conforming to ASTM C61.

C301002 1.1.4

Provide acoustical gypsum plaster finish coat conforming to ASTM E1042 Type I or II Class A, noncombustible.

C301002 1.2 CEMENT PLASTER

C301002 1.2.1

Portland cement plaster base coat in accordance with ASTM C150, gray Portland cement. Use Type I when no special characteristics are required, Type II when plaster and stucco will be exposed to moderate sulfate (alkali) action, Type III when early strength is needed as in cold weather, and Type V when high resistance to sulfate is required.

C301002 1.2.2

Portland cement plaster finish coat in accordance with ASTM C150, gray Portland cement Type I when no special characteristics are required, Type II when plaster and stucco will be exposed to moderate sulfate (alkali) action, Type III when early strength is needed as in cold weather.

C301002 1.2.3

Factory-mixed finish coat according to the manufacturer's instructions.

C301002 1.3 ACRYLIC PLASTER COATING

High Performance (impact resistant) seamless interior acrylic coating system shall be used as an interior wall finish over CMU that has been joint filled and smoothed with a water resistant manufactured recommended compound. Coating system to be mold and mildew resistant, have a minimum Barcoll Hardness Index of 38 and flame spread 15 or less per ASTM-E84 and have a minimum final film thickness of higher than 10 mils. Coating system must have been on the market and successfully used in commercial applications for a minimum of 10 years. Coating system must be applied by a manufacturer's factory trained applicator/installer.

C301003 GYPSUM WALLBOARD FINISHES

Conform to specifications, standards and requirements in accordance with Gypsum Association GA 214, GA 216 and GA 224. Provide asbestos free materials only. Provide Type X gypsum board in fire rated assemblies. Provide a foil back gypsum board when a vapor retarder is required.

C301003 1.1 REGULAR GYPSUM BOARD

ASTM C36/C36M and ASTM C1396/C1396M 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick in residential construction, and 5/8 inch (15.9 mm) thick in non-residential construction, tapered edges for exposed layers, square edges for concealed backer layers.

C301003 1.2 MOISTURE RESISTANT GYPSUM BOARD

ASTM C630/C630M, 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick in residential construction, and 5/8 inch (15.9 mm) thick in non-residential construction. Use in humid areas or spaces but not as a substrate in tiled areas where wall tile is exposed to direct moisture contact or condensation accumulation.

C301003 1.3 FOIL BACKED GYPSUM BOARD

ASTM C1396/C1396M 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick in residential construction, and 5/8 inch (15.9 mm) thick in non-residential construction, tapered edges for layers exposed to view, square edges for concealed layers. Seal joints in foil backing to other panels and adjoining materials as recommended by the panel manufacturer.

Alternative to foil backed gypsum board in Secured Areas: Field applied foil faced barrier material is an acceptable alternative for pre manufactured foil backed gypsum board. Provide a continuous composite multilayer barrier with a woven polyethylene sheet sandwiched between two sheets of solid reflective aluminum surfaces. Shielding effectiveness tested in accordance with IEEE 229/ ASTM D4935. Install barrier in accordance with manufactures instructions.

C301003 1.4 CEMENTITIOUS BACKING UNITS

Provide cementitious backer units, 1/2 inch (12 mm) thick, in accordance

with Tile Council of North America Handbook; use as a substrate for ceramic tile in wet areas that are exposed to direct moisture contact or condensation accumulation for areas including, but not limited to, tubs, shower enclosures, saunas, steam rooms, gang shower rooms, and shower drying rooms. Provide screws specifically designed for use with cement panels.

C301003 1.5 IMPACT RESISTANT GYPSUM BOARD

Reinforced gypsum panel with imbedded fiber mesh or polycarbonate resin thermoplastic backing, 5/8 inch (15.9 mm) thick, tapered edges, in accordance with Structural Failure Test; ASTM E695 or ASTM D2394 and Indentation Test; ASTM D5420 or ASTM D1037. Provide metal framing of 20-gauge minimum. Provide fasteners that meet manufacturer requirements and specifications. Impact resistant gypsum board shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, ASTM E84. Finish with a high strength plaster veneer. Refer to PTS C10 for further requirements on impact resistant wall construction.

C301003 1.6 JOINT TREATMENT

ASTM C475, Joint compound shall be specifically formulated and manufactured for use with and compatible with tape, substrate and fasteners as recommended by the manufacturer. Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Provide premanufactured joints at all structural expansion joints, crack control joints, and change of materials as recommended by the manufacturer and in accordance with GA 216.

C301003 1.7 FASTENERS

ASTM C514. Fasteners shall be compatible with each type of gypsum board material as recommended by the gypsum board manufacturer and in accordance with GA 216 and GA 224.

C301003 1.8 ACCESSORIES

ASTM C1047. Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or job decorated materials. For predecorated gypsum board provide prefinished metal or plastic trim to match predecorated gypsum board. Install as recommended by GA 214, GA 216 and GA 224.

C301003 1.9 LEVEL OF FINISH

C301003 1.9.1

Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Plenum areas above ceilings shall be finished to GA 214, Level 1. Water resistant gypsum backing board, ASTM C630/C630M, to receive ceramic tile shall be finished to GA 214, Level 2. Walls to receive a heavy-grade wall covering or have textured finish before painting shall be finished to GA 214 Level 3. Walls without wall wash lighting to receive paint (MPI Gloss Level 2), light textures, or wall coverings shall be finished to GA 214 Level 4. Unless otherwise specified, all gypsum board walls, partitions shall be finished to GA 214 Level 5.

Provide joint, fastener depression, and corner treatment. Do not use fiberglass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.

C301003 1.9.2

Wherever gypsum board is to receive eggshell (MPI Gloss Level 3), semigloss (MPI Gloss Level 5), or gloss (MPI Gloss Level 6) paint finish, finish gypsum wall surface to GA 214 Level 5.

C301003 1.9.3

Where wall wash lighting will accent the flatness of the wall and surface irregularities in gypsum board joints, provide feature edge gypsum board and two coat joint compound fillers. Provide this special joint treatment at up lighting, down lighting and horizontal lighting at the end of a passageway wall.

C301004 TILE AND TERRAZZO WALL FINISHES

C301004 1.1 CERAMIC TILE WALL SYSTEM FINISHES

Provide ceramic tile wall systems as defined in the Tile Council of North America (TCNA) handbook for ceramic tile installations suitable for the service requirements listed. Install systems in accordance with Tile Council of North America Handbook and ANSI A108/A118 series standards. Colored epoxy grout with sealer shall be provided. Coordinate with ceramic bath accessories for modularity. Include all trim pieces, caps, stops, and returns to complete installation.

C301004 1.1.1

Ceramic Mosaic Wall Tile shall be a minimum of 1/4 inch (6 mm) thick and installed from floor to ceiling, unless otherwise noted.

C301004 1.1.2

Wall tile shall be glazed, matte glazed or unglazed finish. Refer to project program for tile type, pattern, and surface texture.

C301004 1.1.3

Porcelain wall tile shall be through color, polished or unpolished. Refer to project program for tile type, pattern, and surface texture.

C301004 1.1.4

Provide wall tile color and style selections a minimum of one grade above base grade.

C301004 1.1.5

Provide Designer accent tile, accent strips and accessory ceramic tile shapes as an integral part of the ceramic wall tile system.

C301005 WALL COVERINGS

Wall coverings shall be material designed specifically for the specified use. The wallcovering shall contain a non-mercury based anti-microbial. The wallcovering shall be the type made without the use of cadmium-based stabilizers. Wallcovering shall have a Class A flame spread rating of 0-25 and smoke development rating of 0-50 when tested in accordance with ASTM E84. The wall preparation, trimming, adhesive and application shall be according to the manufacturer’s printed directions. The manufacturer shall approve the installers in writing. The material must be easily cleaned by traditional methods such as washing, wiping, or vacuuming. Primer and adhesive shall be of a type recommended by the wallcovering manufacturer and shall contain a non-mercury based anti-microbial. Adhesive shall be strippable type. Do not apply wall coverings to the interior surface of exterior walls.

C301005 1.1 VINYL WALL COVERING

C301005 1.1.1

Vinyl wallcovering shall be a vinyl coated woven or nonwoven fabric with germicidal additives and shall conform to ASTM F793, Category V Type II, 13.1 to 22 ounces (371 g to 624 g) total weight per square yard and width of 54 inches (1370 mm). Provide ASTM F793, Category VI, Type III, 22 ounces (624 g) and above to cover rough textured walls such as masonry.

C301005 1.1.2

Provide a polyvinyl fluoride film, 0.0005 inch (0.012 mm) thick or thicker shall be factory applied to the wall covering where additional resistance to staining and soiling from exposure to staining reagents or chemicals and resistance from abuse is required. The film shall be transparent (clear), medium gloss.

C301005 1.2 FABRIC WALL COVERING

C301005 1.2.1

Fabric wallcovering shall be woven material of Polyester or Polyolefin, or a combination of the two fibers with an acrylic backing. The face shall be treated with a soil repellent finish. The material must be a minimum of 48 inches (1219 mm) wide. "Tackable" wall covering shall be "self-healing" from tack penetration through the covering into the substrate. The material must be a minimum of 12 ounces (340 g) per square yard exclusive of backing. A tackable wall covering will not be required for smoother, less textured surface appearance.

C301005 1.2.2

Acoustical wallcovering shall be textured, woven or non-woven material of polyester or polyolefin, or a combination of the two fibers with an acrylic backing. The material must be a minimum of 48 inches (1219 mm) wide and a minimum of 16 ounces (454 g) per square yard. The material shall have an NRC rating of .15 on gypsum board in accordance with ASTM C423.

C301005 1.3 WALLCOVERING BORDER

Vinyl wallcovering border shall be a vinyl coated woven or nonwoven fabric with germicidal additives and shall conform to ASTM F793, Type I, 7 to 13 ounces (198 g to 368 g) or Type II, 13.1 to 22 ounces (371 g to 624 g) total weight per square yard.

C301005 1.4 SURFACE PREPARATION FOR UNEVEN WALLS

C301005 1.4.1

Wall liner shall be a non-woven polyester cellulose blend having a minimum weight of 3.7 ounces (105 g) per square yard and a total minimum thickness of 0.013 inches (0.33 mm). Wall liner shall have a Class A flame spread rating of 0-25 and smoke development rating of 0-50 when tested in accordance with ASTM E84. Use for masonry walls or walls with uneven surfaces.

C301005 1.4.2

For masonry or rough textured walls, use a veneer plaster finish to smooth the walls prior to wallcovering installation.

C301005 1.5 CORNER GUARDS

C301005 1.5.1

Corner guards shall be 3/32 inch (2.4 mm) thick and shall cover 1 inch (25 mm) each side of corner at right angles. Corner guards shall be clear polycarbonate. Use in executive areas, office areas, and wall-covered areas subject to cart traffic as a minimum.

C301005 1.5.2

Corner guards shall be 3/32 inch thick and shall cover 2-1/2 inches (64 mm) each side of corner at right angles. Corner guards shall be through color polycarbonate or rubber. Use in corridors or other high traffic areas.

If protective wall components from paragraphs C301090 – 1.5 and 1.6 are provided, corner guards shall be from the same lot and color as protective wall components.

C301005 1.6 WAINSCOT CAP

C301005 1.6.1

Wainscot cap shall be satin-finished extruded aluminum approximately 3/4 inch (19 mm) high, feathered at bottom edge, with an approximate 3/16 inch (5 mm) exposed face on top edge, and grooved to receive the covering. Adhesive to install wainscot cap shall be of a type recommended by the manufacturer of the cap.

C301005 1.6.2

Wood wainscot cap shall be 3-1/2 by 3/4 inch (89 mm by 19 mm) solid

hardwood, AWI Custom grade, with painted or stained finish. Profile shall be a molded shape.

C301006 ACOUSTICAL PANELS ADHERED TO WALLS

Acoustical wall treatment shall be acoustical panels, sound absorbing wall units, or acoustical wall systems. Acoustical panel system shall include manufacturer's standard concealed fasteners, splines, tracks, and other components necessary to complete the installation. Fire rating for the complete composite system shall be Class A, 200 or less smoke density and flame spread less than 25, when tested in accordance with ASTM E84.

C301006 1.1 ACOUSTICAL FABRIC COVERED WALL PANELS

C301006 1.1.1

Prefinished factory assembled wall panels shall consist of, seamless fabric covered fiberglass or mineral fiber core system. Perimeter edges shall be reinforced by an aluminum frame or a formulated resin edge hardener. Fabric covering shall be stretched free of wrinkles and then bonded to the edges and back or bonded directly to the panel face, edges, and back of panel a minimum distance standard with the manufacturer. Mounting shall be by manufacturer's standard concealed spline, mechanical fasteners, magnetic fasteners, hook and loop or adhesive mounting.

C301006 1.1.2

Stretched fabric wall panel system shall consist of continuous perimeter and butt seam mounting extrusions, site-fabricated and applied directly to the substrate. Facing fabric shall be stretched over core materials and attached without adhesives, nails, tacks, screws or tapes so that fabric may be removed and replaced with framework in place.

C301006 1.1.3

Fabric shall be seamless, 100% polyester or olefin or a blend of the two. Light fastness (fadeometer) shall be approximately 40 hours in accordance with AATCC 16.

C301006 1.1.3.1

Non-woven, embossed texture, or needle punched 100 percent polyester, minimum 12 ounces (340 g) per linear yard. Tear strength shall be minimum 25 pounds (11.25 kg) machine direction and minimum 40 pounds (18 kg) cross-machine direction in accordance with ASTM D1117. Tensile strength shall be minimum 50 pounds (22.5 kg) machine direction and minimum 75 pounds (34 kg) cross-machine direction in accordance with ASTM D5034.

C301006 1.1.3.2

Woven, minimum 2-ply 100 percent polyester or olefin, minimum 12 ounces (340 g) per linear yard. Tear strength shall be minimum 29 pounds (13 kg). Tensile strength shall be 150 pounds

(68 kg) minimum in accordance with ASTM D5034.

C301006 1.1.3.3

Perforated vinyl covering with fabric backing, minimum 20 ounces (567 g) per linear yard total weight.

C301006 1.2 ACOUSTICAL WALL PANELS

Aspen wood fibers bonded together with an inorganic hydraulic cement binder, formed in a continuous process under heat and pressure. Nominal overall panel thickness shall be 1 inch (25 mm). Noise Reduction Coefficient shall be not less than NRC 0.85 for Type C-40 and C-80 mounting.

C301090 OTHER WALL FINISHES

C301090 1.1 SOLID SURFACING WALL FINISHES

Solid surfacing material shall consist of 100% pure acrylic polymer, mineral fillers, and pigments. The material shall be homogenous, not coated or laminated, meeting ANSI Z124.3 and ANSI Z124.6 requirements. Superficial damage to a depth of 0.010 inch (.254 mm) shall be repairable by sanding or polishing. Provide manufacturer's full range of colors and patterns. Flammability, ASTM E84: Class I/A, flame spread 25 maximum; smoke developed 30 maximum.

C301090 1.1.1

If used in a shower, solid surfacing wall finishes shall extend from top of shower pan to a minimum of 84 inches (2130 mm) or to underside of ceiling and shall surround the shower enclosure. Wall finish shall extend from top of tub to 84 inches (2130 mm) and shall surround tub shower. If used in a kitchen, solid surfacing wall finish shall extend from top of kitchen countertop to underside of wall cabinet.

C301090 1.1.2

Provide solid surfacing with factory recommended fasteners/adhesives/caulk to complete the installation.

C301090 1.2 PLASTIC LAMINATE WALL FINISHES

Plastic laminate used for wall applications shall be commercial grade, high-pressure laminate with a #60 finish, approved for vertical applications. NEMA LD 3.

C301090 1.2.1

The kitchen wall area between the counter top backsplash and the bottom of the wall cabinet shall be plastic laminate. Laminate wall finish shall include factory recommended fasteners/adhesives/caulk to complete the installation.

C301090 1.3 DECORATIVE PANELING SYSTEM

Architectural paneling system applied to interior walls shall include

associated furring, fastening, and trim to complete the installation. Wood paneling system finish shall be factory or field applied.

C301090 1.4 WOOD TRIM AND DETAILING FINISHES

Decorative panels, chair rail, standing and running trim, shall be of AWI custom grade hardwood with a painted or stained finish. Refer to C3040 "INTERIOR PAINTING AND SPECIAL FINISHES" for finish system. Chair rail shall be a minimum of 3-1/2 inches (89 mm) high. Profile of chair rail shall be a molded shape. Wood trim shall include associated furring, fastening, adhesives and trim to complete the installation.

C301090 1.5 IMPACT RESISTANT PANEL OR WAINSCOT WALL FINISHES

The wall covering panel system, or wainscot, shall be an impact-resistant acrylic PVC sheet of a minimum 0.060 inch (1.5 mm) thickness in 4 foot by 8 foot (1219 mm by 2438 mm) sheets. The system shall be Class A (ASTM E84), UL listed, and chemical and stain resistant. It shall include all accessories, such as top caps, joint covers, and inside and outside corners, necessary for a complete installation. A full range of colors and textures shall be included. The wall panel system shall have coordinating color and pattern options for all components within the system. The wall panel system shall offer a 21 ounce (595 g) fabric backed vinyl wallcovering laminated to a 0.020 inch (.51 mm) rigid acrylic/PVC backing capped with 1 mil of protective film.

C301090 1.5.1

Impact Resistant Trim Finishes - Impact resistant chair or handrail system shall be a formed rigid PVC product. Chair or handrail shall be a minimum of 3 inches (76 mm) high and be mounted with concealed hardware. Chair or handrail system shall be chemical, stain, and bacteria resistant. Chair rail shall be UL classified, conforming to NFPA Class A fire rating and ASTM D256-90b for impact strength of 30.2 ft-lbs/inch thick.

C301090 1.6 CORNER AND WALL GUARDS

Corner and wall guards shall be high-impact formed polyvinyl chloride a minimum of 0.078 inch (2 mm) with concealed mounting hardware and end closure. If used with an impact resistant panels system, the guards shall be from the same manufacturer as the impact resistant wall panel system, chair or hand rail system and shall include all accessories necessary for a complete installation. A full range of styles, colors and textures shall be included.

C3020 FLOOR FINISHES

Refer to C3040 "INTERIOR PAINTING AND SPECIAL FINISHES" for painted floor coatings.

C3020 1.1 RESILIENT SUBFLOOR PREPARATION

Have third party independent concrete slab testing agent verify that concrete slabs comply with ASTM F710. Minimum values shall not be below the following: Concrete floor flatness shall meet minimum flatness of FF 60 when tested in accordance to ASTM E1155 - 96(2008). Concrete levelness on slab

on grade shall meet minimum levelness of FL 45 when tested in accordance with ASTM E1155 - 96(2008). This requirement does not apply to elevated concrete slabs.

C3020 1.1.1 Floor Preparation

Prior to installation of flooring materials the concrete sub-floors are to be dry, free of curing compounds, sweeping compounds, sealers, hardeners, and other materials which could interfere with bonding of adhesive. If curing compounds, sweeping compounds, bond breakers or sealers exist, they shall be completely removed by mechanical means and methods, specifically grinding and shot blasting of concrete surface as necessary. Determine adhesion and dryness characteristics by performing bond and moisture tests. Prior to building being conditioned, perform a preliminary moisture test using in situ probe relative humidity testing as specified per ASTM F 2170.

C3020 1.1.2 Testing

All pre-installation moisture testing is to be performed by a qualified independent testing agency. Perform the following test as soon as building is enclosed, watertight, and conditioned, and a minimum of two months prior to floor covering installation.

a. Moisture Testing: Perform moisture and pH tests as recommended by the flooring and adhesive manufacturers. Perform test starting on the deepest part of the concrete structure. Proceed with installation only after concrete substrates meet or exceed floor covering manufacturer's requirements. In the absence of specific guidance from the flooring manufacturer the following shall be the required minimum:

b. Perform concrete internal relative humidity testing using in situ probes in accordance with ASTM F 2170. Proceed with installation only after concrete reaches maximum 75 percent relative humidity level measurement.

C3020 1.1.3 Additional Preparation

If tested moisture levels exceed the allowable limits, shot blast the concrete subfloors to including grinding of areas not accessible to shot blasting equipment and install a 100% solids VOC free epoxy moisture and pH control system as recommended by the third party testing agent.

a. Install cement based self-leveling underlayment over epoxy moisture and pH control system to create a smooth substrate suitable for floor covering and approved by floor covering manufacturer for use with their products.

b. Correct conditions that will impair proper installation.

c. Fill cracks, joints and other irregularities in concrete with leveling compound.

d. Do not use adhesive for filling or leveling purposes.

C3020 1.1.4 Final Cleaning Prior to Flooring Finish Installation

Clean floor of oil, paint, dust, and deleterious substances. Leave floor dry and cured free of residue from existing curing or cleaning agents.

C302001 TILE FLOOR FINISHES

Provide ceramic tile floor systems as defined in the Tile Council of North America (TCNA) handbook for ceramic tile installation and materials for the service requirements listed. Provide installation and materials in accordance with ANSI A108/A118 series standards, except do not use organic adhesives. Provide manufacturer’s full range of colors and styles. Tile shall be a minimum of two grades above base grade.

Mortar shall be Portland cement, ANSI A108.1A/1B/1C/ A118.1, Latex-Portland cement, ANSI A108.5/A118.4 or Epoxy ANSI A108.6/A118.3.

Grout shall be factory sanded Portland cement, ANSI A108.10/A118.6, Latex-Portland cement, ANSI A108.10/A118.7 or Epoxy ANSI A108.6/A118.3. Provide tile joint grout sealer on white, light colored areas that are routinely exposed to water and liquid cleaning materials, entrance areas, and areas that require a high degree of stain resistance, and as required by the manufacturer. Provide chemical resistant epoxy resin for kitchens and other areas where high resistance to staining and absorption are required, ANSI A118.3.

Slip resistant tile shall have a minimum Dynamic Coefficient of Friction (wet and dry) of 0.42, ANSI A137.1-2012. Tile shall have smooth, non-slip or textured surface and a glazed or unglazed finish. Non-slip or textured surface required for tile in areas where there is excessive water or grease and oils such as kitchens, dining facilities, shower rooms, toilets, and in industrial and maintenance facilities.

C302001 1.1 CERAMIC MOSAIC UNGLAZED FLOOR TILES

Ceramic Mosaic unglazed floor tiles shall be a minimum of 1/4 inch (6 mm) thick with a maximum of 1/16 inch (1.6 mm) grout width with cushioned edge. Tile shall have less than a 0.5 percent water absorption rate, ASTM C373.

C302001 1.2 PORCELAIN FLOOR TILE

Porcelain floor tiles shall be a minimum of 5/16 inch (8 mm) thick with a maximum of 1/4 inch (6 mm) grout width with cushioned edge. Tile shall have a minimum breaking strength of 300 pounds (202 kg), ASTM C648 and a maximum absorption rate of 0.5%, ASTM C373. Tile shall be color through, impervious, unglazed or glazed finish with an unpolished, semi-polished, polished, or textured surface.

C302001 1.3 QUARRY FLOOR TILE

Quarry floor tiles shall be a minimum of 1/2 inch (12.7 mm) thick tiles with a maximum of 1/4 inch (6 mm) grout width. Tile shall have a minimum breaking strength of 350 pounds (158 kg), ASTM C648 and a maximum absorption rate of 3%, ASTM C373. Use grout release for darker pigmented grout colors. Tile shall have a maximum of 3.0 percent water absorption rate when tested in accordance with ASTM C373. Non-slip, abrasive grain or textured surface

required for tile in areas where there is excessive water or grease and oils. Tile shall consist of semi-vitreous, vitreous or clay material with smooth or textured surface and unglazed finish.

C302002 TERRAZZO FLOOR FINISHES

Refer to Project Program for special design requirements.

C302002 1.1 BONDED TERRAZZO

Provide terrazzo, bonded to concrete, consisting of a terrazzo topping over an underbed. Where structural movement is anticipated which may injure the terrazzo, use the sand cushion (floating) method. Provide cementitious terrazzo in accordance with the NTMA bonded terrazzo specification. Patterns shall have three (3) colors with (18 gauge) minimum zinc "L" divider strips.

Applicator shall be approved by the NTMA and shall have a minimum of 5 years experience in the application of the materials to be used and shall have a completed 8 successful installations within the past 2 years.

C302002 1.2 RESINOUS TERRAZZO

The resinous terrazzo flooring shall be an epoxy terrazzo. All terrazzo, auxiliary products and materials and application techniques used must be approved by National Terrazzo and Mosaic Association (NTMA) and epoxy terrazzo manufacturer, whichever is more stringent, prior to use. These requirements shall include, but are not limited to the following;

Epoxy Terrazzo Minimum Requirements:

The contractor must be a member of NTMA and shall have a minimum 10 years application experience and have completed a minimum 5 successful installations over the past five years of similar scope, complexity and minimum of 75 percent of the square footage.

No products shall contain VOC's or formaldehydes. Thickness 3/8" cast in place. Hardness: 60-85 per ASTM D-2240. Tensile Strength: 3,000 psi (min) per ASTM D-638. Compressive Strength: 10,000 psi (min) per ASTM D-695. Chemical Resistance: No deleterious effects per ASTM D-1308

Divider strips/control joints in the terrazzo shall be aluminum or brass shall occur directly above control joints in the subfloor and be a minimum 18 gauge "L" shape. A flexible crack suppression membrane (elastomeric) installed over entire floor slab surfaces, including all cracks in the subfloor. Flatness tolerance of the slab must be less than 0.25-in flatness variation over 10ft span. Fill areas with 100% epoxy solids with fine aggregates per manufacturer's recommendations for areas which do not meet the flatness tolerance mentioned above. The concrete surface shall use shot blasting only (no alternate method to be used). The concrete slab is to be tested for moisture transmission using ASTM F2170 Probe Test. Concrete slabs shall be shot-blasted and cleaned to receive epoxy terrazzo moisture vapor primer system as specified by manufacturer and NTMA, whichever is more stringent.

Maintain the ambient room and floor temperature at 60Â°F or above for a period extending 72 hours before, during and after floor installation. Concrete

to receive epoxy terrazzo shall have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted according to ASTM F2170, Probe Test (determining relative humidity in concrete slabs using in situ probes). Concrete slabs shall be shot-blasted and cleaned to receive epoxy terrazzo moisture vapor primer system as specified by manufacturer and NTMA, whichever is more stringent. The building shall be enclosed and the HVAC system operational prior to and during each day of installation, the terrazzo contractor shall verify that the dew point is at least 5Â° F (-15Â° C) less than the slab and air temperature.

Physical properties of the moisture migrating primer shall have a maximum of 0.3 perms with 100% RH. Primer shall be a material recommended by the resin manufacturer which will penetrate the pores of the substrate and bond with the topping to form a permanent monolithic bond between the substrate and the topping.

Five colors for various patterns and accents throughout the flooring area. Marble chips shall not exceed #1 size. Provide a minimum of three 6" x 6" samples for each color and type of terrazzo for review prior to purchase and two 6" lengths of each type of divider strip. Use of post-industrial recycled marble or granite terrazzo chips. When completed, the terrazzo shall show a minimum of 70% decorative aggregate chips on the surface.

The finished floor will be rinsed clean, allowed to dry and non-yellowing, slip-resistant & durable water based acrylic sealer. Confirm with user if high polish finish may be used in lieu of sealer. Coordinate with user sheen of polished finish. Use 100% epoxy solids flexible resin, tinted to match adjoining terrazzo matrix per manufacturer's specification.

For concrete slab requirements; See PTS A10-50 Slab on Grade, 1.1.1 Slab on Grade where Resinous Terrazzo Floor Finish is scheduled.

C302003 WOOD FLOORING

C302003 1.1 WOOD FLOORING SYSTEM

Wood strip flooring shall be 3/4 inch (19 mm) thick by 2-1/4 inches (57 mm) face width, kiln dried, continuous tongue and groove and of standard lengths. Beech and birch shall be second grade in accordance with NOFMA Grading Rules. Hard maple shall be second and better in accordance with MFMA-01. Red and white oak shall be select grade in accordance with NOFMA Grading Rules. Strip flooring shall be marked with the trademark of the grading agency. The strip flooring shall be NOFMA certified and installed in accordance with NOFMA publication *Installing Hardwood Flooring*. Nails shall be as recommended by strip flooring manufacturer’s recommendations. Resilient pads shall be pneumatic rubber, PVC, or polyurethane resilient mounts to fit the floor system. Moisture barrier shall be 6 mil minimum thickness polyethylene.

C302003 1.1.1

Rooms where wood flooring is to be installed shall have permanent heating and air conditioning installed and working or adequate arrangements for ventilation and temperature controls starting not

less than 3 days prior to beginning the installation of flooring and continuing throughout the remainder of the contract period.

C302003 1.1.2

Concrete slab shall be level, steel troweled to a tolerance of 1/8 inch (3 mm) plus or minus in a 10 foot (3048mm) radius. Slab surface shall be clean, dry, and approved by wood floor manufacturer prior to start of installation.

C302003 1.1.3

Unless otherwise approved, flooring shall be laid parallel to the length of the area to be floored. Strips shall be laid with close joints, snugly driven up but providing for expansion in accordance with humidity conditions expected during the life of the flooring. End joints shall be so alternated that there will be at least two boards between end joints in the same plane and at least 6 inches between end joints in adjacent boards. Space for expansion shall be left along perimeter walls and around fixed projections through the floor surface.

C302003 1.1.4

Flooring shall be sanded to a smooth, even, uniform finish without burns in accordance with the flooring manufacturer’s recommendations. The flooring shall be left clean and ready to receive the finishing materials. Refer to C3040 "INTERIOR PAINTING AND SPECIAL FINISHES" for floor finishes.

C302004 RESILIENT FLOOR FINISHES

All resilient flooring must meet or exceed applicable ABA Accessibility Standards horizontal requirements. Install each type of flooring with recommended adhesive in accordance with the manufacturers' written instructions. Installers must be approved by the manufacturer in writing and must have a minimum of 3 yrs experience for each type of flooring to be installed. Provide and store a minimum of 2% total quantity for each type flooring, color and pattern within each building for future replacement and patching. Provide manufacturers full line of color and pattern selections, including multi-color patterns. Use the resilient floor finishes as identified in the Project Program or as directed below.

C302004 1.1 RESILIENT SHEET FLOORING SYSTEMS

C302004 1.1.1

Resilient linoleum sheet flooring shall be made with natural raw materials including linseed oil, flour, and rosin or resin binders double calendared onto natural jute backing, ASTM F2034, Type I. Pattern and color shall extend throughout thickness of material. Gage shall be 0.10 inch (2.5 mm). Static load limit shall be 250 psi per ASTM F970. Seal linoleum using manufacturer's recommended sealer for commercial application. The manufacturer's technical representative shall review and approve each typical sample application on-site prior to resuming the installation and shall spot check each 1,196 square yards (1000 square meters) for quality

control. Work shall not commence on any portion of work until the manufacturer's technical representative renders approval on site. A manufacturer's five year warranty is required.

C302004 1.1.2

Resilient rubber sheet flooring shall be commercial quality, dimensionally stable, wear resistant, firm and slip resistant with integral color. The rubber sheet flooring shall be a three-layer construction consisting of a rubber wear layer, a cushioned layer, and a polyester backing. All components of the construction shall be thoroughly vulcanized to prevent delamination. The rubber sheet flooring shall conform to ASTM F1860-98 and require no wax maintenance.

C302004 1.1.3

Resilient homogeneous vinyl sheet flooring shall be commercial quality, 0.080 inch (2.0 mm) overall nominal gauge with a minimum wear layer thickness of 0.066 inch (1.6 mm) and a minimum of 6 feet (1.83 m) wide. It shall be non-layered, non-backed and include a protective urethane finish for ease of maintenance and conform to ASTM F1303, Type II Grade 1 Class A. Seams shall be recess scribed and heat welded with patterned or solid color weld rods depending on the contractor’s design intent to camouflage, blend or accent the seam lines. Resilient homogeneous vinyl sheet flooring shall require no wax maintenance.

C302004 1.1.4

Resilient heterogeneous vinyl sheet flooring shall be commercial quality, 0.080 inch (2.0 mm) overall nominal gauge with a minimum wear layer thickness of 0.066 inch (1.6 mm) and a minimum of 6 feet (1.83 m) or 12 feet (3.6 m) wide. It shall include a protective urethane finish for ease of maintenance and conform to ASTM F1303, Type I Grade 1 Class A. Seams shall be recess scribed and heat welded with patterned or solid color weld rods depending on the contractor's design intent to camouflage, blend or accent the seam lines. Resilient heterogeneous vinyl sheet flooring shall require no wax maintenance.

C302004 1.2 RESILIENT TILE FLOORING SYSTEM

C302004 1.2.1

Resilient vinyl composition tile (VCT) shall be commercial grade, asbestos free, with a nominal overall gauge of 1/8 inch (3 mm) and a wear layer thickness of 1/8 inch (3 mm) nominal. The tile shall be manufactured in accordance with ASTM F 1066, Type II, Comp. 1, Class 2, through pattern. Tile shall be finished in accordance with manufacturer’s written instructions.

C302004 1.2.2

Resilient static dissipative vinyl composition tile (SDT) shall be of commercial grade, asbestos free, with a nominal overall gauge of

1/8-inch (3 mm) and a wear layer thickness of 1/8-inch (3 mm) nominal; with an antistatic additive. The SDT tile shall conform to ASTM F1066, Class 2 through pattern. The flooring shall be installed with recommended adhesive and accessories; and finished in accordance with the manufacturer's written instructions. Use SDT floors in computer areas or areas with sensitive electronic where the Project Program requires tile.

C302004 1.2.3

Resilient solid vinyl tile/plank shall be 0.1 inch (2.5 mm) thick, with a vinyl wear layer of 0.040 inches (1.mm) and shall be planks or square tiles. It shall include a protective urethane finish for ease of maintenance and conform to ASTM E648, Type III, Class 1 and ASTM F1700, Class III. Provide vinyl flooring that is easily cleaned with off-the-shelf products. Surface finishes requiring manufacturer supplied or special order cleaning solutions are not acceptable. Vinyl flooring shall have a marble, granite, stone, terrazzo or wood grain pattern. A manufacturer's 25-year min warranty is required. Products must meet the Buy American Act and be manufactured in ISO 9001 and ISO 14001 compliant factories.

C302004 1.2.4

Resilient rubber tile shall be 100% synthetic rubber with color through, slip resistance formulation, with a minimum base thickness of 0.125 inch (3.2 mm) and a minimum stud height of 0.024 inch (0.6 mm). Rubber tile shall conform to ASTM F1344, Class I and ASTM E648, Class 1. The product shall require no wax maintenance. A manufacturer's 10-year warranty is required for a raised round or square surface profile. A manufacturer's 5-year warranty is required for other surface textures with slip resistant formulation.

C302004 1.2.5

Resilient athletic rubber tile shall be 100% synthetic heavy rubber or recycled crumb rubber tile, 3/8 inch (9 mm) thick. Rubber tile shall conform to ASTM F1344 for recycled crumb rubber tile. The product shall require no wax maintenance. A manufacturer’s 2-year warranty is required. Use rubber tile flooring in weight and exercise rooms.

C302004 1.2.6

Resilient linoleum tile shall be made with natural raw materials including linseed oil, flour, and rosin or resin binders double calendared onto synthetic jute backing, ASTM F2034, Type I. Pattern and color shall extend throughout thickness of material. Gage shall be 0.10 inch (2.5 mm). Static load limit shall be 250 psi per ASTM F970. Seal linoleum using manufacturer's recommended sealer for commercial application. The manufacturer's technical representative shall review and approve each typical sample application on-site prior to resuming the installation and shall spot check each 1,196 square yards (1000 square meters) for quality control. Work shall not commence on any portion of work until the manufacturer's technical representative renders approval on site. A manufacturer's 5-year warranty is required.

C302005 CARPETING

C302005 1.1 GENERAL

Installer(s) shall be approved by the manufacturer in writing. Carpet manufacturer shall be established and in good standing with the industry. A minimum of 5% total quantity for each color and pattern shall be provided and stored within the building for future replacement patching.

C302005 1.2 CARPET PILE FIBER

Provide one of the following:

a. 100% premium branded, yarn-dyed, Type 6.6 continuous hollow filament nylon
b. 100% premium branded, solution-dyed, Type 6 or Type 6.6 continuous hollow filament nylon
c. 100% premium branded, combination yarn dyed and solution-dyed, Type 6 or Type 6.6 continuous hollow filament nylon

C302005 1.3 CARPET BACKING REQUIREMENTS

a. Provide manufacturer's standard high performance carpet backing.
b. Moisture resistant carpet backing shall pass the 24 hour British Spill Test.
c. Moisture proof carpet backing shall pass the 10,000 Impacts Test.
d. Provide moisture resistant carpet backing with an attached urethane cushion, minimum 18 lb. density.
e. Provide moisture proof carpet backing with integral high density cushion of thermoplastic, urethane, or PVC.

C302005 1.4 CARPET PERFORMANCE CHARACTERISTICS

a. Flammability: Carpet shall meet the Critical Radiant Flux Classification of not less than 0.45 W/sq. cm. when tested in accordance with ASTM E648. Carpet shall generate less than 450 rating when tested in accordance with ASTM E662
b. Static Control: Carpet shall include a permanent static control system to control static build-up to less than 3.0 KV in accordance with AATCC-134.
c. Dimensional Stability: Carpet shall be permanently dimensionally stable with no delamination of components or any edge raveling or zippering. Edge Ravel: Minimum 1 lb. loop pile only - ASTM D-7267; Delamination: Minimum 3.5 lb. per inch of width - ASTM D-3936; Tuft Bind: Minimum 10 lb. average tuft bind for loop pile - ASTM D-1335; Tuft Bind: Minimum 8 lb. average tuft bind for (Modular Tile) loop pile - ASTM D-1335.
d. Colorfastness to Crocking: Not less than 4, wet and dry, per AATCC-165.
e. Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) per AATCC-16.
f. Antimicrobial Activity: Not less than 0.08-inch (2-mm) halo of inhibition for gram-positive bacteria; not less than 0.04-inch (1-mm) halo of inhibition for gram-negative bacteria; no fungal growth, per AATCC-174.
g. Appearance Retention: Provide carpet with a medium scale (>3"

repeat) or large scale (>6" repeat), multi-color pattern for excellent appearance retention and soil hiding characteristics. Heathered yarn without a pattern is unacceptable unless approved by the NAVFAC Interior Designer as an accent carpet.

h. Sustainability: Provide carpets with recycled fiber content, and renewable material content in the attached cushion or backing materials certified by an independent testing agency. Recycle Content of the Total Product Weight: Must be either Pre-consumer or Post-consumer content or a combination of these. Broadloom: minimum of 10%; Modular Tile: minimum of 30%.

i. Product Sustainability Certification: To achieve superior performance in multiple environmental attribute areas, carpet must have third party certification in accordance with NSF/ANSI 140 Sustainable Carpet Assessment Standard at a "Gold" level minimum. Carpet manufacturer must supply certificate as part of the procurement documentation.

j. Indoor Air Quality: Provide carpets that meet the criteria of the CRI "Green Label Plus" Indoor Air Quality Testing Program. Carpet adhesive VOC's shall be less than 50 g/L..

k. Reclamation of existing carpet to be determined with potential vendor. When carpet is replaced, submit certification documentation from the reclamation facility to the Contracting Officer.

l. Written Warranty: Lifetime commercial warranty for texture retention and edge raveling, zippering, de-lamination is required. Seam preparation and adhesives shall be recommended by the carpet manufacturer in accordance with the warranty. Contractor shall submit a copy of the manufacturer's standard warranty to the Contracting Officer within 60 days of BOD. Government shall be a beneficiary of the terms of this warranty.

m. Texture Appearance Retention Rating (TARR): The carpet should be evaluated using ASTM D-5252, Hexapod Drum Test, as the commercial carpet test procedure and TARR classification determined by ASTM D-7330. Carpet must meet TARR ratings specified below:

Space Definition	Traffic Classification	TARR Classification
Private Offices	Moderate	> 3.0 TARR
Training, Conference, etc.	Heavy	> 3.0 TARR
Open Office, Corridors, Lobbies, etc.	Severe	> 3.5 TARR

C302005 1.5 CARPET INSTALLATION

Install carpet by one of the following methods in accordance the manufacturer's recommendations and in accordance with the Carpet and Rug Institute, CRI-104, Standard for Installation Specification of Commercial Carpet, compatible with the construction, backing, and pattern characteristics of each carpet provided.

a. Direct Glue Down Carpet Installation
b. Double Glue Down Carpet and Pad Installation
c. Carpet with Attached-Cushion Installation
d. Preapplied releasable "dry" adhesive system installation.
e. Stretch-In Carpet Installation with tack strips and pad

C302006 MASONRY AND STONE FLOORING

C302006 1.1 UNIT MASONRY FLOORING SYSTEM

Unit masonry flooring system and coordinating base shall be fired red clay brick, or chemical resistant brick unit masonry flooring. Provide unit masonry flooring systems in accordance with the Brick Industry Association recommendations and the Tile Council of America *Handbook for Ceramic Tile Installation*.

C302006 1.2 STONE FLOOR AND BASE FINISHES

C302006 1.2.1

Natural Stone Flooring and coordinating base shall be of marble, granite, or travertine.

C302006 1.2.2

Aggregate Stone Tile and coordinating base shall be a composite of marble or granite.

C302006 1.2.3

Install stone floor and base in accordance with the recommendations of the Marble Institute of America, the Indiana Limestone Institute of America, Inc. the National Building Granite Quarries Association, Inc. in addition to the Tile Council of America *Handbook for Ceramic Tile Installation*as applicable to the type of stone being installed.

C302007 WALL BASE FINISHES

Provide a wall base for transition between floor and wall finish. If no other type of base is required, provide rubber or vinyl straight base at carpet installations, rubber or vinyl cove base at exposed concrete or resilient tile floors, and a base to match the floor material at hard surface tile floors, or as required in the project program.

C302007 1.1 RESILIENT WALL BASE FINISHES

C302007 1.1.1

All rubber wall base shall be 4 inch (100 mm) high and 1/8 inch (3.2 mm) thick as required unless indicated otherwise. The wall base shall include inside and outside corners and shall conform to ASTM F1861-98, Type TS. Provide wall base in rolls and not 4 foot lengths.

C302007 1.1.2

Flash-coved integral resilient sheet wall bases shall be installed

in accordance with the manufacturers' printed instructions to include a cove stick having a minimum radius of 3/4 inch (19 mm) and finished with an approved cap strip.

C302007 1.2 CARPET WALL BASE FINISHES

Carpet wall base finishes shall consist of a strip of carpet matching or contrasting adjacent carpet, 4 inch (100 mm) high, with the top edge finished with an aluminum or vinyl edge profile; or an edge binding material matching the carpet.

C302007 1.3 WOOD BASE FINISHES

Wall base shall be a minimum of 3-1/2 inches (90 mm) high and AWI custom grade hardwood molding with mitered inside and outside corners. Refer to C302008 – 1.1.2 for wood finishes.

C302007 1.4 STONE AND MARBLE BASE FINISHES

Stone and marble wall base shall coordinate with the adjacent flooring and shall be 4 inch (89 mm) and 3/4 inch (19 mm) thick.

C302007 1.5 TILE BASE FINISHES

Coordinate tile base with ceramic wall and floor tile for color, material match and modularity. Include all pre-manufactured trim pieces, special shapes, caps, stops, and returns to provide a complete installation. Provide coordinating wall, base and floor tile for curb construction at showers.

C302008 STAIR FINISHES

C302008 1.1 RESILIENT STAIR TREADS, RISERS AND LANDINGS

Refer to C302004 for resilient landing finishes. Provide rubber risers to match treads or one piece tread/risers. Provide treads with raised patterns and visually impaired nosing inserts as required.

C302008 1.2 PORCELAIN AND STONE STAIR TREADS, RISERS AND LANDINGS

Refer to C302001 and C302006 for porcelain and stone stair finishes. Provide treads with textured surfaces or raised patterns and visually impaired nosing inserts as required.

C302008 1.3 CARPETED STAIR TREADS, RISERS AND LANDINGS

Refer to C302005 for carpeted stair finishes. Provide dense padding on treads and nosings for increased appearance retention and durability.

C302009 FLOOR TOPPINGS AND TRAFFIC MEMBRANES

Assemblies include floor toppings and membrane systems.

C302009 1.1 REFLECTIVE, CHEMICAL AND SLIP RESISTANT FLOOR SYSTEMS

C302009 1.1.1 Thin Film Floor Coating

The Designer of Record shall utilize UFGS Specification Section 09 67 23.15, *Fuel Resistive Resinous Flooring, 3-Coat System*, for the project specification submittal and for test patch, surface preparation, and installation requirements. Use MPI Product #212 "Thin Film Flooring System for Aircraft Maintenance Facilities" for product specifications.

C302009 1.1.2 Dry Shake Floor Topping

System shall be a nonferrous, non-oxidizing metallic aggregate, dry-shake surface hardener system consisting of specially processed cementitious binder, plasticizer, and water-reducing admixtures, formulated and processed under the stringent quality control of the manufacturer. The hardener shall be proportioned and sealed in standard moisture resistant bags. The manufacturer shall guarantee their aggregate to be free of rust, corrosive materials, oil, petroleum, or other water-base materials when delivered. The manufacturer shall replace any material found to contain any such materials, or any other material, which is deemed unsatisfactory. The manufacturer shall provide a full-time technical representative, qualified in designing and adjusting concrete mixes, to assist in the application of the aggregate surface hardener system. A mono molecular surface evaporation retardant film, as recommended by ACI 305R and ACI 308R, shall be provided for use under drying conditions, due to high concrete or ambient temperatures, low humidity, high winds, and so forth. This includes heated interiors during cold weather, to aid in maintaining concrete moisture during the early placement stages of the plastic concrete. Retarder shall be certified by its manufacturer to be compatible with the surface hardener and shall be used in accordance with the manufacturer's recommendations. Curing and sealing materials and procedures shall be as recommended by the manufacturer of the aggregate surface hardener system and ASTM C309 or ASTM C1315. All installation shall be in accordance with manufacturer’s instructions. Coordinate the concrete mix design with the dry shake floor topping manufacturer to optimize bond of floor finish to slab. Spread topping mix with a mechanical spreader.

C302010 HARDENERS AND SEALERS

C302010 1.1 HARDENED AND SEALED CURE CONCRETE FLOORS

Harden and seal concrete floors in accordance with the finished floor manufacture requirements. Utilize other methods of concrete curing if the floor finish manufacturer does not recommend a chemical hardener or sealer. Concrete floors that can utilize a hardener-sealer and will be exposed to traffic shall receive a minimum of two coats of hardener-sealer curing agent for dust protection. These hardener-sealer-cured floors shall be finished with a curing agent that shall penetrate the concrete to permanently seal the floor against moisture and the penetration of contaminants. The curing agent shall be non-toxic, non-flammable, and non-combustible and shall be installed in accordance with the manufacturer’s printed instructions. The finished floor shall be dust-free.

C302010 1.2 COLORED CONCRETE FLOORS

Colored concrete floors shall include a colored pigment either applied as a topical dye; or a concrete topping with integral color pigment; or a dry shake pigment application, as required by the project program. Concrete floor shall be trowel applied in a pattern, or shall include grit for slip resistance.

C302011 RAISED ACCESS FLOORING

C302011 1.1 FLOORING SUPPORT SYSTEM

Design support system to allow for 360 degree clearance in laying out cable and cutouts for service to machines and so that panel and stringer together take up maximum of 2 inches (50 mm).

C302011 1.1.1 Pedestals, Shafts, and Caps

Provide pedestals of steel or aluminum, each capable of carrying 4,960 pounds (2250 kg) axial load without permanent deformation. Provide permanent factory applied corrosion resistant finish for pedestals made of ferrous materials. Provide base plate not less than 4 inch by 4 inch by 1/8 inches (100 mm by 100 mm by 3 mm) thick, welded to shaft of pedestal. Approved die-formed bases of equivalent load spreading capacity and bearing area may be provided in lieu of flat base plates. Provide shafts to support design loads. Provide Pedestal Caps designed to fit precisely over pedestal shafts and to interlock with panels and stringers to prevent tilting, rocking, or vibrating of panels when live load is applied. Provide pedestals with adjusting threads or other devices that will permit leveling of floor system with adjustment range of approximately 2 inches (50 mm). Provide lock nuts, set screws, or other locking devices to positively lock final pedestal vertical adjustments in place, independent of floor panels. Do not use self-tapping screws, snap type connections, or spring-action lock-nuts. All adhesives used shall be as recommended by the manufacturer.

C302011 1.1.2 Stringers

Fabricate from rolled or formed galvanized steel conforming to ASTM A591/A592M. Incorporate interlocking pedestal and stringers in pedestal stringer system, providing positive seating of panels to prevent tilting, rocking, or vibrating of panels when live load is applied. Provide stringers that can be added or removed after floor is in place. Fasten end of each stringer and mid-point of each four foot stringer positively to pedestal heads, using manufacturer's standard screws. Provide screws that are removable from top.

C302011 1.2 FLOOR PANELS

Provide interchangeable 24 inch by 24 inch (610 mm by 610 mm) square module panels capable of supporting design loads. Panels shall be of weight that can readily be removed and handled by one person using lifting tool furnished by access floor manufacturer. Panel finish surface to be Grade HW 120 high pressure plastic laminate conforming to NEMA LD. Use either factory attached carpet tile, factory attached - static dissipative grounded carpet tile or field installed carpet tile with seams overlapping the access floor grid panels or to transition areas where only part of the space is recessed

for access floor.

a. Aluminum Panels - ASTM B85, SC84A, die-cast or extruded construction for rooms with MRI equipment.

b. Steel Panels - Die-formed construction. Weld flat steel top sheet to one or more formed steel stiffener sheets. Provide zinc-coating conforming to ASTM A591/A591M, Class C, with manufacturer's standard corrosive resistant electrically conductive epoxy paint finish . Wood, plastic and other combustible products are prohibited.

c. Cementitious or Concrete Filled Formed Steel Panels Entirely non-combustible steel shell and cementitious or concrete fill, corrosive resistant inside and out. Seal cut edges in accordance with manufacturer's recommendations.

d. All panels to be manufactured in USA and individually labeled "Made in USA"

C302011 1.2.1 Gravity Held Factory Finished Panels with Bolted Stringer Understructure

Fasten end of each stringer and mid-point of each four foot stringer positively to pedestal heads, using manufacturer's standard screws. Provide corner lock system for all general office (bare for carpet tile) applications with screws that are removable from top.

C302011 1.3 GROUNDING

Ground access floor system for safety hazard and static suppression. Connection of access floor support system to building grounding electrodes is specified in another section of this RFP. Provide positive contact between components for safe, continuous electrical grounding of entire floor system. Total system resistance from wearing surface of floor to building grounding electrode shall be within the range of 0.5 megohms to 20,000 megohms for computer rooms, electronics offices, data centers and control rooms, 0.2 megohms to 2.0 megohms for clean rooms and laboratories.

C302011 1.4 THRESHOLD(S)

Provide interior thresholds of nonferrous materials where flooring materials or floor levels change.

C302011 1.5 RAMPS

Provide ramps of required slip resistance and slope conforming to ABA Accessibility Standards.

C302011 1.6 INSTALLATION

Install access floor system and accessories under supervision of the access flooring manufacturers authorized representative to insure rigid, firm installation free of vibration, rocking, rattle, squeaks, and other unacceptable performance. Install in accordance with the following;

a. Set pedestal in adhesive as recommended by the access flooring

manufacturer to provide full bearing of the pedestal base on the sub floor.

b. Layout floor panel installation to keep the number of cut panels at the floor perimeter at a minimum. Scribe panel assemblies at the perimeter to provide a close fir with no voids greater than 1/18" where panels abut vertical surfaces. At spaces where access floor connects to the walls provide connection detail that seals the access floor to the wall to reduce air leakage.

c. Secure grid member to pedestal heads in accordance with access floor manufacturers instructions.

d. Thoroughly clean up dust, dirt and construction debris caused by floor installation.

e. Level installed access floor to within 0.060" of true level over the entire area and within 0.10" in any 10" distance.

C3030 CEILING FINISHES

Refer to C3040 "INTERIOR PAINTING AND SPECIAL COATINGS" for painted ceiling finishes.

C303001 ACOUSTICAL CEILING TILES AND PANELS

C303001 1.1 ACOUSTICAL CEILING PANELS

All acoustical ceiling panels shall be 24 inch by 24 inch (610 mm by 610 mm), with a minimum light reflectance of .75 (except as noted), Class A, flame spread 25 or less and smoke development of 50 or less, ASTM E84. All acoustical ceiling panels shall have minimum 60% recycled content except as noted. Acoustical ceiling panels shall conform to ASTM E1264. Provide square edge except as noted.

C303001 1.1.1

For typical open office areas, conference rooms, executive offices, provide non-asbestos mineral composition acoustical ceiling panels of Type III with factory-applied standard washable painted finish or Type IV with factory-applied plastic membrane-faced vinyl, Form: 1, 2, or 3. Provide reveal edge tiles unless otherwise noted.

C303001 1.1.2

For typical humid areas such as toilets, kitchens, fitness and locker rooms, provide non-asbestos mineral or glass composition acoustical ceiling panels bonded with ceramic, moisture resistant thermo-setting resin, or other moisture resistant material with factory-applied standard washable painted finish; and recycled content: minimum of 40%.

C303001 1.1.3

For areas with very high humidity, heavy soiling, staining, impact abrasion, or limited security concerns, such as bachelor's quarters, laundry rooms, or maintenance shops, provide Type V, Steel or Type VII, aluminum faces with white baked on enamel finish, and non-asbestos mineral composition absorbent backing.

C303001 1.1.4

For areas requiring a concealed grid system, provide non-asbestos mineral composition acoustical ceiling panels of Type III with factory-applied standard washable painted finish or Type IV with factory-applied plastic membrane-faced vinyl, Form: 1, 2, or 3; Size: 12 inch by 12 inch by 5/8 inch (305 mm by 305 mm by 19 mm), Edge: for concealed grid installation.

C303001 1.1.5

Provide NRC and CAC ratings as follows:

Type of space	Minimum NRC	Minimum CAC
Open Office Areas, Auditoriums	.70	35-39
Conference Rooms, Classrooms	.60	35-39
Activity spaces, Lobbies, Corridors	.60	35-39
Executive and Private Offices	.60	35-39
Toilets	.50	35-39
Kitchens	.50	35-39
Fitness/Locker Rms	.50	35-39
All other spaces	.50	35-39

Base the tested NRC value on Mounting Type E-400 of ASTM E795.

C303002 GYPSUM WALLBOARD CEILING FINISHES

Conform to specifications, standards and requirements in accordance with Gypsum Association GA 214, GA 216 and GA 224. Provide asbestos free materials only. Provide featured edge gypsum board on all gypsum surfaces that flatness of joints will be visible, such as up-lighted ceilings, window lighted ceilings, and as recommended by the manufacturer. Provide Type X gypsum board in fire rated assemblies.

C303002 1.1 REGULAR GYPSUM BOARD

ASTM C36/C36M and ASTM C1396/C1396M, 1/2 or 5/8 inch(12.7 mm or 15.9 mm) thick, tapered edge. Provide 5/8 inch (15.9 mm) for all projects except for single family residential, which may utilize 1/2 inch (12.7 mm) if other requirements, such as sound control, are met.

C303002 1.2 MOISTURE RESISTANT GYPSUM BOARD

ASTM C630/C630M, 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick, tapered edges. Use for ceilings in humid areas. Do not use as a substrate in tiled areas where tile will be exposed to direct moisture contact or condensation accumulation. Support moisture resistant gypsum board at 12 inches (305 mm) on center. Provide 1/2 inch (12.7 mm) for single-family residential projects only. Provide 5/8 inch (15.9 mm) for all other projects.

C303002 1.3 FOIL BACKED GYPSUM BOARD

ASTM C1396/C1396M 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick in residential construction, and 5/8 inch (15.9 mm) thick in non-residential construction, tapered edges for layers exposed to view, square edges for concealed layers. Seal joints in foil backing to other panels and adjoining materials as recommended by the panel manufacturer.

Alternative to foil backed gypsum board in Secured Areas: Field applied foil faced barrier material is an acceptable alternative for pre manufactured foil backed gypsum board. Provide a continuous composite multilayer barrier with a woven polyethylene sheet sandwiched between two sheets of solid reflective aluminum surfaces. Shielding effectiveness tested in accordance with IEEE 229/ ASTM D4935. Install barrier in accordance with manufactures instructions

C303002 1.4 CEMENTITIOUS BACKING UNITS

ANSI A108.11 and ANSI A118.9, 1/2 or 5/8 inch (12.7 mm or 15.9 mm) thick; use for adhesive applied ceramic tile in wet areas (tubs, shower enclosures, saunas, steam rooms, gang shower rooms, or for shower areas with a veneer plaster finish. Support cementitious backing units at 12 inches (305 mm) on center. Provide screws specifically designed for use with cement panels.

C303002 1.5 IMPACT RESISTANT GYPSUM BOARD

Reinforced gypsum panel with imbedded fiber mesh or polycarbonate resin thermoplastic backing, 5/8 inch (15.9mm) thick, tapered edges, in accordance with Structural Failure Test; ASTM E695 or ASTM D2394 and Indentation Test; ASTM D5420 or ASTM D1037. For use whenever gypsum board partitions are allowed for barracks, training facilities, and industrial facilities. Provide metal framing of 20-gauge minimum. Provide fasteners that meet manufacturer requirements and specifications. Impact resistant gypsum board shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, ASTM E84. Finish with a high strength veneer plaster.

C303002 1.6 TEXTURED CEILING FINISH SYSTEM

Applied textured ceiling finish shall be plaster based. Refer to paragraph "C301002 – 1.1 GYPSUM PLASTER" for finish requirements.

C303002 1.7 JOINT TREATMENT

ASTM C475, Joint compound shall be specifically formulated and manufactured for use with and compatible with tape, substrate and fasteners as recommended by the manufacturer. Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Provide premanufactured joints at all structural expansion joints, crack control joints, and change of materials as recommended by the manufacturer and in accordance with GA 216.

C303002 1.8 FASTENERS

ASTM C514, Fasteners shall be compatible with each type of gypsum board material as recommended by the gypsum board manufacturer and in accordance with GA 216 and GA 224.

C303002 1.9 ACCESSORIES

ASTM C1047, Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or job decorated materials. Install as recommended by GA 214, GA 216 and GA 224.

C303002 1.10 LEVEL OF FINISH

C303002 1.10.1

Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Ceilings to receive a heavy-grade wall covering or heavy textured finish before painting shall be finished to GA 214, Level 3. Ceilings without critical lighting to receive flat paints, light textures, or wall coverings shall be finished to GA 214, Level 4. Unless otherwise specified, all gypsum board walls, partitions and ceilings shall be finished to GA 214, Level 5. Provide joint, fastener depression, and corner treatment. Do not use fiberglass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.

C303002 1.10.2

Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, or where severe, up or down lighting conditions occur, finish gypsum wall surface to GA 214 Level 5. In accordance with GA 214 Level 5, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.

C303003 PLASTER CEILING FINISHES

C303003 1.1 VENEER PLASTER CEILING FINISHES SYSTEM

Veneer plaster ceilings shall be gypsum plaster veneer finish to gypsum base finishes. Refer to Section C3040 for paint system and gloss level. Provide gypsum neat plaster, gypsum ready-mixed plaster, or high strength gypsum

plaster base coat conforming to ASTM C28. High strength gypsum plaster shall have a compressive strength of not less than 2,500 psi, when tested dry in accordance with ASTM C472.

C303004 WOOD CEILINGS

Not Used.

C303005 SUSPENSION SYSTEMS

C303005 1.1 EXPOSED SUSPENDED ACOUSTICAL CEILING GRID

Provide 24 inch by 24 inch (610 mm by 610 mm) aluminum or steel non-corroding intermediate-duty standard grid system for lay-in acoustical panels (ASTM C635). Finish shall be factory applied white baked enamel. Provide manufacturer's hold down clips for fire rated assemblies and wall or edge molding. Hang grid system as recommended by manufacturer but with no less than 0.106 inch (2.7 mm) diameter wires (ASTM A641A, A641M, Class 1), or with one by 3/16 inch (4.76 mm) galvanized steel straps conforming to ASTM A653A, A653M (for light commercial zinc coating) or ASTM A366A, A366M (with an electrodeposited zinc coating, Type RS). Use ASTM A580/A580M, composition 302 or 304, condition annealed stainless steel, 0.106 inches (2.7 mm) in diameter over high humidity areas such as commercial kitchens and pools. Install suspended grid system with acoustical sealant (ASTM C843, nonstaining and ASTM C636). Recycled content shall be a minimum of 25%.

C303005 1.2 CONCEALED SUSPENDED ACOUSTICAL CEILING GRID

Provide 12 inch by 12 inch (305 mm by 305 mm) aluminum or steel non-corroding intermediate-duty concealed grid system for lay-in acoustical panels (ASTM C635). Finish shall be factory applied white baked enamel. Provide manufacturer’s wall or edge molding. Hang grid system as recommended by manufacturer but no less than with 0.106 inch (2.7 mm) diameter wires (ASTM A641A, A641M, Class 1), or with one by 3/16 inch (4.76mm) galvanized steel straps conforming to ASTM A653A, A653M (for light commercial zinc coating) or ASTM A366A, A366M (with an electrodeposited zinc coating, Type RS). Install suspended grid system with acoustical sealant (ASTM C843, nonstaining) and in accordance with ASTM C636. Recycled content shall be a minimum of 25%.

C303005 1.3 SUSPENDED AND FURRED CEILING SYSTEMS

ASTM C841 (for lath); ASTM C645 (for GWB).

Provide steel materials for metal support systems with galvanized coating per ASTM A653/A653M, G60; aluminum coating ASTM A463/A463M, T1-25; or a 55% aluminum-zinc coating. Provide suspended ceiling framing in accordance with ASTM C754, except framing members shall be 16 inches (400mm) unless otherwise noted.

C303006 METAL STRIP CEILINGS

Not Used.

C303090 OTHER CEILING AND CEILING FINISHES

C3040 INTERIOR COATINGS AND SPECIAL FINISHES

Apply coatings directly to all non-prefinished surfaces of the interior construction. Comply with Master Painters Institute requirements for surface degradation analysis, surface preparation, paint and coating selection, paint application restrictions for substrate materials, and paint application.

C304001 GENERAL REQUIREMENTS

All paint shall be suitable in accordance with the Master Painter Institute (MPI) standards for the interior architectural surface being finished. The current MPI, "Approved Product List" as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a more current MPI "Approved Product List"; however, only one list may be used for the entire contract. All coats on a particular substrate, or a paint system, must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

Select paint systems for the project in accordance with the MPI Architectural Painting Decision Tree available on the Whole Building Design Guide. Use this interactive MPI Decision Tree website to identify applicable paint system(s) for the project. The MPI Decision Tree identifies paint systems for each interior or exterior coated surface in "Normal" or "Aggressive" environmental conditions and generally lists the applicable paint systems in descending order of performance. The paint system at the top of each substrate list generally indicates the highest performing acceptable coating system.

Choose the "Aggressive" environmental conditions in the MPI Decision Tree for exterior systems that are used in moist humid conditions, abrasive conditions, chemical exposure conditions, or within five miles proximity of the ocean or a body of water. Also use "Aggressive " environmental conditions in interior spaces that are exposed to in moist humid conditions, abrasive conditions, chemical exposure conditions, such as bathrooms, shower rooms, kitchens, chemical storage area, swimming pools, laundry, sanitary areas, commercial kitchens, industrial production areas, and hospital operating rooms provide paint systems that comply with the MPI Decision Tree "Aggressive" environmental conditions.

Comply with the following rules when determining the appropriate paint or coating system from the MPI Decision Tree:

a. Some of these paint systems are identified with a "NAVFAC Anchor". This "NAVFAC Anchor" indicates the minimum performing system that NAVFAC will accept for that substrate and environmental conditions.

b. When multiple "NAVFAC Anchors" are indicated on a certain substrate and environmental condition, provide the "NAVFAC Anchor" paint or coating system that is most appropriate for the facility use.

c. If only one MPI Decision Tree choice is available for a certain substrate and environmental condition with no indicated NAVFAC preference, provide that sole option for NAVFAC projects.

d. If the MPI Decision Tree provides multiple choices and no NAVFAC preference is denoted, refer to the Additional RFP Requirements below to determine level of performance.

e. If the MPI Decision Tree does not identify all paint system applicable to the facility, utilize the *MPI Architectural Painting, Exterior Systems Manual* to identify other appropriate paint systems for the project. Utilize the "Premium Grade" systems and comply with all limitations stated in the MPI "Approved Product List" for each paint product. Products having an MPI VOC Range E3 shall be given preferential consideration over lower VOC Ranges. Use higher performing paint systems unless the lower performing paint system can be justified based on a lifecycle cost to include surface preparation, application, disposal, environmental impact, and required recoating cycles. Only use paint products that have been tested for MPI'S "DETAILED PERFORMANCE" or "EVALUATED PERFORMANCE ". Do not use products that have only been tested for "INTENDED USE".

f. If an "Aggressive" environmental condition option is not available in the MPI Decision Tree for a certain substrate, use the "Normal" environmental condition option.

g. Refer to the Additional Exterior Paint and Coating System Requirements below for further system requirements.

Paints and coatings shall comply with Master Painters Institute Green Performance Standard GPS-1-12 which is available at the following website; http://www.specifygreen.com/EvrPerf/EnvironmentalPerformance.html . Provide Interior flat intermediate and topcoats of a maximum of 50 g/L VOC and interior non-flat intermediate and topcoats of a maximum 150 g/L VOC. Choose paints that provide performance and are environmentally friendly by using total VOC budgeting to analyze the total impact of all flat, non-flat and special purpose coatings on the project.

C304001 1.1 MPI GLOSS LEVELS

Gloss levels shall comply with the MPI system of determining gloss as defined in the Evaluation sections of the MPI Manuals. Utilize the performance characteristics of the paint gloss and sheen to categorize paint rather than manufactures' description of his product. The MPI Gloss Levels are indicated by the notation G1, G2, G3, G4, G5, G6, or G7. G1 is not used by Navy.

The MPI Decision Tree indicates a default gloss level for each paint system, however consider the appearance, anticipated conditions, and need for cleaning when choosing the correct gloss level for each coated surface of the project. Comply with the following guidance in choosing the appropriate gloss level.

a. Use G2 "Velvet-like" Flat for ceilings, residential walls away from human contact and low traffic areas.

b. Use G3 "Eggshell-like" in high traffic areas for ceilings and walls, when human contact with the wall is expected but limited, and for dark accent colors.

c. Use G5 Semigloss for walls, doors and trim for high durability and clean ability and when a surface is expected to have routine human contact.

d. Use G6 Gloss only in special situations such as piping identification or special effects.

The MPI Gloss and Sheen Standard values are measured per ASTM D523, and are as follows:

Gloss Level Number	Gloss@ 60 Degrees	Sheen@85 Degrees
Gloss Level 1(G1) – Matte or Flat	Max.5 units	Max.10 units
Gloss Level 2(G2) – "Velvet-like" Flat	Max. 10 units	10-35 units
Gloss Level 3(G3) – "Eggshell-like"	Max. 10-25 units	10-35 units
Gloss Level 4(G4) - "Satin-like"	Max. 20-35 units	Min. 35 units
Gloss Level 5(G5) - Semi-Gloss	35-70 units	
Gloss Level 6(G6) – Gloss	70-85 units	
Gloss Level 7(G7) – High Gloss	More than 85 units	

C304001 1.2 MPI SYSTEM DESIGNATIONS AND ABBREVIATIONS

The MPI coating system number in each Division is found in either the *MPI Architectural Painting Specification Manual*or the *Maintenance Repainting Manual*and defined as an interior system (INT/RIN).

a. INT designates an interior coating system for new surfaces.
b. RIN designates an interior coating system used in repainting projects or over existing coating systems.
c. DSD – the MPI short-term designation for Degree of Surface Degradation as defined in the Assessment sections in the *MPI Maintenance Repainting Manual*. Degree of Surface Degradation designates the MPI Standard for description and appearance of existing condition of surfaces to be painted. This DSD classification is used to determine the proper surface preparation necessary for painting.

C304001 1.3 SURFACE PREPARATION

Comply with the "Interior Surface Preparation" section of the *MPI Architectural Painting Specification Manual*or the "Interior Surface Preparation" section of the *MPI Maintenance Repainting Manual*. All suggestive language such as "may" or "should" are deleted from the standard and "must" or "shall" inserted in its place. Suggestive language such as "recommended" or "advisable" is deleted from the standard and "require" or 'required" inserted in its place. The results of these wording substitutions change this document to required procedures. For surface preparation, determine a MPI DSD Assessment of each surface and comply with the MPI Surface Preparation Requirements relating to the assessments. Notwithstanding MPI requirements, clean interior ferrous metal to a SSPC SP 10 level (near white) that have aggressive chemical environments (SSPC Zones 3A, 3B, 3C, 3D, and 3E) or waterfront exposure to open structures (SSPC Zones 2A or 2B). Examples of these types of facilities are indoor water training facilities, indoor swimming pools, and open or mostly open waterfront maintenance buildings/ waterfront warehouses/ canopies.

Remove dirt, splinters, loose particles, grease, oil, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. For existing buildings, use MPI *Maintenance Repainting Manual* to determine the coatings that need to be removed. Remove deteriorated or loose coatings before repainting begins. Oil and grease shall be removed prior to mechanical cleaning. Cleaning shall be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces. Exposed ferrous

metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, shall be spot-primed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

C304001 1.4 ADDITIONAL INTERIOR PAINT AND COATING SYSTEMS

In addition to the MPI Decision Tree, comply with the following paint system requirements:

C304001 1.4.1 PAVEMENT COATINGS

(1) INT 3.2 Concrete Horizontal Surfaces

Normal Environmental Conditions; Pigmented

Provide road and parking lot pavement marking in accordance with UFGS 32 17 23.00 20, *Pavement Markings.*

C304001 1.4.2 DRESSED LUMBER

Provide Pigmented systems for Composite Wood Doors (Fiberboard) and trim. Do not use Normal/ Aggressive; Clear and Normal/ Aggressive Stain finishes.

C304007 SPECIAL COATINGS TO WALLS

C304007 1.1 HIGH PERFORMANCE ARCHITECTURAL COATING (HIPAC)

HIPAC shall be a durable, organic system applied to a continuous (seamless) high-build film and cure to a hard glaze finish. They shall be resistant to continuous heat and humidity, abrasion, staining, chemicals, and biological growth. Coating shall be installed as a complete system, and as recommended by the manufacturer and have a flame spread index of not more than 25 and a smoke developed index of not more than 50 when tested in accordance with ASTM E84.

C304007 1.1.1

Two-component, epoxy-polyamide shall be chemical and corrosion-resistant, adhesive, alkali-resistant, and water-tolerant for metal, wood, concrete, masonry surfaces, and painted surfaces where high gloss or glaze type finish, extreme workability and resistance to abrasion and stains is required. Minimum dry film thickness is 3 mils for each of two coats. Furnish Gloss or Semigloss finish. Maximum volatile organic compounds (VOC) shall be 340 grams/liter.

C304007 1.1.2

Single Component, Moisture-Curing Urethane shall be a flexible, abrasion- and impact-resistant, use for floors, walls, machinery, equipment and other surfaces where good abrasion resistance, color retention, gloss retention, graffiti resistance and good resistance to acids, alkalis, solvents, strong cleaners and sanitizers, fuel and chemicals are necessary. Can also be used on concrete floors, brick

and masonry surfaces (properly conditioned), metals (properly primed), and wood (properly prepared and sealed.) Minimum dry film thickness is 3 mils for each of 3 coats. Use Type I, Aliphatic, for exterior use except for oily or resinous exterior wood surfaces. Use Type II, Aromatic, for interior use.

C304007 1.2 IMPACT RESISTANT WALL FINISHES

Provide textured acrylic architectural coating system: a seamless textured acrylic water-based coating system, having a thickness of at least 20 mils, on surfaces scheduled to receive it. System shall be composed of pure acrylic polymers, silica dioxide, ethylene dioxide and pigments. System shall have a Barcoll Hardness Index of 38.0 or greater, smoke contribution of 7.0 or less, and have water vapor permeability of 27.5 English Perms or greater when tested in accordance with ASTM E96. (MPI 42) Coating system must have been on the market and successfully used in commercial applications for a minimum of 10 years.

C304007 1.2.1 CMU Application

High Performance seamless interior acrylic coating system shall be used as an interior wall finish over CMU that has been joint-filled and smoothed with a water resistant manufactured recommended compound. Coating system to be mold and mildew resistant, flame spread 15 or less per ASTM-E84 and have a minimum final film thickness of 7 mils.

C304007 1.2.2 Gypsum Wallboard Application

High Performance seamless interior acrylic coating system shall be used as an interior wall finish over gypsum wallboard. Do not prime or seal the drywall except as specifically recommended by the texture acrylic coating manufacturer. Coating system to be mold and mildew resistant, flame spread 8.5 or less per ASTM-E84 and have a minimum final film thickness of 20 mils.

C304007 1.2.3 Installation

Finish may only be installed by factory-qualified applicators in accordance with the manufacturer's printed instructions and recommendations, to fulfill warranty requirements. All coating system components shall be products of the same manufacturer.

A minimum of one sample wall application shall be provided. Edges at door and window frames shall be feathered; hard edges are unacceptable. Upon approval of the sample wall by the project manager, the application shall serve as a standard for the remaining work.

The manufacturer's certified representative shall provide an on-site training demonstration of the application and care of the finish for the end-user's facility manager or other representatives.

-- End of Section --

SECTION D10

CONVEYING
09/15

D10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

Comply with the requirements of UFC 1-200-01, *General Building Requirements*.

D10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are **not** found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Refer to the UMRL for full reference standard title and current document date. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

D10 1.1.1 Industry Standards and Codes

Although some the following references are listed in the UMRL, they are repeated here for emphasis.

References publications in this RFP that refer to the "authority having jurisdiction" shall be interpreted to mean the "Contracting Officer."

AMERICAN GEAR MANUFACTURERS' ASSOCIATION (ANSI/AGMA)

ANSI/AGMA 6035	Design, Rating and Application of Industrial Globoidal Wormgearing

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B4.1	Preferred Limits and Fits for Cylindrical Parts

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	Minimum Design Load for Buildings and Other Structures

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME A17.1	Safety Code for Elevators and Escalators
ASME A17.2	Guide for Inspection of Elevators, Escalators and Moving Walks
ASME A18.1	Safety Standard for Platform Lifts and Stairway Chairlifts
ASME B20.1	Safety Standards for Conveyors and Related Equipment
ASME B30.10	Hooks
ASME B30.2	Safety Standard for Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A27	Mild to Medium Strength Carbon Steel Castings for General Application
ASTM A36	Structural Steel
ASTM A434	Standard Specification for Steel Bars, Alloy, Hot-Wrought or Cold-finished, Quenched and Tempered
ASTM A521	Standard Specification for Steel, Closed Impression Die Forgings for General Industrial Use.
ASTM A563	Standard Specification for Carbon and Alloy Steel Nuts (NOT in Spec TEXT)
ASTM A1023/A	Standard Specification for Stranded Carbon Steel Wire Ropes for General Purposes (NOT in Spec TEXT)
ASTM E1417	Standard Practice for Liquid Penetrant Examination (NOT in Spec TEXT)

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	Structural Welding Code Steel (NOT in Spec TEXT)

NATIONAL FIRE PROTECTION ASSOCIATION

NFPA 70	National Electric Code

RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC)

RSCS	Specification for Structural Joints Using High-Strength Bolts

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE J995	Mechanical and Material Requirements for Steel Nuts
SAE J123	Surface Discontinuities on Bolts, Screws, and Studs in Fatigue Applications

D10 1.1.2 Government Standards

NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

ITG FY13-01	Elevator DesignThis guide can be found at the following web address: http://www.wbdg.org/ccb/browse_cat.php?o=30&c=212
NAVFAC P-307	Management of Weight Handling Equipment

NAVAL SEA SYSTEMS COMMAND (NAVSEA)

T9074-AS-GIB-010/271	Requirements for Nondestructive Testing Methods.

US NATIONAL ARCHIVES AND RECORDS - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (NARA/ OSHA)

29 CFR, Part 1910.23	Guarding Floor and Wall Openings and

	Holes
29 CFR, Part 1910.27	Fixed Ladders
29 CFR, Part 1910.179	Overhead and Gantry Cranes
29 CFR, Part 1910.306	Specific Purpose Equipment and Installations

U.S. DEPARTMENT OF DEFENSE (DOD) UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(UFC 1-200-01 is a hub document that provides general building requirements and references other critical UFCs. A reference to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs listed in the document.)
UFC 1-200-02	High Performance and Sustainable Buildings

D10 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory Conveying systems performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

D10 1.2.1 Testing and Inspections for Elevators

a. Conduct all testing and inspections in the presence of both the Elevator Specialist and a NAVFAC Certified Elevator Inspector. The Elevator Inspector must complete, sign and post the results of all tests and inspection results after successful completion of inspection and testing. The Contractor is responsible for all costs involved with reinspection and retesting required to correct discrepancies discovered during testing and the subsequent retesting required, including all costs and expenses incurred by the Government Furnished Inspector.

b. Testing Materials and Instruments
Provide testing materials and instruments required for final inspection, including a current equipment calibration certification.

c. Field Tests for Elevators

In addition to the tests required by AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) A17.1 AND ASME A17.2, perform the following:

(1) Endurance Tests - Test each elevator for a period of one hour continuous run, with specified rated load in the car. Restart the one hour test period from beginning, following any

shutdown or failure. During the test run, stop car at each floor in both directions of travel for standing period of 10 seconds per floor. Meet the requirements for Rated Speed, Leveling, Temperature Rise, and Motor Amperes testing specified herein throughout the duration of the Endurance test.

(2) Speed Tests - Determine actual speed of each elevator in both directions of travel with rated load and with no load in elevator car. Minimum acceptable elevator speed is the Rated speed specified. Maximum acceptable elevator speed is 110 percent of Rated speed.

(3) Leveling Tests - Test elevator car leveling devices for landing accuracy of plus or minus 1/4-inch (6 mm) at each floor with no load in car, symmetrical load in car, and with rated load in car in both directions of travel. Car sill must be level with landing sills.

(4) Temperature Rise Tests - Determine temperature rise of elevator hoisting motor, motor-generator, exciter, and booster during full-load test run for one hour minimum. Under these conditions, maximum acceptable temperature rise shall not exceed acceptable temperature rise indicated on manufacturer's data plate. Start test only when equipment is within 9 degrees F (5 degrees C) of ambient temperature.

(5) Motor Ampere Tests - Measure and record motor amperage when motor is running and elevator is lifting at rated load and speed. Measure and record motor amperage at beginning and end of Endurance test. Test results must not exceed nameplate amperage when motor is running and elevator is lifting at rated load speed.

(6) Balance Load for Electric Elevators Tests - Perform electrical and mechanical balance load tests of car and counterweight.

(7) Automatic Shutoff Valve Tests - For hydraulic elevators, test the automatic shutoff valve twice. Once at beginning of acceptance test and again at conclusion of one-hour Endurance test to ensure consistent performance of shutoff valve, regardless of temperature of equipment and oil.

(8) Perform miscellaneous tests called for in this Section.

D10 1.2.2 Crane System and Monorail with Hoist/Trolley System Installation and Certification

Provide verification of satisfactory conveying systems performance via Inspection and Testing, as detailed in this section of the RFP. Erect and install the crane or monorail system, complete in accordance with the approved submittals and in condition to successfully perform the inspections, operational tests, and acceptance tests listed below. In addition, provide statements and certifications listed below.

a. Certification

The following certifications are required to be submitted and approved prior to acceptance load testing.

(1) Load Chain or Wire Rope - Submit wire rope or chain manufacturer's certification of minimum wire rope or load chain breaking force for each hoist.

(2) Overload Test Certificate - Submit a statement that the crane or monorail system and hoist/trolley can be periodically load tested at up to 131.25 percent of rated load.

(3) Loss of Power Test Certificate - Submit a statement that the crane or monorail system can be subjected to loss of power testing without damage (See paragraph entitled "Load Test").

(4) Hazardous Material Certificate - Submit a statement that the crane or monorail system contains no asbestos, lead paint, polychlorinated biphenyl's (PCB's), elemental mercury and that chromates have been avoided where feasible.

(5) Hook Proof Test - Submit a statement that load and suspension hooks have been proof tested and satisfy the acceptance criteria of ASME B30.10.

(6) Welding Certifications

(a) Submit a statement that all welders, welding operators, weld inspectors and welding procedures meet the requirements of AMERICAN WELDING SOCIETY (AWS) D14.1 for all work performed in manufacturing the cranes.

(b) Submit a statement that all welders, welding operators, weld inspectors, and welding procedures meet the requirements of AWS D1.1 for all field welds.

(7) Design Review by Professional Engineer - Submit a statement that non-commercial component design and any modifications to commercial products have been reviewed by a professional engineer. Indicate on the certificate, the name, state of licensure and license number of the professional engineer.

(8) Crane Runway Rail - For runway rails provided as part of this contract, submit survey data and a statement that the runway rails are in accordance with the requirements of CRANE MANUFACTURERS' ASSOCIATION OF AMERICA (CMAA) 70, Table 1.4.2-1, or MH 27.1, Figure 1, as applicable.

(9) Frequency Allocation Application - Complete the technical section of the Application for Equipment Frequency Allocation, Form DD 1494, addressing the radio equipment provided, submitted by the manufacturer of the radio control equipment being furnished under this contract.

b. Inspection and Testing

After erection, jointly inspect the crane or monorail system and

associated components to determine compliance with specifications and approved submittals with representatives of the Contracting Officer and of the end user's Weight Handling Equipment (WHE) Certifying Official. The WHE certifying official is the designated representative of the supported command empowered to designate lifting and handling equipment acceptable for use. Provide a report of the inspection indicating the crane or monorail system is considered ready for operational tests

(1) Operational Tests - After erection and inspection, test the crane or monorail system and hoist/trolley as specified herein. Test the systems in service to determine that each component operates as specified, is properly installed and adjusted, and is free from defects in material, manufacture, installation, and workmanship. Rectify all deficiencies disclosed by testing and retest the system or component under load to prove the system is operational. Furnish loads for testing, operating personnel, instruments, and all other necessary apparatus.

(2) Test Data - Record test data on appropriate test record forms suitable for retention for the life of the crane or monorail system. Record operating and startup current measurements for electrical equipment (motors) using appropriate instrumentation (i.e., clamp-on ammeters). In addition, note, investigate, and correct high temperatures or abnormal operation of any equipment or machinery. Record function speeds during each test cycle.

(3) Hook Measurement

(a) Measure hook for hook throat spread before and after load test. Establish a throat dimension base measurement by installing two tram points and measuring the distance between these tram points. Record this base dimension. Measure the distance between tram points after load test. Any twist or increase in the throat opening from the base measurement shall be cause for rejection.

(b) Hook Identification - Uniquely identify each hook and nut or eye pin (and swivel eye bar as applicable) with some type of permanent marking in order to provide positive traceability to the non-destructive test report. Mark hooks in low stress areas using low stress marking methods.

(4) Load and Suspension Hook Inspection - Non-Destructive Test (NDT) the entire hook, eye pin (and swivel eye bar as applicable) for defects. No linear indications greater than 1/16 inch (1.6 mm) is the acceptance criterion. Acceptance criteria for external hook threads may be based on the acceptance criteria in SAE standard J123. Use magnetic particle method in accordance with NAVAL SEA SYSTEMS COMMAND (NAVSEA) Technical Publication T9074-AS-GIB-010/271 for NDT. American Society for Testing and Materials (ASTM) A275 may be used with the following restrictions: DC yokes (including switchable AC/DC yokes used in the DC mode) and permanent magnet yokes shall not be used; automatic powder blowers or any other form of forced air other than from a hand-held bulb shall not be used for the application or removal of dry magnetic particles; arc strikes shall be removed; and equipment ammeters shall have an accuracy of +/- 5 percent of full

scale (equipment ammeter accuracy other than that stated is acceptable provided the MT procedure states that a magnetic field indicator is used to establish and verify adequate field strength for all aspects of the inspection). For hooks of non-magnetic material, use liquid penetrant (PT) method in accordance with ASTM E 1417 or T9074-AS-GIB-010/271 for NDT. For PT testing of hooks containing stainless steels, titanium, or nickel-based alloys, total halogens, and sulphur used in the NDT process shall be controlled as specified in T9074-AS-GIB-010/271. If NDT cannot be performed on surfaces inside small holes (e.g. hook/nut captivation roll pin holes), visually inspect those surfaces to the maximum extent practical. Perform NDT prior to load tests.

(5). Non-Destructive Test Quality Assurance Requirements.

(a) The magnetic particle inspection report shall include a letter from the performing vendor certifying that the vendor meets the requirements of ASTM E543. Provide current certification, within one year of the date the NDT was performed.

(b) In addition, include report procedures, for review, including technique sheets specific to the types, shapes, and sizes of the parts being examined (e.g., shank hook, eye hook, duplex hook, eye pin, swivel eye bar). Describe the orientation of the hook or pin to the magnetizing equipment in the procedures.

(c) Indicate review by an independent Level III examiner certified in the applicable NDT method and not an employee of the NDT vendor in the procedures.

(d) In lieu of a., b., and c. above, state in the NDT report that non-destructive testing was performed per Crosby Quality Control Procedure No. 0120, Revision 16, and Technique Sheet No. 319N, Revision 1, or Gunnebo Johnson Quality System Procedure QSP-69, Revision A.

(6) No-Load Test

(a) Hoist: Lower and raise each load hook through the hoist range. Operate at various speeds in both directions. Operate each load hook slowly the full operating lift distance into the hoist primary limit switch or stop and verify satisfactory operation of hoist, upper limit switch or stop, and lower limit switch or stop. Verify that a minimum of two wraps remain on the drum for wire rope hoists and that the load chain is slack on the dead end side for chain hoists when the lower limit switch is engaged. If the hoist is equipped with slow down limits, verify proper operation during the hook travel test. For electric or air powered hoists with primary and secondary limit switches, bypass the primary upper limit switch and check for proper operation of the backup limit switch. For electric hoists, verify all power to hoist is removed upon actuation of backup limit switch, and the keyswitch reenergizes hoist and allows operation in the down direction only. Operate the hoist at full speed in the up direction until the primary upper limit switch activates. Verify that the hoist stops prior to secondary limit switch operation. Operate the hoist at full speed in the up direction with the primary limit switch

bypassed until the secondary upper limit switch is activated. Verify that the hoist stops prior to the load block contacting any portion of the hoist frame. For hoists with two electromechanical brakes, remove power to the crane and observe the proper timing sequence in the application of the primary and secondary brake.

(b) Trolley: Operate the trolley the full length of the monorail or crane bridge rails in both directions. Check the existence of OSHA required 2 inch side and 3 inch overhead clearances during the trolley operation check. Operate at all various speeds in each direction. Verify proper trolley brake operation, if equipped. Slowly contact all trolley stops with the bumpers to verify even bumper contact and that there will be no contact between the crane and any obstruction within the crane envelope with the bumpers fully compressed. Contact the trolley stops with the bumpers at full rated speed, unpowered, and verify structural integrity and that there was no contact between the crane and any obstruction within the crane envelope with the bumpers fully compressed.

(c) Bridge (if equipped): Operate the crane assembly the full length of the crane runway in both directions. Check the existence of OSHA required 2 inch side and 3 inch overhead clearances during the bridge operation check. Operate at all available speeds in each direction. Verify proper bridge brake operation, if equipped. Slowly contact all bridge end stops with crane bumpers to verify even bumper contact and structural integrity and that there will be no contact between the crane and any obstruction within the crane envelope with the bumpers fully compressed. Contact the runway stops with the bumpers at full rated speed, unpowered, and verify structural integrity and that there was no contact between the crane and any obstruction within the crane envelope with the bumpers fully compressed.

(7) Rated Load Speed Test - Test at 100 percent (plus 0 percent minus 5) of rated capacity. If the crane is equipped with multiple trolleys that are used to achieve the rated load of the crane (e.g., two 2,000 pound trolleys which together allow for a 4,000 pound maximum capacity), then perform this bridge rated load speed test with the multiple trolleys loaded simultaneously.

(a) With the hoist loaded to rated capacity, raise and lower the load and record maximum and minimum load speeds in each direction. Also record the voltage and steady state motor amperage draw in both directions at maximum speed. Verify that the hoisting and lowering speeds are provided as specified. Verify slow speed operation (if equipped).

(b) If the capacity overload limit activates during lifting of the rated load (typical of the adjustable type), verify that the drive stops and the load can only be lowered. Bypass capacity overload device utilizing keyswitch and continue with test.

(c) With the hoist loaded to rated capacity and the load lifted a minimum distance, operate the trolley along the crane bridge, or monorail and record maximum and minimum load speeds in each direction. Also record the steady state motor amperage draw in both directions

at maximum speed. Verify that the trolley speeds are provided as specified. Further, verify that the trolley comes to a stop from maximum speed in each direction within a distance (in feet) equal to 10 percent of rated capacity high speed (in feet per minute). Verify slow speed operation (if equipped).

(d) With the hoist loaded to rated capacity and the load lifted a minimum distance, operate crane bridge (if equipped) along the crane runway and record maximum and minimum load speeds in each direction. Also record the steady state motor amperage draw in both directions at maximum speed. Verify that the bridge speeds are provided as specified. Further, verify that the crane bridge comes to a stop from maximum speed in each direction within a distance (in feet) equal to 10 percent of rated capacity high speed (in feet per minute). Verify slow speed operation (if equipped).

(e) With the hoist loaded to rated capacity and the load lifted a minimum distance, operate the swing function (if equipped) at maximum and minimum radius and record maximum and minimum load speeds in each direction. If swing function is powered, record the steady state motor amperage draw in both directions at maximum speed. Verify that the swing speeds are provided as specified. Further, verify that the boom comes to a stop and retains its position. Verify slow speed operation (if equipped).

(8) Rated Load Deflection Test - Test at 100 Percent (plus 0 percent minus 5) of rated capacity.

(a) With the unloaded trolley moved to one end of the bridge or monorail, measure the height of a point near the midpoint of a bridge crane, near the midpoint of the longest unsupported length of a monorail.

(b) With the hoist loaded to rated capacity, move the trolley to the midpoint of the bridge, midpoint of the longest unsupported length of a monorail. Repeat the measurement taken in step a. Record the difference between the measurements taken in step a. and step b.

(c) Verify that the difference recorded in step b. is less than 1/888 of the span for top running and cambered underrunning girder bridge cranes, 1/600 of the span for uncambered underrunning bridge cranes, 1/450 of the longest unsupported length for monorails. Patented track deflection may not exceed 1.25 inch regardless of span.

(d) For bridge cranes, move the unloaded bridge crane over a runway structural support, move the trolley to the opposite end of the bridge, and measure the height of a point near the midpoint of the longest unsupported length of runway. Hoist a load at rated capacity a minimum distance, move the trolley to the end of the bridge nearest the structural support, and travel the bridge to the midpoint of the longest unsupported length of runway. Repeat the measurement. Record the difference between the measurements. Verify that the difference is less than 1/450 of the unsupported span length for patented rail and underrunning runways, or 1/600 of the longest unsupported length for top running rolled shape runways. Patented track deflection may not exceed 1.25 inch regardless of span.

(9) Load Test - Test at 125 Percent (plus 5 percent minus 0) of rated capacity. If the crane is equipped with multiple hoists or trolleys that are used to achieve the rated load of the crane (e.g., two 2,000 pound trolleys which together allow for a 4,000 pound maximum capacity), then perform these tests with the multiple hoists or trolleys loaded simultaneously. During load testing, only lift the test load a minimum height as necessary to perform the specified tests.

(a) If the capacity overload limit activates during lifting of the test load (typical of the adjustable type), verify that the drive stops and the load can only be lowered. Bypass capacity overload device utilizing keyswitch and continue with test

(b) Hoist Static Test: Raise test load approximately 12 inches (300 mm) above the floor and hold for 10 minutes. Rotate load and hook 360 degrees clockwise and counter-clockwise to check bearing operation. Observe for load lowering that may occur indicating possible malfunction of hoisting components or brakes. Lower the test load to the floor until the hoist line is slack.

(c) Hoist Dynamic Test: Raise the test load using all available speeds. Lower the load back to the floor using all speeds. Visually observe smooth control and acceleration/deceleration between speeds. Stop the test load at least once while hoisting and once while lowering at highest speed and observe that the brake stops and holds the load. Repeat the above cycle for at least 15 minutes.

(d) Load Brake Test (for powered hoists equipped with mechanical load brake and single holding brake):

1. Raise test load no more than 5 feet (1.5 meters). With the hoist controller in the neutral position, release the holding brake. The load brake must hold the test load.

2. Raise test load the minimum amount to perform the following test. Again, with the holding brake in the released position, start the test load down slowly and return the controller to the neutral position as the test load lowers. The load brake must stop and hold the test load.

3. Document the method used to release the holding brake. Brake release method must be recorded to enable repeating that method during later periodic load testing by the end user. Methods of releasing the holding brake vary from hoist to hoist depending upon the design of the brake and hoist and must be specified by the crane manufacturer prior to testing.

(e) Trolley: With test load hoisted to a minimum height, operate the trolley the full distance of the monorail or crane bridge in both directions using slow speed. Verify satisfactory operation. Verify proper brake operation, if equipped.

(f) Bridge (if equipped): With test load hoisted to a minimum height and the trolley at one end of the bridge, operate the crane assembly the full length of the crane runway. Move the trolley to the opposite end of the bridge, then operate the crane assembly the full length

of the crane runway in the opposite direction. Verify satisfactory operation and that bridge trucks move without binding. Verify proper brake operation, if equipped.

(g) Loss of Power Test: Raise the test load approximately 3 feet (900 mm) and while lowering test load, disconnect main power to hoist and return the hoist controller to neutral. Load must stop. Repeat the test for the trolley, bridge and swing functions, as applicable.

c. Field Test Reports.

(1) Brake Adjustment Records. Provide a brake adjustment record for each brake on the crane or monorail system that contains the adjusted air gap, measured brake lining thickness, measured torque spring length, as well as the manufacturer provided range of acceptable measurement for each. Submit the brake adjustment records on the official form, which can be obtained from the Contracting Officer upon request.

(2) Field Test Record. Upon successful completion of all testing, submit a copy of the completed test record and all test data.

(3) After the crane has passed the acceptance test, complete a control system parameter record for the crane including all control system parameters, and explanation of their functions, and their final settings. Designate each control system parameter as either used or unused.

D10 1.3 DESIGN SUBMITTALS

Provide Design Submittals in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-101-01, *Architecture* and UFC 3-301-01, *Structural Engineering*. Provide design submittals that include the following items:

a. Elevators and Weight Handling Equipment (WHE):

(1) Drawings. Show the design of the track beam system, including weight handling equipment curves and switches, principal dimensions, details of structural connections, all component details, and electrical one-line diagrams. Show clearances between elevator and/ or crane structure and building and identify interferences. Provide weight handling equipment wheel load diagrams and hook configuration.

(2) Specification. Provide edited version(s) of the UFGS elevator and weight handling equipment specification(s) that are applicable to this project. Edit the UFGS's in accordance with restrictions of RFP Part 4 - PTS Section Z10 and refer to UFGS 01 33 10.05 20, *Design Submittal Procedures* for format and further specification requirements. Do not add or delete requirements to the UFGS for weight handling equipment unless specifically approved by Navy Crane Center. Edit UFGS for weight handling equipment only to add project specific information such as capacity and hook height. Submit the applicable UFGS as a part of the Contractor originated design submittal, DO NOT submit RFP Part 4 - D10 as part of the design submittal.

If this RFP includes a type of elevator and weight handling equipment that is not covered in this D10 PTS Section and is specified in a Prescriptive Specification located RFP Part 5, include this Prescriptive Specification in the Contractor's design submittal without modification.

(3) Catalog Cuts. Include catalog cuts in addition to the UFGS sections for all major components. Mark and highlight all catalog cuts to identify all the specific components that are applicable to the project.

D10 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

a. Construction Submittals for Vertical Transportation Equipment (VTE)

(1) Elevator Construction Submittals

In addition to the submittal requirements of ASME A17.1, provide the following submittals:

Detail drawings must include dimensioned layouts in plan and elevation showing the arrangement of elevator equipment, accessories, supporting systems, anchorage of equipment and anchorage forces from seismic, gravity, impact, etc. loads, clearances for maintenance and operation; and details on hoistway, doors and frames, operation and signal stations, controllers, motors, guide rails and brackets, and points of interface with normal power, fire alarm system, HVAC or exhaust systems, and interface with emergency power systems. Drawings shall show any revised building electrical system required to make supplied elevator system function as specified. Drawings shall contain complete wiring diagrams showing electrical connections and other details required to demonstrate sequence of operations and functions of system devices. Drawings shall include the appropriate sizing of electrical protective devices, which are frequently different from National Electrical Code standard sizes.

Submit one set of wiring diagrams in plastic or glass cover, framed and mounted in elevator machine room. Deliver other sets to Contracting Officer. Coded diagrams are not acceptable unless adequately identified.

(2) Construction Submittals for Facility Electronic Operation and Maintenance Support Information (eOMSI):

Submit final submittals for eOMSI Submittal. After approval by the DOR and sign-offs by the elevator inspector, assimilate construction submittals into the OMSI manuals required under Section 01 78 24.00 20, *Facility Electronic Operation and Maintenance Support Information*.

b. Construction Submittals for Weight Handling Equipment (WHE):

(1) Drawings. Submit to DOR for approval, the construction submittal and drawings described below. After DOR approval submit to the Government for approval or surveillance as required in UFGS section 01 33 00.05 20, *Construction Submittal Procedures.* Manufacturer's catalog data will suffice

for standard commercial products. Each assembly and subassembly drawing shall include an integral Bill of Materials or shall be followed by a consecutively numbered drawing with the applicable Bill of Materials.

(a) General Arrangement Drawings. Show in plan, elevation and end view the crane or monorail system assembly and each major component, including runways for underrunning cranes to demonstrate proper interface with the facility building. Show all major features including: clearances, lifts, speeds, hook approaches (on all sides), maximum wheel loads (without impact), electrical or pneumatic power supply, and general locations of components such as: hoists, trolleys, brakes, motors, speed reducers, and control panels (including size). Indicate torque value or tightening method (e.g. turn of the nut) for bolts on the drawing. In addition, show estimated weights for major components (girders, trolleys, runway beams, control panels and end trucks) and the completely assembled crane. Provide approximate locations of center of gravity and location of lifting points for completely assembled crane and for each major component with the design drawings.

(b) Structural Drawings. Show fabrication details including all weldments, fastener joints, structural components, and list of materials for fabricated crane girders (including end stops), fabricated trolleys and fabricated end trucks on these drawings. Specify the type of structural bolted connection (i.e. slip critical, snug-tightened, or pretensioned) on the drawing.

(c) Mechanical Drawings. Show the layout of mechanical equipment on cranes and monorail systems on the drawings, in particular drive arrangements (including assembled components). On pneumatically powered cranes, show the layout of pneumatic equipment, including control panel enclosures, motors, brakes, limit switches, piping and valves on the drawings. The drawings must also include:

1. Complete schematic diagram of pneumatic systems with narrative of any special description of operation. All components shown on schematics shall have labels that correspond to the nameplates that will be on the crane. Pipe material and size shall be included.

2. Rating and types of over-pressure protective devices.

3. Complete assembly diagrams including a component material list. Show on the drawings the layout of pneumatic equipment on the crane including: motors, brakes, limit switches, conduits, and piping systems.

(d) Electrical Drawings. Show the layout of electrical equipment on cranes and monorail systems, including control panel enclosures, motors, brakes, limit switches, conduits, disconnects, and conductor systems on the drawings. The drawings must also include:

1. Complete schematic diagram with narrative of any special description of operation. All components shown on schematics must have labels that correspond to the nameplates that will be on the crane. Wiring type, size, and temperature ratings must be included on schematic diagrams. Remove all optional equipment not included in this project from the schematic diagrams.

2. Motor nameplate data (including all information called for in NATIONAL

FIRE PROTECTION ASSOCIATION (NFPA) 70, Section 430.7 (A) items 1 through 7)

3. Rating and types of over-current protective devices.

4. Complete assembly (wiring) diagrams including a component material list. Show on the drawings, the layout of electrical equipment on the crane, including control panel enclosures, motors, brakes, limit switches, conduits, and conductor systems.

5. Layout diagrams showing component placement in control panel enclosures.

(2) Product Data. Provide manufacturer's catalog data for all major components of cranes and monorail systems. Mark-up or supplement the catalog cuts with additional sheets to clearly identify the model or size, selected options, features, and/or modifications to demonstrate compliance with specification requirements. Catalog cuts which show modifications beyond the standard options and all supplemental pages must bear original signatures and dates of the equipment manufacturer's authorized representative. Clearly identify the item on the catalog cuts and each supplemental sheet to which it applies.

(a) Structural Product Data. Submit product data for Bridge End Trucks, Trolley Frame, Patented Track, Runway and Bridge Rails and Support System, and End Stops.

(b) Mechanical Product Data. Submit product data for Speed Reducers, Brakes (including electrical information), Bearings, Couplings, Load Blocks, Hoist/Trolley (if procured as a packaged unit), Hose Reels, Oilers, Pressure Regulators and Bumpers.

(c) Electrical Product Data. Submit product data for Variable Frequency Drives, Motors, Electrical Enclosures, Runway Electrification and Collectors, Limit Switches, Bridge to Trolley Electrification, Pendant or Radio Control Station, Warning and Pilot Devices, Disconnect Switches, and Fuses and Circuit breakers.

(3) Design Data. Provide calculations that demonstrate compliance with all design requirements. Design data will not be approved if their evaluation/review is dependent on data or information not previously approved. List and define all variables at the beginning of each calculation section; variables must be in accordance with required references. Include sufficient information in the design data, so that they may be approved without reference to detail (shop) drawings.

When there is one hoist on one monorail system, the monorail system rated capacity and the hoist rated capacity will be equal. When there is more than one hoist on the monorail system, the rated capacity of the monorail track beam system shall be designed equal to the sum of the two hoists rated capacities. An exception to this is that if the two hoists are separated by positive track beam stops and distance so that the track beam is strength-wise essentially two independent track beam systems.

(a) Structural Calculations. Submit calculations verifying the sizing of any track, track suspension device and additional supports, which are not

the runway or monorail system manufacturer's standard cataloged product. Include support reactions and recommended method of connecting/attaching the support. Provide calculations verifying compliance with Section 3 of CMAA No.70 or No. 74 or Section 6 of MH 27.1. In addition to Load Cases 1 and 2 of CMAA No. 70 and 74, the following load combinations are also required in the crane design calculations:

1. CMAA Case 3: Test Loads. The crane will be periodically tested up to 131.25% of rated capacity. Combined stresses for the following load combinations must be calculated to ensure structural adequacy during testing:

DL (DLFB) + TL (DLFT) + LL (1 + HLF) + IFD + SK

Test Loads (Stress Level 3). In this calculation use LL = 1.3125 x rated capacity. Do not consider the test and extraordinary loads in the fatigue analysis. Formula abbreviations correspond to principal loads as defined in CMAA #70 and 74, Section 3.3. The subscripts T and B refer to trolley and bridge, respectively.

2. CMAA Case 4: Seismic Load. Provide seismic analysis in accordance with AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) 7-05. Consider loading condition in an event while the crane is operating at rated capacity without lowering or dropping the load.

3. Calculations verifying design of runway and bridge rail stops and bumpers in accordance with the dynamic requirements of Association for Iron and Steel Technology (AIST) TR-06.

4. For cranes that operate outdoor without wind protection, calculations determining the wind speed that will cause the crane travel, trolley, and rotate functions to drive through the brake with the brakes set, and, for rail mounted or wheel mounted cranes, the wind speed that will cause the crane to slide on the rail or runway surface with the brakes set.

(b) Mechanical Calculations. Calculations verifying compliance with Section 4 of CMAA #70, regardless of crane type, for any non-commercial items.

(c) Electrical Calculations

1. Minimum required horsepower for each drive motor - Motor power rating must be based upon the formulae given in CMAA #70 regardless of crane type. For hoist motor sizing calculations, the factor "Kc" shall not be less than 1.0. For bridge and trolley drive motor sizing calculations, the factor "E" shall be the published gear reducer efficiency ratings. For the bridge drive the minimum acceleration rate must be 4 seconds and 2 seconds for simulated plugging (deceleration). For the trolley drive the minimum acceleration rate must be 3 seconds and 1.5 seconds for simulated plugging. Calculations are not required for packaged hoists, but packaged hoists must still meet acceleration and deceleration requirements.

2. Overcurrent protection.

3. Conductor sizing and Conduit fill calculations (using tables from NFPA 70, Chapter 9 or manufacturer's data sheets).

4. Protective device coordination study showing proper coordination for any overcurrent devices that have the same rating as another overcurrent device upstream

5. Transformer sizing.

6. Drive controller sizing for hoist motors.

(4) Facility Electronic Operation and Maintenance Data, Documents, and Training Information. Submit the WHE's operation and maintenance data, document, and training information to be incorporated in the UFGS 01 78 24.00 20, *Electronic Facility Operation and Maintenance Support Information*(eOMSI) submittal. Make a copy of the eOMSI submittal available at the acceptance test. Include in the eOMSI submittal a table of contents, operation instructions, preventive maintenance instructions including maintenance, training materials, and programming instructions for the adjustable frequency drives, parts information, a drawing list, design drawings, lubrication drawing supply list, catalog cuts, photographs as needed to explain maintenance or repair procedures, and calculations. Provide maintenance instructions to include recommended maintenance procedures and component manufacturer's installation and maintenance manuals and lubrication instructions. Include detailed crane operating and safety instructions in the operating instructions. Parts information must include information on purchased sub-assemblies and components, including manufacturer's original part number, and detailed drawings of contractor-designed parts. Break-out the parts information into the smallest replacement part.

(5) Provide onsite training for unique critical job skills associated with the crane or attachments

(6) Field Test Reports. Submit a copy of all Field Reports.

D1010 ELEVATORS AND LIFTS

Comply with the *ITG FY13-01 Elevator Design* for the design and construction of elevators.

D1010 1.1 QUALIFICATION OF MANUFACTURER AND INSTALLER

Provide elevator by manufacturer regularly engaged in the manufacture of elevator systems. Manufacturer must either install elevator system or provide letter of endorsement certifying that installer is acceptable to manufacturer. Installer is required to be regularly engaged in installation and maintenance of elevator systems.

If the project is located in the State of Hawaii, perform work involving the installation or repair of elevator equipment under the supervision of a person who is licensed in elevator repair in the State of Hawaii or who possesses the equivalent experience. Furnish data to the Contracting Officer for verification that the person exercising direct supervision of the work possesses such experience.

D101001 GENERAL CONSTRUCTION ITEMS

Comply with ASME A17.1 AND ASME A17.2 in their entirety, and additional requirements specified herein. Install in accordance with manufacturer's instructions, ASME A17.1, DoD ABA and DEPSECDEF Memorandum (dated October 31, 2011), and NFPA 70. Do not cut or alter Structural Members. Restore damaged or defaced work to original condition. Include recesses, cutouts, slots, holes, patching, grouting, and refinishing to accommodate installation. Use core drilling to drill new holes in concrete ensuring that no existing reinforcing is cut. Finish work to be straight, level, and plumb. During installation, protect machinery and equipment from dirt, water, or mechanical damage. At completion, clean all work, and repair any prefinished items that have been damaged during the performance of the work.

Elevators that are intended to carry personnel other than one (1) operator must be classified as a passenger elevator. Passenger elevators that are intended to carry furniture or equipment, must have an oversized cab. Refer to the Project Program for the type of elevator required.

D101001 1.1 TRAFFIC ANALYSIS

Provide a traffic analysis in accordance with criteria established by a nationally recognized elevator manufacturer's association and conduct interviews with the U ser to determine the following:

a. Passenger or Freight
b. Rated load
c. Rated speed
d. Travel length
e. Number of stops
f. Number of hoistway openings
g. Car platform, car inside, and hoistway door opening dimensions
h. Hoistway Door Types
i. Car Door type
j. For Freight Elevators, identify Class Loading Type - Class A, B, or C, to handle loads as indicated on the project program.

D101001 1.2 ELEVATOR MACHINE ROOM

Provide a machine room for every elevator. Locate the elevator machine and controller in the Elevator Machine Room.

D101002 PASSENGER ELEVATORS

D101002 1.1 HOISTWAY AND CAR EQUIPMENT

D101002 1.1.1 Car and Counterweight Guide Rails and Fastenings

Paint rail shanks with one coat of black enamel. Only T-section type guide rail is acceptable.

D101002 1.1.2 Pit Channel

Provide pit channel for anchorage of main guide rail brackets and also for anchorage of counterweight guide rail brackets and buffer for electric elevators. Each channel must span distance between guides. Fully grout both pit channels on completion of guide rail and buffer installation.

D101002 1.1.3 Pit "STOP" Switch

Provide push/pull type pit "STOP".

D101002 1.1.4 Wiring and Traveling Cables

Suspend cables by means of self-tightening webbed devices.

D101002 1.2 CAR AND LANDING DOOR EQUIPMENT

D101002 1.2.1 Infrared Curtain Unit

Provide Infrared Curtain Unit (ICU) with multiple infrared beams that protect to the full height of the door opening. Extend minimum coverage from 2 inches (50 mm) off the floor to 70 inches (1778 mm) above floor level.

D101002 1.2.2 Hoistway Entrance Frames

Provide 14 gage (1.8 mm) thick #4 brushed stainless steel door frame unless directed otherwise by Contracting Officer. Solidly grout uprights of entrance ways to height of 5 feet (1500 mm).

D101002 1.2.3 Car and Hoistway Landing Sills

Car and Hoistway Landing Sill - Provide one piece cast solid white bronze or nickel silver entrance sill. Use same material for hoistway and car entrance sills. Solidly grout under full length of sill.

D101002 1.3 IN-CAR AND LANDING FIXTURES

D101002 1.3.1 Car and Hall Buttons

Provide recessed vandal-resistant push buttons of minimum 3/4-inch (19 mm) size satin-finish stainless steel with illuminating jewel center.

D101002 1.3.2 Position and Direction Indicators

Provide position and direction indicators in car and at each landing.

D101002 1.3.3 Direction Audible Signals

Provide audible signals in car and at each landing.

D101002 1.4 CAR AND CAB EQUIPMENT

D101002 1.4.1 Roller Guides

Provide coil-spring loaded roller guide assemblies in adjustable mountings on each side of car and counterweight frames in accurate alignment at top and bottom of frames.

D101002 1.4.2 Certificate Window

Provide 4 inch (100 mm) high by 6 inch (150 mm) wide certificate window

in car operating panel for elevator inspection certificate.

D101002 1.4.3 Cab Ventilation

Provide natural and forced ventilation with two-speed fan.

D101002 1.4.4 Protection Pads and Mounting Hooks

Provide stainless-steel hooks and fire retardant protective pads for one elevator in a set.

D101002 1.4.5 Car Enclosure

Car Shell Return Panels, Entrance Columns, Cove Base, and Transom: Provide 14 gage (1.9 mm) minimum non perforated steel. Apply sound-deadening mastic on all exterior components.

Provide finishes for the elevator cab interior that are appropriate for the type of facility. Finishes shall not exceed the flame spread rates mandated by ASME A17.1.

D101002 1.4.6 Car Size

Provide at least one elevator of a size and arrangement to accommodate an ambulance stretcher in the open, horizontal position. The minimum size of the ambulance stretcher used to design the elevator must be 24 inch by 84 inch (609.6 mm by 2133.6 mm) with not less than 5 inch (127 mm) radius corners. Identify all stretcher accessible elevators with the international symbol for emergency medical services (Star of Life).

D101002 1.5 ELEVATOR CONTROLLER

D101002 1.5.1 Non-proprietary Controller

Provide micro-processor controllers from controller manufacturers who provide generic controllers that are designed to function with all or most manufacturers elevator equipment. The manufacturer of the controller shall engage solely in the manufacture and sale of controllers to the elevator industry and not engage in the elevator installation, service, or maintenance. The follow controller manufactures comply with this requirement:

a. Elevator Controls Corporation, 3525 La Grande Boulevard, Sacramento, CA 95823

b. G.A.L. Manufacturing Corporation, 50 East 153th Street, Bronx, New York 10451

c. Motion Control Engineering, Inc., 11354 Whiterock Road, Rancho Cordova, CA 95742-6522

d. Virginia Controls, Inc., 2513 Mechanicsville Turnpike, Richmond, VA 23223

e. Computerized Elevator Control Corporation (Swift), 24 Empire

Blvd., Moonachie, NJ 07074-1303

The following are required features of the generic micro-processor controllers and manufacturers training:

a. On-Board Diagnostic Panel

(1) Provide a non-proprietary micro-processor controller for each individual elevator and group controller. Provide an on-board diagnostic control and LCD display panel that allows unrestricted access to the comprehensive range of adjustable parameters necessary to perform installation, adjusting, service, maintenance, and testing of the elevator.

(2) Provide LCD displays with the capability to display, monitor, and diagnose any and all fault logs, fault history, trouble calls, and diagnostics. Provide three (3) copies of the complete manufacturer's software program, with complete software documentation, that must enable the same level of unrestricted access to all controllers of the same make and model, regardless of the installation date or location.

b. External Port - For each individual elevator and group controller, provide a USB port or an RS 232 port that allows connection to an on-site portable laptop computer. Provide the same level of unrestricted access as the on-board diagnostic panel.

c. Repair Requirements - For repair of the microprocessor control system(s), provide maintenance tools, supporting computer software, and software documentation required for complete maintenance of elevator system including diagnostics and adjustments. On-board diagnostic panels must not require recharging to maintain their memory or authorization for use. Software must not require periodic reprogramming, or reauthorization. Store programs in non-volatile memory.

d. Training - The elevator controller manufacturer must offer and conduct technical support and factory training that is available to all state licensed elevator service providers qualified to bid on navy elevator maintenance service contracts. Include in the factory training all aspects of the installation, service, and maintenance of the elevator controller.

D101002 1.6 OPERATIONAL CONTROLS

D101002 1.6.1 Independent Service

Provide exposed key-operated switch in car operating panel to enable independent service.

D101002 1.6.2 Hoistway Access Switches

Provide key-operated hoistway access switch to permit limited movement of car at terminal floors for car positioning, operative only when "INSPECTION" switch in car operating panel is in the "INSPECTION" position. Locate switch 6 feet (1800 mm) above floor level, within

12 inches (300 mm) of hoistway entrance frame or with only ferrule exposed when located in entrance frame.

D101002 1.6.3 Emergency Commandeering Service

Provide momentary pressure "ON-OFF" key switch and indicator light at all landings. Provide indicator lights that automatically illuminate during emergency service. Key must be removable only when key is in "OFF" position. Provide in accordance with ASME A17.1.

D101002 1.6.4 Keys for Elevator Key Switches

Provide minimum of twelve keys per unique cylinder used on all key switches for single elevator.

D101002 1.7 MAINTENANCE AND DIAGNOSTIC COMPONENTS

D101002 1.7.1 Maintenance and Diagnostic Tools

Provide all special tools and software necessary to service and maintain each elevator; deliver at time of final acceptance. Provide one of each tool for each elevator machine room.

D101002 1.8 ADDITIONAL REQUIREMENTS FOR HYDRAULIC ELEVATORS

D101002 1.8.1 Hydraulic System

Provide hydraulic system which operates at a maximum working pressure of less than 500 psig.

a. Scavenger Pump Unit - Provide a scavenge oil reservoir, with strainer and transfer pump. Provide a manual-reset pit flood switch to prevent pump operation if pit is flooded. Anchor pump and oil reservoir to the pit floor.
b. Pressure Piping and Accessories - Provide ASTM A 53/A 53M or ASTM A 106/A 106M, Schedule 80, black steel piping with ASME B16.9 or ASME B16.11 fittings for supply piping. Provide welded or threaded forged pipe fittings that are located between the pump control valve body and the cylinder inlet. Extend Schedule 80 piping from the pump control valve body, inside the pump unit, to the hydraulic cylinder in the hoistway. Provide dielectric union at each end of the "pump to cylinder" oil supply line. Provide hangers or supports for all piping.
c. Oil Temperature Device - Provide means to maintain oil temperature between 80 and 120 degrees F (27 and 49 degrees C) regardless of ambient temperature.

D101002 1.8.2 Cylinder-Plunger Unit

Provide a plunger of single-piece seamless steel construction. Provide threaded 1/4-inch (6 mm) bleeder valve at top of cylinder just below packing gland. Telescopic or inverted cylinder-plunger units are not acceptable. Provide cylinder with self-stabilizing mount that will support and hold cylinder plumb without the need for stabilization means at the bottom of the cylinder.

D101002 1.8.3 Automatic Shutoff Valve

Provide automatic shut-off valve in oil supply line as close to cylinder inlet as possible. Provide threaded pipe connections to the valve. Provide manual lowering feature on valve. Provide exposed adjustments of automatic shut-off valve with means of adjustment sealed by certified elevator inspector after being set to correct position and tested.

D101002 1.8.4 Well Casing

Line well with steel casing, minimum 1/4-inch (6 mm) wall with welded 1/2-inch(10 mm) steel bottom, set plumb. Install cylinder well casing plumb using spider bob method.

a. PVC Liner - Provide Schedule 80 PVC pipe liner with bottom cap and couplings; joints sealed watertight using PVC pipe manufacturer's recommended adhesive or heat welding methods. Provide liner inside diameter not less than 3-inch (76 mm) larger than elevator cylinder maximum outside diameter. Set PVC liner into well casing, centered and plumb. PVC liner may be provided as a manufacture’s applied liner or as a separate component.
b. Cylinder Installation - Install Cylinder plumb into PVC.
c. Cylinder Evacuation Tube - Provide a 3/4-inch (19 mm) PVC evacuation tube with strainer located within 6 inch (152 mm) of bottom of liner. Provide top of test tube with removable cap to exclude foreign matter.
d. Pressure Test - Test liner-cylinder assembly as a sealed unit. Provide safety relief valve set to relieve at 10 psig (69 kPag); 4.5 inch (114 mm) diameter dial pressure gage scaled for 0 to 50 psig (0 to 175 kPag) and calibrated to 0.5 percent accuracy; and an air pressure admission throttling and shutoff valve. Perform air pressure test in the presence of the Elevator Inspector. For safety, pressure test shall only be performed when liner and cylinder are fully inserted and assembled in the well casing. Perform the test from remote location outside of the elevator pit.
e. Secure cylinder/PVC liner assembly as recommended by cylinder manufacturer.
f. Seal - Seal gap between steel well casing and PVC liner with foam insert strong enough to retain and support final grouting. Provide 3000 psi (21 MPa) grout to a minimum of 4 inch (102 mm) thickness and level top of final grouting with pit floor.
g. Containment - Protect exposed portions of hydraulic elevator oil supply line that are installed below ground, including portions encapsulated in concrete, or covered by construction, with continuous Schedule 80 PVC containment.
h. Provide layout diagram, foundation support details, and foundation loads.

D101003 FREIGHT ELEVATORS

D101003 1.1 FREIGHT ELEVATOR REQUIRMENTS

Code compliance and all other general compliance items for freight elevators must be as for passenger elevators, except for such items deleted, altered

or added to by the Project Program.

D101003 1.2 ADDITIONAL REQUIREMENTS FOR FREIGHT ELEVATORS

a. Guides - In addition to ASME A17.1, for freight elevators with greater than 10,000 pound (4545 Kg) capacity, slide guides are permitted in lieu of roller guides.
b. Horizontal Buck Board Wall Protection – Provide 2-1/2 inch (63 mm) thick (minimum) x 12 inch (304 mm) high (minimum) #2 oak protection boards on all side walls of the elevator at a height to prevent damage from fork lift traffic.

D101004 WHEELCHAIR LIFT

Comply with ASME A18.1, *Safety Standard for Platform Lifts and Stairway Chairlifts*.

D101005 DUMBWAITERS

Comply with ASME A17.1, *Code for Elevators and Escalators*.

D1020 WEIGHT HANDLING EQUIPMENT

Cranes and monorail systems must be designed, fabricated, assembled, shop tested, delivered, installed, inspected, field tested, and made ready for use in accordance with these RFP requirements, the applicable UFGS specification, the reference standards, and building codes. Build the crane or monorail system to the design drawings of a registered professional engineer. This PTS section is designed to provide requirements for all of the most commonly used building cranes types. Equipment provided must meet the paragraphs entitled BASIC REQUIREMENTS FOR CRANES AND MONORAIL WITH HOIST/TROLLEYS below, requirements of paragraphs entitled OVERHEAD CRANES for the crane type provided below, requirements of paragraphs entitled HOISTS for the hoist type provided as stated below, and the applicable UFGS specification section.

D102001 BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS

D102001 1.1 SAFETY

Comply with ARCHIVES AND RECORDS (NARA/ OSHA) 29 CFR, Part 1910.179, *Overhead and Gantry Cranes*and the mandatory (shall) and advisory (should) safety requirements of ASME B30.2, B30.11, B30.16 and B30.17, as applicable depending upon crane type.

D102001 1.2 MATERIALS

Provide material free from defects and imperfections that might affect the serviceability and appearance of the finished product. Provide new and unused materials that conform to the following standards.

a. Ductile Materials. All nonâ€‘redundant components directly supporting the load must be of ductile materials. These components include, but are not limited to all hoist drive gear reducer housings, motor frames and end bells (except for C-face mounted components of packaged hoists), flanged adapters, and brake wheels and discs. For the purposes of this specification ductile is defined as having a minimum elongation of 5% in 2 inches. Furthermore, provide all

shafts, keys, gears, torque carrying coupling components, and wire rope drum of steel.

b. Structural Steel conforms to ASTM A36, A572 or A992.
c. Cast Steel conforms to ASTM A27 or ASTM A148.
d. Ductile Cast Iron conforms to ASTM A536.
e. Forged steel conforms to ASTM A668 or ASTM A521, grade as applicable.
f. Steel shafts conform to ASTM A434.
g. Aluminum castings conform to ASTM B26 or ASTM B108.
h. Welding materials for crane fabrication conform to AWS D14.1
i. Welding materials for field welds conform to AWS D1.1.

D102001 1.3 TOLERANCES

Provide tolerances in accordance with the RFP requirements and the standards referenced herein.

D102001 1.4 OPERATING ENVIRONMENT

Provide pendant or radio controlled cranes and monorail systems designed to operate on electric or pneumatic or hand power as indicated in the Project Program. Design indoor equipment for an environment with an ambient temperature range of 40 Â°F to 105 Â°F. Design outdoor equipment for an environment typical of the installation location, including protection against adverse temperature, humidity, ultraviolet radiation, wet weather, salt air, corrosive atmosphere, and include features necessary to prevent in-service or premature age related failure.

D102001 1.5 APPLICABLE DESIGN STANDARD

Design cranes and monorail systems in accordance with CMAA #70, CMAA #74, MH 27.1, 29 CFR 1910.179, 29 CFR 1910.306, paragraph (b), ASME B30.2, ASME B30.11, ASME B30.16, ASME B30.17, ASCE 7-05 and other requirements specified herein. Design packaged hoist in accordance with ASME HST. A packaged hoist is defined as a hoist where the components are mounted via c, d, or p-face flanges as opposed to base mounted. All packaged hoists must be produced by established manufacturers. Furnish and install runway electrification or air distribution system as well as runways for underhung cranes, monorails as part of this specification. Provide the hook work envelope to be the maximum practical consistent with good design.

Choose rated speed of all crane functions from the SLOW or MEDIUM speeds provided in CMAA 70 or CMAA 74 for the crane configuration and rated capacity and to agree with the Project Program stated end User requirements. Provide minimum function speeds to be 1/10 rated speeds.

D102001 1.6 COMPONENTS

A standard commercial product/assembly is defined as an item that is advertised for sale in current commercial literature and is being sold in substantial quantities on the open market in the course of normal business operations. Nominal quantities, as normally associated with models, samples, prototypes, or experimental units are not acceptable under this definition. The contractor may utilize standard commercial products/assemblies in the design of the crane provided such components meet the requirements of this specification. Component selection must be substantiated by means of manufacturer's published ratings, selection

method, or pro-rating. All components and assemblies furnished must be new and unused.

D102001 1.7 STRUCTURAL DESIGN

Structural design must conform to AISC Steel Construction Manual, CMAA No. 70, CMAA No. 74 or MH27.1 using ASTM A36, A572, A588 or A992 structural steel, 29 CFR Part 1910.179, ASME B30.2, 29 CRF Part 1910.23 and 1910.27, ASCE 7-05, and other requirements specified herein.

D102001 1.7.1 Space Envelope

Design cranes and monorail systems to operate in the space and match the runway dimensions indicated in building design drawings. Provide the maximum practical hook work envelope to be consistent with good design, but not less than indicated in the Project Program.

D102001 1.7.2 Structural Fastener Tightening

All bridge girder to end truck connection fasteners and any other fasteners critical to the structural integrity of the cranes must be installed and tightened in accordance with one of the methods in the RCSC Specification for Structural Joints using High Strength Bolts.

D102001 1.7.3 Welding

All welding procedures, nondestructive testing requirements and welder qualifications shall be in accordance with the requirements of AWS D14.1 for crane and monorail system fabrication and D1.1 for building interface welds.

D102001 1.7.4 Wheel Loads

Maximum wheel loads (without impact), as well as column loads and moments due to dead load and the rated capacity live loads, with the trolley in any position, must not cause greater shear or moment in runway girders and/or supporting structures than that produced by the design crane or monorail system load and spacing shown in the facility final design. Building designs/drawings will be provided to the contractor for planning the design, shipping and erection of components.

D102001 1.7.5 Patented Track Monorail, Runway Systems and Bridge Girders

Provide monorails, underrunning runway systems and bridge girders for underrunning hoists with patented steel track, specially designed, fabricated and heat treated in accordance with MH 27.1, minimum Duty Service Classification C.

Utilize the runway or monorail (be supported from) the structural supports indicated on the facility final design. The track system and track suspension are the sole responsibility of the runway track

supplier. However, design in accordance with the requirements of this RFP. Design and construct the suspension system to ensure no impairment of the strength of track or the structural support. Locate hanger or suspension at each track splice joint. Provide bracing to hold track sections in rigid alignment at all joints.

a. Sway Bracing - Brace track laterally and longitudinally to prevent damaging sway from loading conditions (dynamic, impact, seismic, etc).

b. Cataloged Products - If possible, provide track manufacturer's standard cataloged devices for connection of the track to the indicated supporting structures. If track manufacturer's cataloged devices are not provided for this suspension system, submit complete shop drawings and calculations for each custom suspension device for review and approval.

c. Suspension of Curves and Switches - Provide steel framing (structural supports), in addition to that indicated, as required by the track curve and switch manufacturer to support curves and switches. The additional steel framing shall be the sole responsibility of the track supplier.

D102001 1.7.6 Wind Force Countermeasures For Outdoor Cranes

Provide wind brakes for each function (e.g. travel, trolley, rotate) of outdoor operating cranes where design calculations show that the function brake(s) are not sufficient to prevent inadvertent movement during crane operation in the event of worst case anticipated wind forces. Provide a securing method for each function (e.g. travel, trolley, rotate) of cranes stowed outdoors where design calculations show that the function brake(s) and additional wind brakes are not sufficient to prevent inadvertent movement during stowed condition in the event of worst case anticipated wind forces.

D102001 1.8 MECHANICAL DESIGN

The mechanical design of the cranes must conform to minimum of CMAA 70, Class C, MH 27.1, Duty Service Classification C, ASME B30.2, ASME B30.11, ASME B30.17 and other requirements specified herein. All drives which are not directâ€‘connected with shafts in line must be driven through gears. Do not rely upon retaining rings for axial retention of sheave pins or bearings on pins and axles and they are permitted only on standard commercial assemblies. Do not rely on press fits for transmission of torque, except in travel drives. Cotter pins are permitted only for locking nuts to prevent loosening and for retaining pins in standard commercial brake assemblies. Conform enclosed gearing to ANSI/ AMERICAN GEAR MANUFACTURERS' ASSOCIATION (AGMA) 6013, 6034, or 6035, as permitted. Design open gearing in accordance with ANSI/AGMA 2001.

D102001 1.8.1 Design Factors

Design cranes and monorails using the following factors:

a. Compute stresses and ratings, except as modified herein, using the locked rotor torque or horsepower of the driving motor.

b. For wire rope drum and related component calculations, the line pull off the drum shall be taken as that necessary to balance rated motor torque.

c. Design the hoist drive, except the wire rope, to withstand the setting of the hoist brake(s) under a full speed lowering condition with either no-load or rated load on the hook whichever load condition represents the worst case scenario.

d. Unless otherwise specified, design or select all mechanical components, including fasteners, to provide design factors of 4.0 and 5.0 based on material yield and ultimate tensile strengths respectively at rated load. Furthermore, except where stated otherwise, those components that are subjected to momentary peak loads (due to starting, braking, or locked rotor torque) must be designed to limit the peak stresses to 0.75 of the material yield strength, except that peak compressive stresses must be limited to 0.90 of the material yield strength.

e. Design the load suspension parts of hand chain operated hoists including load chain so that the static stress calculated for the rated load do not exceed 25% of the minimum ultimate tensile strength.

f. Design shafts and axles subjected to reversing stresses for fatigue loading per CMAA #70, regardless of crane configuration. Do not consider shaft loading resulting from the setting of brakes in the fatigue evaluation.

D102001 1.8.2 Mechanical and Threaded Fasteners and Tightening

All fasteners used in securing mechanical or electrical-mechanical (i.e., brakes) components to their foundations must be tightened to accepted torque values from standard tables based on the lubricant used. The fasteners must be lubricated and not be installed "dry". Where self-locking nuts are used, the prevailing torque of the locking element must be accounted for. Nominally tighten all mechanical fasteners to 70% of the fastener yield strength, except in applications where component manufacturers prescribe specific fastener torque requirements.

Fasten all flange-mounted components and all mechanical connections subjected to calculable loads with SAE J429, Grade 5 or Grade 8 fasteners, ASTM F436 washers, and SAE J995 Grade 5 or Grade 8 nuts. Mounting fasteners from flange-mounted components, including keeper bars, may be installed into tapped holes provided that adequate thread engagement is provided to develop the full tensile strength of the fastener. Provide all nuts with a minimum of one thread pitch of the bolt protruding above the nut top surface. Size fastener connections neglecting any benefit from shear bars or dowel pins.

D102001 1.8.3 Hoist Load Chain or Wire Rope

Provide uncoated load chain. Provide uncoated wire rope that conforms to XIP or XXIP, 6x36, IWRC per ASTM 1023/A. Minimum design factor of 5 to 1 must be provided based on ratio of minimum chain or wire rope breaking force to the calculated load on the chain or wire

rope when the hoist is assumed loaded to rated capacity. Certification from hoist manufacturer of provided chain's proof test at 150% of the hoist's rated load divided by the number of chain parts supporting the load for at least 10 minutes without deformation or wire rope's breaking force must be submitted to Contracting Officer and approved prior to final acceptance of hoist. Do not paint, galvanize or coat the load chain or wire rope. Wedge sockets are not permitted as terminal fittings on wire rope. Hoisting rope dead end connections to equalizer bar (if used) or hoist frame must be by means of poured socket connections or swaged fittings installed in a manner that develops the full breaking strength of the hoisting rope. Provide forged steel sockets. Anchor hoisting rope ends on the drum by means of swaged fittings or by clamping. Clamped hoisting rope ends must be neatly and securely seized with wire. Maintain a minimum of two full wraps of rope at the dead end(s) of the drum with the block in its lowest indicated position.

D102001 1.8.4 Load Block and Hook

Construct load blocks of steel. Design the load block to preclude the wire rope from being cut, pinched, crushed, or chafed in case of two-blocking or unloading of the wire rope. Construct load blocks so that hooks and hook nuts can be removed without re-reeving the hoist. Hooks must be able to rotate freely with 131.25% of rated load and employ a thrust bearing rated at no less than 150% of the rated load. Clearly mark hoist capacity in pounds on both sides of the load blocks.

Provide single barb forged carbon steel (conforming to ASTM A668 or ASTM A521 with a material longitudinal elongation of not less than 18% and a safety factor of no less than 5:1), swivel type hook in accordance with ANSI B30.10. Proof test hooks in accordance with ANSI B30.10 for a minimum of 10 minutes without deformation. Secure hook nuts to hooks by a commercial standard removable and reusable means (tack-welding is prohibited). Size hook throat opening for users needs. Provide hook with spring loaded steel safety latch for closing the hook throat opening. Do not paint or coat the hook or hook nut. Permanently mark hook and hook nut with a unique identification number traceable to each other and to the NDT certification. Locate unique hook and nut markings to be visible when the hook and nut are assembled on the hook block. Mark in a low stress area using low stress marking methods.

D102001 1.8.5 Wire Rope Sheaves

Provide forged steel sheaves. The minimum pitch diameters of running and equalizer sheaves must be in accordance with HST-4 for packaged hoist. Do not paint contact surfaces of sheaves. Machine or grind the grooves to contour and rim toughen them to not less than 320 BHN. Sheave groove depth must be not less than 1.15 times the hoisting rope diameter. Mount all rotating sheaves on bearings.

D102001 1.8.6 Wire Rope Drum

The drum must be a one-piece steel weldment; finish-machined after all welding and stress relieving has been completed. Include in the

drum integral stub shafts or shaft hubs for through shafts as required. Design the drum such that all hoisting rope is wound in a single layer. Do not mount drums in a 3 bearing configuration. Provide drums that are grooved, with grooves that are helical and machined right and left hand. Minimum drum groove depth must be .375 x rope diameter and drum groove pitch must be 1.14 x rope diameter or rope diameter plus 1/8 inch, whichever is smaller. Provide 18 times wire rope diameter for the minimum pitch diameter of drum.

D102001 1.8.7 Gearing

Provide enclosed (gear reducer) type gearing, except that the final drive may be open gearing. Do not use shafts with three or more bearing supports. Utilize standard commercial products for gear reducers. Provide enclosed reducers with a convenient means of lubricant level indication, oil sampling and draining. Provide base mounted reducers with a ball valve for draining. Hoist gearing shall be spur, helical, or herringbone type only, except for high speed gearing which shall be helical or herringbone. Provide spur gears only on open type drum gear-pinion sets (if applicable). Travel drive gearing may be spur, helical, herringbone or spiral bevel. Shaft mounted gear reducers may be used for travel and trolley drives only. Torque arms shall be other than threaded rod type and shall be designed and installed so that no eccentric loads are imposed on them. Provide enclosed gearing that complies with ANSI/AGMA 6013, 6034, or 6035, as permitted. Design open gearing in accordance with ANSI/AGMA 2001. If the design uses a drum gear, fabricate the gear to be removable from the drum. Provide guards on all gearing not enclosed in gear cases that may constitute a hazard under normal operating conditions, and include guards with provisions for lubrication and inspection.

D102001 1.8.8 Hoist Brakes

See HOISTS, in this section for hoist brake requirements by hoist type.

D102001 1.8.9 Travel Brakes

Provide powered trolley and bridge drives with end mounted electro-mechanical or pneumatic brakes that are spring applied, electrically or air pressure released. Manual and push bridges and trolleys do not require braking. Travel brakes shall have a torque rating of at least 50 percent for indoor cranes and have a torque rating of at least 100 percent for outdoor cranes. The torque setting must be adjustable Provide brakes capable of stopping within a distance in feet equal to 10% of the rated speed in feet per minute when traveling at rated speed with rated load. Equip brakes with a manual self-return to ON brake release. Provide brake housings with easy access for wear and setting inspection.

D102001 1.8.10 Travel Drives

The bridge and trolley drives must be A-4 type.

D102001 1.8.11 Shafts, Axles, and Pins

All shafts, axles, and pins must be steel. Top running bridge and

trolley axles must be of the rotating type.

D102001 1.8.12 Wheels

Underrunning wheels shall be flanged. Provide double flanged for top running bridge and trolley wheels. All wheels shall be straight tread and rolled to shape or roll forged to provide properties in congruence with ASTM A504. Do not make wheels by casting, fabrication from plate steel or hollow stamping. Rim toughen wheels that run on standard runway rails to not less than 320 BHN. Heat treat wheels that run on patented track beam to have minimum tread hardness of 375 BHN. Design bridge and trolley wheels to be compatible with their respective runway's profile. Provide wheel sizing and flange-to-rail head clearances in accordance with MH 27.1 and CMAA recommendations.

Equip bridge and trolley wheels of top running cranes and trolleys with rail sweeps. Provide a means to prevent bridge end truck and trolley from dropping more than one inch in case of wheel or axle failure.

D102001 1.8.13 Bumpers

Provide bumpers of the elastomeric, hydraulic or spring type on trolleys (or ends of bridge girders) and bridge end trucks. Design bumpers to withstand rated load at rated speed IAW AIST TR-6. Fully mate bumpers with the end stops and crane bumpers where applicable. Mount bumpers to provide proper clearance when bumpers are fully compressed. Where practical, mount bumpers to provide for easy removal of the travel wheels. Ensure trolley and bridge end truck frames are designed so that travel wheels do not contact the end stops. Design and install bumpers per the requirements of ASME B30 with a means of retaining the bumper in case of broken or loosened mounting connection(s).

D102001 1.8.14 Keys and Keyseats

Provide parallel type and machined key/keyseat assemblies. Install the key/ keyset assembly in a manner that preclude any possibility of a key shifting out of its intended position.

D102001 1.8.15 Fits

Interference fit all gears, pinions, couplings, brake drums, wire rope drums, wheels, other similar components to their respective shaft or axle. Interference fits must conform to the force fit requirements prescribed in ANSI B4.1 and must be medium drive fits unless length of engagement, material, or loading indicates otherwise. Alternatively, in bridge and trolley drives, keyless hub-to-shaft connections shall be permitted where minimum potential interface fits capable of transmitting maximum torque (not less than 200% rated motor torque) is provided. The individual component manufacturers must endorse these interference fits. Fit bearings, bushings, and seals in accordance with the manufacturer's recommendations. Where multiple interference fitted components are installed on a single shaft from the same end, there must be clearance between each

component's bore and the portion of the shaft from the installation end up to its mounting location. Fits of components within standard commercial assemblies, such as gear reducers and electric motors, must comply with the applicable industry standards or with the manufacturer's standard practice if industry standard criteria are not available.

D102001 1.8.16 Bearings

Provide anti-friction type bearings, except those subject to a small rocker motion. Use permanently lubricated sealed bearings wherever practical. Provide an easily accessible means of lubrication for bearings not considered lifetime lubricated by the manufacturer. Supply inner races for all antifriction bearings, except that bearings without inner races are permitted as part of packaged hoist unit. If a pedestal bearing is used to support the drum, the bearing housing must be steel.

D102001 1.8.17 Bushings and Thrust Washers

Fit all connections, including equalizer sheaves or bars, subject only to small rocking motion with bronze bushings and/or thrust washers, as applicable. Groove bushings to distribute lubricant.

D102001 1.8.18 Painting of System

Protect all parts of the cranes against corrosion. Clean, prime, and finish paint all surfaces normally painted at the contractor's plant as specified hereinafter. Do not paint, coat, or galvanize the following surfaces: load chain, hoisting rope, load hook, suspension hook, load hook nut, suspension hook nut, load chain sheave (sprocket), wire rope contact areas of sheaves and drum, trolley and travel wheel treads, gear teeth, load bearing surfaces of travel rails, machined surfaces that are bearing surfaces, lubrication fittings, corrosion resistant steel, bronze, anodized aluminum, name plates, flange mounting faces, other items not normally painted, and wheel tread contact surfaces of runway beams. Provide painting systems and scheme as follows:

a. Paint Systems. Provide primer coat and the finish coat of paint that is smooth, even and free of runs, sags, orange peel, or other defects. Take precautions to avoid painting surfaces specified as non-painted. Any painted over grease fittings must be replaced; they may not be cleaned and reused. Provide a painting system that consists of anti-corrosive primer and topcoat(s) appropriate for the intended environmental conditions. The primer and topcoat(s) must be compatible with each other, the substrate, and be products of the same manufacturer. Apply primer and topcoat(s) in accordance with the manufacturer's recommended process. The use of paint containing lead or mercury is prohibited. Identify the primer and finish coats in the technical manual or drawings.

b. Painting Scheme. The painting scheme is as follows:

(1) Paint crane structural beams, hook block, and end trucks brilliant yellow.

(2) Paint sides of hook blocks to have additional gloss black diagonal safety striping.

(3) Paint faying surfaces of slip-critical structural bolted connections, both interior and exterior, with coatings as specified in RCSC Specification for Structural Joints Using High Strength Bolts".

(4) Clean and repaint any painted surfaces damaged during erection.

(5) Paint other components not specified above. The color and coating may be in accordance with the component manufacturer's standards.

D102001 1.8.19 Identification Plates

Provide two capacity plates with permanent lettering, one for each side of the bridge, monorail. Indicate the rated hoisting capacity of the hook in pound units on the plates and securely attach each plate. Size lettering to be easily read from the floor. Beneath the rated capacity the following information shall be included:

Naval Facilities Engineering Command

Contract Number

Manufacturer's name, address, crane model number and crane serial number

Voltage of AC or DC power supply, and phase and frequency of AC power supply, if applicable.

D102001 1.8.20 Direction Identification

Provide cardinal direction indication letters centered on the bottom of each trolley where space permits. Denote North, South, East, and West and reflect the travel directions given on the controller. Size lettering to be easily read from the floor.

D102001 1.8.21 Unique Identifier Tag

In accordance with DEFENSE FEDERAL ACQUISITION REGULATIONS (DFAR) 252.211-7003, assign a unique identifier to the crane. Attach the Unique Identification Tag to the outside of the main electrical disconnect panel.

D102001 1.9 ELECTRICAL DESIGN

Electrical design must conform to CMAA #70, CMAA #74, MH 27.1, ASME B30.2, ASME B30.16, as applicable, NFPA 70, NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION (NEMA) ICS 7, NEMA ICS 8, and other requirements specified herein. Each drive mechanism must be provided with a separate and independent drive unit with a circuit breaker branch circuit protection device capable of being locked in the open position. Design the electrical system to allow simultaneous motions of the main hoist and all traversing functions, and ancillary loads. Design the crane to operate on the designated power

supply.

Provide disconnecting means for cranes and monorail hoists in accordance with NEC 610.32. Disconnecting means provided for cranes must be a lever arm type switch (rotary type switches are not acceptable) located in a separate enclosure on the crane. Configure crane disconnects such that when the disconnect is secured, there are no energized conductors in any associated control panels.

Provide a separate runway disconnecting means in accordance with NEC 610.31. Runway disconnect switches for runways or monorails longer than 50 feet must be at the midpoint of the runway as much as possible.

Feed all control circuits from a single phase, air cooled, double-wound transformer. Furnish and install all electric drive equipment on the crane, including motors, brakes, switches, controllers, panels, items associated with the pendant, wiring system, cables, and electrification. All contactors and relays must have appropriate MOVs or R-C surge absorbers installed across the respective device's coil. Do not mix power and control cables in the same conduit in order to prevent interference where feasible.

D102001 1.9.1 Electrical Assembly

Install electrical wiring, conduit, and components in accordance with the requirements of NFPA 70. As a minimum, comply with the following items:

a. Install all electrical connections in accordance with NFPA 70 sections 110.14 or 430.9, as applicable, or as recommended by the device manufacturer.

b. If used, properly size crimped terminal lugs for the wire and install using the device(s) - e.g., crimping tool and indenter - recommended by the terminal lug manufacturer.

c. Identify all spare conductors, and insulate their ends to preclude accidental contact with energized equipment.

d. Adhesive-backed wiring tie wraps and cable-clamping devices can not be used unless they are secured with fasteners, in addition to the adhesive.

e. Bond all panel doors, back sheets, and panel boards with flexible bonding straps.

f. Remove paint from termination points, or install "cut" washers to insure proper grounding of equipment at bonding straps and equipment grounding conductors.

g. Wrap wiring around sharp edges, such as panel doors, to protect sleeves (e.g., "spiral wrap") and prevent wiring insulation damage from chafing, cutting or abrasion.

h. Control panels can not be used as raceways for conductors not terminating within the panel.

i. Use bushings or chafing protection gear on all panel conduit entries.

j. Mount only equipment that needs to be viewed or accessed from the panel door (i.e. dataloggers, key switches, pilot lights, etc.) on the panel door.

k. Tie wraps are prohibited as a permanent mounting means on festoon loops.

l. Flexible metal conduit may be used in lieu of ferrous rigid metal conduit for lengths of three feet or less when flexible connections are needed for motors and lighting.

m. Excluding conduit directly connected to dynamic breaking resistors, raceways shall maintain a 12-inch clearance between the raceway and dynamic braking resistors.

n. Route a separate grounding wire, sized in accordance with Section 250-122 of NFPA 70, with all ungrounded conductors.

o. Number or tag all wiring at all connection points.

p. Label power conductors which are shielded as to the conductor size.

q. Plug all unused conduit openings.

r. Terminate all conductors on terminal blocks; splices are not acceptable, with the following exceptions:

(1) Motor and brake connections may be made using split-bolts or lugged and connected with nuts, bolts, flat washers and lock washers in lieu of installing a terminal block in the motor connection box.

(2) Wire-nuts are not permitted except where making connections for lighting ballasts. Secure wire nut connections such that during operation of the crane they will not loosen.

(3) Provide encoder conductors with a continuous run from the encoder to the drive. Use fiber optic cable if the length of cable required between a drive and its respective encoder is longer than 150 feet.

(4) Wire terminals with more than one wire must be rated by the manufacturer for use with multiple wires.

D102001 1.9.2 Enclosures

Provide enclosures for control panels and auxiliary devices in accordance with UL or CSA listed metallic NEMA type 12 for indoor cranes or NEMA Type 4X stainless steel for all outdoor cranes as defined by NEMA Standards Publication Number 250. Design enclosures with appropriate heating and/or cooling accessories to maintain a climate within the panel that provides an appropriate internal temperature environment for proper operation of the drives. Condensation inside the control panels is not acceptable. Provide

industrial grade electrical components and located so they are easily accessible for inspection and maintenance.

D102001 1.9.3 Wiring System

Unless otherwise specified, provide interconnecting wiring of copper stranded construction complying with Table 310-13 of NFPA 70. Aluminum conductors are prohibited. Aluminum connectors are allowed if they are rated for use with copper conductors (marked AL/CU). All conductors connected to or routed above resistors must have at least 8 inches clearance, with the exception of type SA and FEPB insulation shown in NFPA 70 (National Electric Code (NEC)) Table 610-14(a) for 125Â°C maximum temperature. Size motor branch circuit conductors to have an ampacity not less than 150% of the motor full load current rating and to be no smaller than 12 AWG. Conductors must be selected and de-rated based on maximum ambient temperature. Continuous loads such as utility, heating, lighting, and air conditioning must be multiplied by 2.25 to determine ampacity in order to permit application of NFPA 70 NEC 610-14 (e) for crane supply conductors. Provide raceways of ferrous rigid metal conduit.

D102001 1.9.4 Drive Mechanism Electric Motors

Provide electric drive mechanism motors that conform to NEMA MG 1. Hoist, bridge and trolley drive motors shall be AC inverter duty, totally enclosed non-ventilated (TENV) or totally enclosed fan cooled (TEFC), squirrel cage induction type. All motors must have a 60 minute duty rating minimum. Provide motor insulation of a minimum of Class F, but with a Class B temperature rise. Furnish motors located outdoors with anti-condensation heaters.

Equip motors with thermal trip type over-temperature protection. Provide automatic resetting type temperature sensors installed integral to the motor windings. Activation of any integral motor over-temperature device energizes a red indicating FAULT light mounted on the crane and de-energizes the individual function as follows:

a. Hoists: hoisting direction only

b. Traverse Functions: motion in either direction.

The red indicating fault light remains energized until the over-temperature device resets.

D102001 1.9.5 Hoist, Trolley, Bridge Electric Controls

Comply with the following hoist, trolley and bridge controls requirements:

a. Provide static reversing, adjustable frequency controllers for all functions. Provide all controllers with a keypad or other interface allowing the end user to view/change parameters and view drive faults. Hoist drives are required to be selected such that the continuous rating of the controller is not less than 130% of the calculated motor full load current based on CMAA #70 paragraph

5.2.9.1.1.1, regardless of crane configuration, NFPA 70 NEC Table 430.250, and NEMA ICS7. Equip all hoist drives with a motor overtorque limit to lock out the hoist and prevent gross overload of the associated hoist. Set the overtorque limit such that an overload test can be performed without tripping the overtorque fault. All controllers must be from the same manufacturer. Each electric drive requires dynamic braking. Provide infinitely variable type speed control for each function. Design controls such that the maximum speed of each function is limited to 25% of rated speed when a slow speed switch is actuated on the operator's controller. Energize a yellow/amber light mounted on the crane while in slow speed mode.

b. Set all function brakes only after the associated controller decelerates the drive motor to a controlled stop. Size all controllers to provide sufficient starting torque to initiate motion of that crane drive mechanism from standstill with 0 to 131.25% of rated load on the hook and not produce any rollback. The hoist controller must enable the drive motor to develop full torque continuously at zero speed. Motors must operate smoothly at all speeds without torque pulsations, and only be energized within the frequency range of 50-60 Hz at rated speed. With respect to AC control wiring, no neutral wire shall pass through the contacts of a control relay or contactor, i.e., a device shall not be shut off or disengaged by breaking the device's neutral conductor.

D102001 1.9.6 Transients and Harmonic Protection

Provide varistors for transient protection internal to the controller. Minimum harmonics protection must consist of a reactor connected in series with each controller's line (input) terminals. Rate all reactors for continuous duty operation based upon motor nameplate amperes and design for 60 HZ operation. For a drive motor branch circuit that exceeds 100 feet in length, connect a reactor in series with the controller load (output) terminals to provide standing wave protection.

D102001 1.9.7 Drive Faults

Energize a red indicating FAULT light visible to the operator for drive faults.

D102001 1.9.8 Brake Controls

Release each drive mechanism's electro-mechanical brake only upon movement of the electric drive's controller from the OFF position and verification of motor torque, and set only after the electric drive's controller is returned to the OFF position and motors have regeneratively slowed to a controlled stop.

D102001 1.9.9 Main Line Contactors

Provide a main line contactor. Control energization of the main line contactor by a POWER-OFF/POWER-ON pushbutton on the control station. Except for the POWER OFF-POWER ON circuit, the control circuit including directional contactors must not be energized without energization of the mainline contactor. Provide black POWER-ON

pushbutton and equipped with a guard to prevent accidental actuation. Provide red POWER -OFF mushroom-head pushbutton with no guard for quick and easy access.

D102001 1.9.10 Electrical Overload Protection

Protection must not be less than required by NEMA ICS 8, CMAA #70, MH 27.1, and NFPA 70. Use circuit breakers or fuses for protection. Individually protect motor branch circuits by circuit breakers capable of being locked in the open position to isolate that function without use of a portable lockout device. Calculate the circuit breaker size using the motor full load current from NEC 430, Part XIV (Tables).

D102001 1.9.11 Operator Controls

Comply with the following operator control requirements:

a. Control cranes from a radio control station where permitted, or pendant pushbutton station if radio frequency control is not desired (see project program for control configuration). Legibly mark and arrange operator controllers in accordance with ASME B30 guidance, except label traverse functions of bridge cranes with ordinal directions (NORTH, SOUTH, EAST, WEST) to agree with direction labels on the cranes. Provide all pushbuttons and levers with spring returns to the OFF position upon operator's release. Also provide a maintained two-position selector switch for slow speed selection and an ON/OFF switch for flood lights, if equipped. Equip operator stations to accept keys enabling a user to lock out the station from use.

b. Suspend pendant pushbutton stations by a 1/8 inch minimum stainless steel wire rope strain lead from an independent festoon system. Provide strain relief hardware consisting of a stainless steel wire mesh cable grip. The pendant pushbutton station must be a rubber molded enclosure. Provide pendant cable of type SOO.

c. Include an identical back-up transmitter unit for each radio control system. Provide portable transmitters that weigh not more than eight pounds each (including the batteries and antenna), with an adjustable belt or harness to support it when worn by the operator. Ensure that only one transmitter at a time can control the crane and assure interference from one crane's controller does not affect operation of the other cranes in the building. Each transmitter includes: individual spring return joystick motion control levers for each function; a maintained contact, keyed switch, marked ON-OFF, for portable transmitter unit power; one or more LEDs indicating POWER ON, TRANSMITTING and LOW BATTERY; a red emergency STOP mushroom pushbutton; a 25% speed selector switch; a maintained switch to control the floodlights (if equipped); and a separate auxiliary pushbutton for a crane warning device (horn).

d. Design the remote radio control system to meet the requirements of NEMA ICS 8, Part 9. Each radio remote control lever must be in the OFF position before the associated crane function can begin. Choose the system frequency to be within the unlicensed FCC Part 15 range,

unless licensed frequency is required by the end User. Maintain a continuous status signal between each control unit and the associated receiver. Provide a contact monitoring board with each crane radio system receiver.

e. Use rechargeable type batteries in the radio transmitter. Provide a minimum of three sets of batteries (one for each transmitter plus one on recharge). There must be no significant loss in systems efficiency and function at the end of eight hours of continuous battery use. Provide a battery charger.

D102001 1.9.12 Pendant Conductor System

Operate the pendant controller on its own independent festoon system. The festoon cables must consist of flat cables suspended from carriers riding on a rigid I-beam or similar type beam. The pendant controller must be capable of traveling the entire length of the bridge. Festoon loops must not extend below the high hook position. Provide at least 20% of the conductors to be spare at the time of crane acceptance. Pendant festoon systems must move independently of the trolley.

D102001 1.9.13 Indicator Lights and Warning Devices

Comply with indicator lights and warning device requirements as follows:

a. Install indicator lights and beacons with LED type lights sized to be visible from the operator's location. Provide a white light to indicate that power is available on the load side of the crane disconnect, a blue light to indicate that the main line contactor is energized, a yellow/amber slow speed light, and a red fault warning light to indicate a drive fault or motor over-temperature. Design light to use 115 VAC voltage. Provide nameplates with lettering of sufficient size to be easily read from the floor. The nameplates must read in their respective order "POWER AVAILABLE", "POWER ON", "SLOW SPEED", and "FAULT".

b. Install a lamp test pushbutton on the outside of the control panel to allow for simultaneously energizing all lights in this section for testing purposes.

c. Provide a wind indicating device for outdoor cranes. This device must either provide a visible or audible alarm to the crane operator(s) when the wind velocity exceeds a preset limit. Assure that the chosen device does not conflict with any other previously listed indication/warning.

D102001 1.9.14 Overtravel Limit Switches

Comply with the overtravel limit switch requirements as follows:

a. See requirements in paragraph entitled HOIST for numbers and types of overtravel limit switches required by hoist type.

b. Hoist Limit Switch Settings. Set each primary upper limit switch at the maximum practical hook height but not lower than high hook

position. Set the secondary upper limit switch not lower than the hook height of the primary upper limit switch setting plus the primary runout distance, but not less than the secondary runout distance below the lowest contact point of the hoist or trolley structure (two-block condition). (The runout distances are defined as the load block maximum drift, after switch activation, in the hoisting direction at rated speed with no load on the hook. Primary and secondary runout distances are associated with the primary and secondary upper limit switches, respectively.)

c. Hoist Slow-Down Limit Switches. Slow down limit switches may be used, set below the primary upper limit switch, to automatically decrease the hoisting speed to a predetermined slow speed before tripping the primary upper limit switch. The runout distances would then be defined as the load block maximum drift, after slow down switch activation, in the hoisting direction at slow speed with no load on the hook.

D102001 1.9.15 Runway Electrification

Comply with the following runway electrification requirements

a. Provide a runway electrification system to power the crane and connect it to the crane runway disconnect. Refer to the facility final design for the length of the system. Runway electrification for crane must be of the flat festooned type or enclosed safety bar type (see project program) with four continuous copper conductors. Ground the crane through the runway electrification system. Provide electrical work in accordance with Section D50, Electrical.

b. Rigid runway electrification systems shall include all necessary hardware to the crane or monorail system from a wall or column mounted disconnect switch. Provide discreet rail type rigid runway electrification systems such that sections can be easily replaced if damaged and have insulating covers. Make outdoor rigid runway electrification systems with stainless steel or be coated specifically to prevent corrosion and use UV resistant insulating covers. Design rigid runway electrification systems for a dusty environment, consisting of three power conductors and an equipment grounding conductor. Color the ground runway conductor green, if individual conductor bars are used (not a 4-conductor system).

c. For overhead cranes, install a guard if normal crane operations could result in the hook block or wire rope contacting the conductors.

d. Provide heavy duty sliding shoe type design for collectors and specifically design to match conductor contact surface. Collector arms must be insulated, spring loaded and shall permit sufficient lateral and vertical movement to allow for imperfect track and for misalignment relative to the crane. Provide two collector shoes (tandem design) for each conductor; each collector shoe to be rated for its branch circuit current, or higher so as to provide redundancy.

e. Utilize flat cables suspended from carriers riding on an I-beam or C-track for festooned type electrification systems. Select the conductors so as to be of the longest length without splices.

Fabricate conductors from copper. Provide a minimum of 20% of the festoon control circuit conductors for each electrification system to be spares at the time of crane acceptance. Festooned cable loops must not extend below the high hook position. Provide UL or CSA listed materials.

f. Size runway conductors for simultaneous motions of the main hoist plus all traverse crane functions plus any ancillary loads. When more than one crane makes use of the same runway electrification, size the system to accommodate simultaneous operations of the main hoist plus all traverse functions of all cranes at once.

D102001 1.9.16 Bridge-to-Trolley Electrification

Utilize flat cables suspended from carriers riding on an I-beam or C-track for festooned type electrification systems from bridge-to-trolley. Select the conductors so as to be of the longest length without splices. Fabricate conductors from copper. Provide a minimum of 20% of the festoon control circuit conductors for each electrification system to be spares at the time of crane acceptance. Electrically powered trolleys are required to be grounded through this conductor system. Festooned cable loops must not extend below the high hook position. Provide UL or CSA listed materials.

D102001 1.9.17 Nameplates

Provide nameplates for all electrical control equipment such as contactors, relays, transformers, etc., and all electrical panels. As a minimum, identify the associated function and system designation on each nameplate. Retain all electrical component nameplates, markings, etc. provided by the original manufacturer.

D102001 1.9.18 Electrical Outlets

For cranes with maintenance walkways, provide a minimum of one 120 VAC duplex outlet on the crane. Mount the outlet on the outside of the control panel(s). Incorporate ground-fault circuit-interrupter protection and a circuit breaker with a minimum rating of 15 amps for protection of circuit supplying receptacles.

D102001 1.9.19 Flood Lights

Provide flood lights where the crane, hoist or trolley cast a shadow on workstations. Select flood lights to match the building lighting color and intensity. Evenly space the light bulbs along the crane to provide a minimum illumination level of 50 foot-candles at three feet above the finished floor. Provide all light fixtures rated for rough service, vibration resistant, and designed to prevent any material from falling from the fixture. Equip the lights with safety cables to prevent the fixtures from falling to the floor if dropped while being serviced. For cranes with maintenance walkways, locate the lights to be serviceable from the walkway(s). Provide a switch on the operator's controller to operate the floodlights.

D102001 1.9.20 Capacity Overload Protection

Provide overload limiting for each hoist motor circuit separate from the hoist drive overtorque limit specified in paragraph above entitled HOIST, TROLLEY, BRIDGE CONTROLS. The device must have a maintained keyed override located on the control panel that can be deactivated during overload testing. When an overload is detected limit the hoist function to the lowering direction only. Resetting of the overload shall only be accomplished by moving the hoist in the down direction or by cycling power. Initially set the overload limit at 100% and ensure that it is adjustable from 80% to 150% of rated capacity.

D102001 1.9.21 Hour Meter

Provide a non-resettable hour meter, connected across the main line contactor, readable from the exterior of the main control panel, to indicate the elapsed number of hours the crane is energized. Additionally provide non-resettable hour meters for each function, readable from the exterior of the main control panel, connected to each function's brake contactors to indicate the running time of each individual function.

D102001 1.10 PNEUMATIC DESIGN

Pneumatic design must conform to CMAA #70, MH 27.1, ASME B30.2, ASME B30.16, ASME HST-5, ASME HST-6 as applicable, and other requirements specified herein. The pneumatic power for the crane must be fed from a junction with a quarter-turn to off valve, accessible to the crane or monorail system operator, capable of being locked in the off position. Disconnect valves for runways or monorails longer than 50 feet must be at the midpoint of the runway as much as possible. The pneumatic supply system must have capacity to allow simultaneous motions of all hoisting and traversing functions. Design the crane to operate on the designated pressure and flow rate. Configure disconnect valves such that when a valve is secured, there are no other sources of air supply to any part of the crane.

D102001 1.10.1 Pneumatic Assembly

Perform Installation of all pneumatic piping and components as stated below:

a. Install all pneumatic piping and connections as recommended by the device manufacturer.

b. Use rigid metal piping of the correct pressure rating for all piping runs. Flexible lines may be used in lieu of rigid metal piping for lengths of three feet or less when flexible connections are needed between components. Flexible lines must be rated for the system pressure.

c. Number or tag piping at all connection points.

d. Pressure test piping runs to ensure that they are free of leaks prior to connection to cranes.

e. Provide system fittings, piping and connectors exposed to the outdoor environment of corrosion resistant material.

D102001 1.10.2 Drive Mechanism Pneumatic Motors

Provide pneumatic drive mechanism motors with adequate power and starting torque and operate without perceptible vibration at any of the hoist loads or speeds within the rated load and speed capacity. The hoist motor may be either axial piston or rotary vane type.

D102001 1.10.3 Overload Protection

Equip the hoist with overload protection to prevent gross overload and any resulting damage to the crane or monorail system. The device must allow load testing at up to 131.25% of rated capacity. If adjustable, initially set the overload limit at 100% of rated capacity. Limit hoist operation to the lowering direction only when an overload occurs.

D102001 1.10.4 Operator Controls

Comply with the following operator control requirements:

a. Provide an operator station suspended from the hoist/trolley unit. Pull cord or rod controls are not desired. Legibly mark and arrange control stations functions in accordance with ASME B30 guidance, except that traverse functions of OETs are labeled with ordinal directions (NORTH, SOUTH, EAST, WEST) to agree with direction labels on the cranes. Spring return all levers to the OFF position upon operator's release.

b. Suspend operator station by a 1/8 inch minimum stainless steel wire rope from the hoist/trolley unit structure.

D102001 1.10.5 Overtravel Limit Switches

Provide a lift limiting device so that the load hook, either loaded or empty, at any operating speed, will not allow the load block to contact the hoist frame. Install a stop or other device to prevent the load hook from being lowered beyond the hoist design limit of travel.

D102001 1.10.6 Runway Air Supply

Comply with the following runway air supply requirements:

a. Provide a runway air supply system, including retractable hose reel, to power the crane and connect it to the crane runway disconnect. Refer to the Project Program for the operating length of the system.

b. Pneumatic supply emergency shut-off devices must be readily accessible from the floor, and located within proximity to the crane runway, monorail track system.

c. Size runway air supply piping for simultaneous motions of all crane functions plus any ancillary loads. When more than one crane makes use of the same runway air supply, size the system to accommodate simultaneous operations of all functions of all cranes at once.

D102001 1.10.7 Nameplates

Provide nameplates for all pneumatic control equipment. As a minimum, identify the associated functions and system designations on each nameplate. Retain all pneumatic component nameplates, markings, etc. provided by the original manufacturer.

D102001 1.10.8 Hour Meter

Provide a non-resettable meter in the air supply calibrated to indicate the elapsed number of hours the crane is operating.

D102001 1.10.9 Pressure and Flow Regulation

Provide a device to limit inlet pressure and air flow in line between the air supply and the crane air inlet, mounted at the level of the hoist. The device(s) must ensure pressure does not exceed the rated pressure at the hoist and that the crane or monorail system functions at the desired speed and capacities. The device must allow sufficient air flow and pressure to operate the brake release mechanism.

D102001 1.10.10 Moisture Separator/ Oiler

Provide a device in the supply line to the crane or monorail to remove moisture and add lubrication to the incoming air supply.

D102002 OVERHEAD CRANES

In accordance with the project program, provide an overhead top running multiple girder bridge cranes, single girder top running bridge crane, single girder underrunning bridge crane, monorail system, or hoist with the required equipment quantity, span, runway length, capacity and hook height needed to fulfill the mission of the end user.

D102002 1.1 TOPRUNNING MULTIPLE GIRDER CRANE

Provide a top running multiple girder crane with hoist and trolley complete, tested and ready for operation. The crane, hoist and trolley must be electrically, pneumatically or manually powered in compliance with the Project Program. Crane, hoist, trolley, equipment, materials, installation, examination, inspection, and workmanship must meet the applicable requirements of ASME B30.2 and CMAA 70, Class C minimum, as modified and supplemented by this specification. Provide the following girder crane components in addition to the general requirements of the paragraphs entitled BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS above.

D102002 1.1.1 Bridge Girders

Provide welded box section type bridge girders for spans greater than 40 feet. For spans less than 40 feet, open web girders may be used. Minimize splices in the bridge girder and avoid splices in locations of high stress. Provide full penetration welds at splices. Design bridge girders to be end notched to fit over the end truck.

D102002 1.1.2 Bridge Rails

Select bridge rails from the sizes listed in CMAA #70, Table 4.13.3-4; do not use solid stock material (square, round or rectangular) for bridge rails. Select the rails so that the allowable wheel loads are not exceeded by the design rated load on the hoist. Attach the rails to the bridge girders with pairs of adjustable rail clips spaced not more than 36 inches apart designed per the wheel loading design. Secure the rail clips to the top flange of the bridge girder by welding. If rail joints cannot be avoided due to the length of the span, the joints shall be staggered and located directly over girder diaphragms. Provide rail joint gaps less than 1/32 of an inch. Weld creep bars in place at each end of the rail. Locate bridge rails above the shear center of the girder.

D102002 1.1.3 Walkways

Where necessary to access maintainable features, provide full length maintenance walkways on both girders with crossovers at the end trucks to allow movement between girders. At least one walkway shall have a means of boarding the crane and shall match the elevation and position of the access platforms located in the building.

D102002 1.1.4 Hoist and Trolley

Provide electric, air-powered, or manual hoist and trolley in compliance with the general requirements of paragraphs entitled BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS above and the specific requirements of HOISTS below.

D102002 1.1.5 Bridge and Trolley End Trucks

Provide end trucks of box section design with wheels centered between the webs. Commercially available end trucks that are not box section may be used for bridge spans less than 40 feet. Equip end trucks for the bridge and trolley with rail sweeps that conform to ASME B30.2 extending below the rail head designed to move an obstruction.

D102002 1.1.6 Drop Lugs

Provide safety lugs or drop lugs to prevent bridge and trolley end trucks from dropping more than one inch or derailing in the event of wheel or axle failure.

D102002 1.1.7 End Stops

Provide end stops on the building runway and bridge girders designed and installed in accordance with AIST TR-13 to resist crane bumper and trolley bumper dynamic forces specified in AIST TR-6. Do not bolt end stops to the bridge rails.

D102002 1.1.8 Major Component Attachments for Lifting and Handling

Design and fabricate major components (e.g. bridge girders, end trucks, and trolleys) with structural or mechanical attachment points (lifting lugs, safety hoist rings, hoist rings or approved equivalent) when they are to be lifted or handled by suspended rigging.

D102002 1.2 TOP RUNNING BRIDGE, UNDERRUNNING HOIST SINGLE GIRDER CRANE

Provide a top running bridge, underrunning hoist/trolley crane with hoist and trolley complete, tested and ready for operation. The crane, hoist and trolley must be electrically, pneumatically or manually powered in compliance with the Project Program. Crane, hoist, trolley, equipment, materials, design, installation, examination, inspection, and workmanship must be in accordance with the applicable requirements, (shall statements) and recommendations (should statements), ASME B30.17, and MH 27.1, Duty Class C, as modified and supplemented by this specification. Provide the following bridge/ girder crane components in addition to the general requirements of the paragraphs entitled BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS above.

D102002 1.2.1 Bridge Girder

Provide bridge girders for single girder cranes not to exceed 50 feet in any single span. Provide a bridge girder of specially designed trackage in accordance with MH 27.1 Duty Class C, e.g., patented track beam constructed from welded steel components. Minimize splices in the bridge girder and avoid splices in locations of high stress. Provide full penetration welds at splices. Design bridge girders to be end notched to fit over the end truck.

D102002 1.2.2 Hoist and Trolley

Provide electric, air-powered, or manual hoist and trolley in compliance with the general requirements of the paragraphs entitled BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS above and the specific requirements of HOISTS below.

D102002 1.2.3 Bridge End Trucks

Provide end trucks of box section design with wheels centered between the webs except that commercially available end trucks that are not box section may be used for bridge spans less than 40 feet. Equip end trucks with rail sweeps that conform to ASME B30.17 extending below the rail head designed to move an obstruction.

D102002 1.2.4 Drop Lugs

Provide safety lugs or drop lugs or a functionally equivalent feature on the trolley frame and end truck frames to prevent a drop of more than one inch in the event of wheel or axle failure.

D102002 1.2.5 Trolley Stops

Provide extended wrap-around trolley frame plates or similar to contact the end stops. The trolley wheels shall not contact the end stops.

D102002 1.2.6 End Stops

Provide end stops on the bridge runway designed and installed in accordance with AIST TR-13 to resist crane bumper dynamic forces specified in AIST TR-6. Trolley end stops may be the standard product

of the bridge girder manufacturer.

D102002 1.2.7 Major Components Attachments for Lifting and Handling

Design and fabricate major components (e.g. bridge girders, end trucks, and trolleys) with structural or mechanical attachment points (lifting lugs, safety hoist rings, hoist rings or approved equivalent) when they are to be lifted or handled by suspended rigging

D102002 1.3 UNDERRUNNING BRIDGE, UNDERUNNING HOIST, SINGLE GIRDER CRANE

Provide an underrunning single girder bridge crane with underrunning hoist and trolley complete, tested and ready for operation. The crane, hoist and trolley must be electrically, pneumatically or manually powered in compliance with the Project Program. Crane, hoist, trolley (carrier), end trucks, equipment, materials, installation, examination, inspection, and workmanship must be in accordance with the applicable requirements of ASME B30.11, and MH 27.1, Duty Class C, as modified and supplemented by this specification. Crane girder and runway tracks must be patented track. Provide the following bridge/girder crane components in addition to the general requirements in the paragraphs entitled BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS components above.

D102002 1.3.1 Bridge Girder

Provide bridge girders for single girder cranes not exceed 50 feet (except top running multiple girder cranes) in any single span. Provide a bridge girder of specially designed trackage in accordance with MH 27.1 Duty Class C, e.g., patented track beam constructed from welded steel components. Minimize splices in the bridge girder and avoid splices in locations of high stress. Provide full penetration welds at splices.

D102002 1.3.2 Runway Rails

Provide runway rails in accordance with MH 27.1 of length and span to meet the requirements of the facility final design. Attachment to overhead structures or building columns must be as shown in the Project Program without exceeding design loads.

D102002 1.3.3 Hoist and Trolley

Provide electric, air-powered, or manual hoist and trolley in compliance with the general requirements of the paragraphs entitled BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS above and the specific requirements **HOISTS** below.

D102002 1.3.4 Drop Lugs

Provide safety lugs or drop lugs or a functionally equivalent feature on the trolley frame and end truck frames to prevent a load drop of more than one inch or derailing in the event of wheel or axle failure.

D102002 1.3.5 Stops

Provide extended wrap-around trolley frame plates or similar to

contact the trolley end stops. The trolley wheels shall not contact the end stops. End stops on the bridge and trolley runway may be the standard product of the runway and bridge girder manufacturer.

D102003 MONORAILS

Provide a monorail system with hoist and trolley complete, tested and ready for operation. The hoist and trolley must be electric, pneumatic, manual or push operation as indicated in the Project Program. Crane, hoist, trolley, equipment, materials, installation, examination, inspection, and workmanship must be in accordance with the applicable requirements of ASME B30.11 and MH 27.1, Duty Class C, as modified and supplemented by this RFP. Monorail must be patented track. In addition to the general requirements of the paragraphs entitled BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS above, the following design requirements apply:

D102003 1.1 HOIST AND TROLLEY

Provide electric, air-powered, or manual hoist and trolley in compliance with general requirements of the paragraphs entitled BASIC REQUIREMENTS FOR CRANES OR MONORAILS WITH HOISTS/TROLLEYS above and the specific requirements of HOIST below.

D102003 1.2 MONORAIL BEAM

Provide the monorail beam of specially designed trackage in accordance with MH 27.1 Duty Class C, e.g., patented track beam. Provide standard catalog devices for connection of the track to the indicated supporting structures. If track manufacturer's catalog devices are not provided for this suspension system, complete shop drawings and calculations for each custom suspension device must be submitted for review.

D102003 1.3 DROP LUGS

Provide safety lugs (drop stops) or a functionally equivalent feature on the trolley frame to limit trolley drop to 1 inch in the event of wheel or axle failure.

D102003 1.4 TROLLEY STOPS

Provide trolley stops to stop trolley motion at both ends of the monorail. Extended wrap-around trolley frame plates or similar to contact the end stops. The trolley wheels shall not contact the end stops.

D102003 1.5 END STOPS

End stops may be the standard design of the monorail manufacturer.

D102004 HOIST

Comply with the packaged hoist units design requirements of ASME HST-1 (electric chain), HST-2 (hand chain), HST-4 electric wire rope), HST-5 (pneumatic chain) or HST-6 (pneumatic wire rope), with modifications as specified herein. Comply with the safety requirements of ASME B30.16 on all hoists.

D102004 1.1 CAPACITY

Provide the hoist minimum rated load capacity as required by the Project Program. Mark the hoist capacity in pounds on both sides of the hoist or load block. Size lettering to be easily read from the floor.

D102004 1.2 ELECTRIC POWERED WIRE ROPE HOIST(S)

Provide electric wire rope hoists to comply with "should" and "shall" statements of AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) B30.16 and ASME HST-4, Class H3 or higher, except as modified and supplemented herein. Provide double-reeved wire rope type hoist reeving systems.

D102004 1.2.1 Hoist Brakes

Equip each hoist with one electro-mechanical brake plus a mechanical load brake, each with a minimum torque rating of 131.25% of the rated motor torque. Provide adjustable brake torque settings on the electro-mechanical brakes. The electromechanical brake and mechanical load brake each must be able to independently stop and hold the maximum test load. Electro-mechanical hoist brakes must be provided with a manual, self-return to ON, release mechanism. Maintained OFF, release mechanisms are not permitted. Design all electro-mechanical hoist brakes to permit easy access for inspection and adjustment.

D102004 1.2.2 Hoist Limits

Provide electric powered wire rope hoist(s) limits as follows:

a. Provide two upper limit switches. Provide geared control circuit type primary switches (rope guide actuated limit switches are not acceptable). When the primary upper limit is reached, the operator must still be able to lower the block out of the upper limit switch. Lowering of the block must automatically reset the primary limit switch. The hoist secondary upper limit switch must be a mechanical block actuated control circuit type limit switch. The block actuated switch must remove all power from the affected hoist drive motor and brake independent of the hoist drive controller, utilizing a hoist line contactor, and set the brake when the secondary upper limit is reached. Provide a spring-returned three position keyed bypass switch on the hoist control panel to bypass the hoist limits. The far right position must allow resetting of the secondary upper limit switch prior to resuming operation. During resetting of the secondary limit, the hoist must operate in the lowering direction only. The far left position must allow bypassing of the primary upper limit switch to allow the secondary limit switch to be tested on a periodic basis. The center position of the bypass switch must be the NORMAL position with neither upper limit being bypassed.

b. Provide a geared control circuit type hoist lower limit switch. When the lower limit is reached, the operator must still be able to raise the block. Automatically reset the limit switch when the block is raised.

D102004 1.3 ELECTRIC POWERED CHAIN HOIST(S)

Provide electric powered chain hoists to comply with "should" and "shall" statements of AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) B30.16 and ASME HST-1, Class H3 or higher, except as modified herein and supplemented herein.

D102004 1.3.1 Hoist Brakes

Equip the hoist with one electro-mechanical brake plus a mechanical load brake, each with a minimum torque rating of 131.25% of the rated motor torque. Provide adjustable brake torque setting on electro-mechanical brakes. The electromechanical brake and mechanical load brake each must be able to independently stop and hold the maximum test load. Provide electro-mechanical hoist brakes with a manual, self-return to ON, release mechanism. Maintained OFF, release mechanisms are not permitted. Design all electro-mechanical hoist brakes to permit easy access for inspection and adjustment.

D102004 1.3.2 Chain Container

Equip chain hoists of 10 foot (3 meters) lift or more with a fabric or corrosion resistant metal load chain container.

D102004 1.3.3 Overtravel Limits

Provide a mechanical block actuated control circuit type upper limit switch or a chain stop with a geared upper limit switch to prevent two blocking of the hoist.

D102004 1.3.3.1 Block Actuated Switch

Provide a block actuated switch that does the following:

a. Remove all power from the affected hoist drive motor and brake independent of the hoist drive controller, utilizing a hoist line contactor, and set the hoist brake.
b. Include a spring-returned reset switch on the operator's controller to allow resetting the switch to resume hoist operation. When the spring-returned switch is activated but prior to exiting the limit switch, the hoist must operate only in the lowering direction.

D102004 1.3.3.2 Geared Upper Limit Switch

Provide a geared upper limit switch that does the following:

a. Provide a control circuit type and when reached, allow the operator to lower the block out of the limit. Automatically reset the limit switch when the block is lowered.
b. b. Include a spring-returned keyed bypass switch on the hoist control panel to bypass the limit for functional testing of the chain stop.

D102004 1.3.3.3 Geared Lower Limit Switch

Provide a geared control circuit type hoist lower limit switch

or chain stop. When the lower limit is reached, the operator must still be able to raise the block. Automatically reset the limit switch when the block is raised. If a geared lower limit switch is provided, then a chain stop is still required to prevent the load chain from running out of the hoist at its fully extended position.

D102004 1.4 PNEUMATIC POWERED WIRE ROPE HOIST(S)

Provide pneumatic powered wire rope hoists that comply with all "should" and "shall" statements of AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) B30.16 and ASME HST-6 Duty Class A4. Provide double-reeved wire rope hoist type reeving system.

D102004 1.4.1 Hoist Brakes

Equip the hoist with a braking system that can stop and hold 131.25% of the rated hoist capacity. The hoist braking system must be able to prevent uncontrolled lowering of the load in the event of a loss of air supply. Provide hoist brakes with a manual, self-return to ON, release mechanism. Maintained OFF, release mechanisms are not permitted. Design hoist brakes to permit easy access for inspection and adjustment.

D102004 1.5 PNEUMATIC POWERED CHAIN HOIST(S)

Provide hoist or hoist/trolley unit that complies with all "should" and "shall" statements of AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) B30.16 and the American Society of Mechanical Engineers (ASME) HST-5, Duty Cycle A4.

D102004 1.5.1 Hoist Brake

Design the hoist braking system to prevent an uncontrolled lowering of the load in the event of a loss of air supply, and can stop and hold 131.25% of rated capacity. Provide hoist brakes with a manual, self-return to ON, and release mechanism. Maintained OFF, release mechanisms are not permitted. Design hoist brakes to permit easy access for inspection and adjustment.

D102004 1.5.2 Chain Container

Equip chain hoists of 10 foot (3 meters) lift or more with a fabric or corrosion resistant metal load chain container

D102004 1.6 MANUAL HOIST WITH TROLLEY

Provide hoist or hoist/trolley unit that complies with all "should" and "shall" statements of AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) B30.16 and ASME HST-2.

D102004 1.6.1 Hoist Brake

Provide a hoist mechanical load brake that can stop and hold 131.25% of rated capacity.

D102004 1.6.2 Chain Container

Equip chain hoists of 10 foot (3 meters) lift or more with a fabric or corrosion resistant metal load chain container

D102004 1.6.3 Hoist Overload Limiting Device

Equip the hoist with a means to prevent destructive overloads.

D1030 ESCALATORS AND MOVING WALKS

Comply with ASME A17.1 and ASME A17.2.

D103001 ESCALATORS

Comply with ASME A17.1 and ASME A17.2.

D103002 MOVING WALKS

Comply with ASME A17.1 and ASME A17.2.

D109002 CONVEYORS

Comply with ASME B20.1, *Safety Standards for Conveyors and Related Equipment*.

SECTION D20

PLUMBING
09/15

D20 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

D20 1.1 NARRATIVE

This section must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation.

This section includes the construction of interior plumbing systems. This section covers installations inside the facility and out to the five foot line. See Section G30, *Site Mechanical Utilities*, for continuation of systems beyond the five foot line.

D20 1.2 PLUMBING DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

D20 1.2.1 Government Standards

Federal Energy Management Program (FEMP)

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-401-01, Mechanical EngineeringUFC 3-420-01, Plumbing Systems)
UFC 1-200-02	High Performance and Sustainable Buildings

D20 1.3 DESIGN SUBMITTALS

Design Submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine Corps Design Procedures*, and UFC 3-401-01, *Mechanical Engineering*.

D20 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

Fixtures, equipment, and OMSI information for all equipment and fixtures.

D2010 PLUMBING FIXTURES

Plumbing fixtures shall be provided in accordance with the IBC, IPC, and as specified. Provide EPA's "WaterSense" labeled fixtures where available.

D201001 WATER CLOSETS

D201001 1.1 FLUSH VALVE WATER CLOSETS

ASME A112.19.2, white vitreous china, siphon jet. Provide ASME A112.19.5 trim. Provide self-closing metering type flush valve, unless electronic flush control is specified in the ESR Section D20. Electronic flush control shall conform to UL 1951 and ASSE 1037. Flush valve shall not exceed 1.28 GPF (4.8 LPF). Handicapped fixture mounting height and appurtenances shall be in accordance with ABA Accessibility Standard.

D201001 1.2 DUAL FUNCTION FLUSH VALVE WATER CLOSETS

ASME A112.19.2, white vitreous china, siphon jet. Provide ASME A112.19.5 trim. Provide self-closing metering type dual function flush valve, unless electronic flush control is specified in the ESR Section D20. Electronic flush control shall conform to UL 1951 and ASSE 1037. Dual function flush valve shall provide a flush of 0.8 to 1.1 GPF (3.0 to 4.2 LPF) or 1.28 GPF (4.8 LPF). Maximum flush volume shall not exceed 1.28 GPF (4.8 LPF). Handicapped fixture mounting height and appurtenances shall be in accordance with ABA Accessibility Standard.

D201001 1.3 FLUSH TANK WATER CLOSETS

ASME A112.19.2, white vitreous china, siphon jet. EPA "WaterSense" labeled. Provide ASME A112.19.5 trim. Water flushing volume of the water closet shall not exceed 1.28 GPF (4.8 LPF). Handicapped fixture mounting height and appurtenances shall be in accordance with ABA Accessibility Standard.

D201001 1.4 DUAL FUNCTION FLUSH TANK WATER CLOSETS

ASME A112.19.2, white vitereous china, siphon jet. Provide ASME A112.19.5 trim. Dual function flush tank water closet shall provide a dual flush that allows a flush of 0.8 to 1.1 GPF (3.0 to 1.6 LPF) or 1.28 GPF (4.8 LPF). Maximum flush tank volume per flush shall not exceed 1.28 GPF (4.8 LPF).

Handicapped fixture mounting height and appurtenances shall be in accordance with ABA Accessibility Standard.

D201002 URINALS

D201002 1.1 FLUSH VALVE URINALS

ASME A112.19.2, white vitreous china, wall-mounted, wall outlet, siphon jet, integral trap, extended side shields. EPA "WaterSense" labeled. Provide large diaphragm (not less than 2.625 inches (66 mm) upper chamber inside diameter at the point where the diaphragm is sealed between the upper and lower chambers) flush valve of chrome plated cast brass conforming to ASTM B 584, including vacuum breaker and angle (control-stop) valve. Maximum flush valve volume per flush shall not exceed 0.5 gallons per flush (1.9 lpf). Provide ASME A112.19.5 trim and ASME 112.6.1M concealed chair carriers. Provide self-closing metering type flush valve, unless electronic flush control is specified in the ESR Section D20. Electronic flush control shall conform to UL 1951 and ASSE 1037.Handicapped fixture mounting height and appurtenances shall be in accordance with the ABA Accessibility Standard.

D201002 1.2 NON WATER USE URINALS

ASME A112.19.2, white vitreous china, wall-mounted, wall outlet, non-water using, integral drain line connection, with sealed replaceable cartridge or integral liquid seal trap insert. The urinal and trap assembly shall maintain a sufficient barrier of a biodegradable immiscible liquid to provide the trap seal and inhibit the backflow of sewer gases. For urinals that use a replaceable cartridge, provide four additional cartridges for each urinal installed. Provide an additional quart of biodegradable liquid for each urinal installed. Provide ASME A112.6.1M concealed chair carriers. Installation and testing shall be in accordance with the manufacturers’ recommendations. Drain lines that connect to the urinal outlet shall not be made of copper tube or pipe. Urinal design and installation shall be ABA Accessibility Standards compliant. Slope the sanitary sewer branch line for non-water use urinals a minimum of 1/4-inch per foot. Manufacturer shall provide an operating manual and on-site training for the proper care and maintenance of the urinal.

D201003 LAVATORIES

D201003 1.1 COUNTERTOP LAVATORIES

Unless integral bowl is specified elsewhere, lavatories shall be white, ASME A112.19.2 vitreous china lavatories with minimum dimensions of 20 inches (508 mm) wide x 18 inches (457 mm) front to rear, and self-rimming type. Provide ASME 112.18.1 copper alloy centerset faucets unless self closing metering or electronic control is specified in ESR section D20. Faucets shall be EPA "WaterSense" labeled. Provide with aerator, adjustable P-traps, and perforated grid strainers, unless pop-up drain fittings are specified in ESR section D20.

D201003 1.2 WALL-MOUNTED LAVATORIES

ASME A112.19.1, white enameled cast-iron or ASME A112.19.2 white vitreous china with ASME A112.6.1M concealed arm carrier support, with minimum

dimensions of 20 inches wide by 18 inches (508 mm wide by 457 mm) front to rear. Provide ASME 112.18.1 copper alloy centerset faucets unless self closing metering or electronic control is specified in ESR section D20. Faucets shall be EPA "WaterSense" labeled. Provide with aerator, adjustable P-traps, and perforated grid strainers, unless pop-up drain fittings are specified in ESR section D20.

D201003 1.3 HANDICAPPED LAVATORIES

Same as Paragraphs 1.1 or 1.2, except height and appurtenances shall be in accordance with ABA Accessibility Standard.

D201004 SINKS

D201004 1.1 COUNTERTOP SINKS

ASME A112.19.3 sink, 20 gage stainless steel with integral mounting rim, minimum dimensions of 33 inches (840 mm) wide for two compartment or 21 inches (560 mm) wide for one compartment by 21 inches (560 mm) front to rear, with ledge back and undersides coated with sound dampening material. Provide top-mounted ASME A112.18.1 copper alloy faucets, swing spout with aerator, and stainless steel drain outlets with cup strainers. Provide adjustable P-trap with drain piping to vertical vent stack. If specified in ESR section D20, provide UL 430 waste disposer unit in right compartment.

D201004 1.2 SERVICE SINKS

ASME A112.19.1, white enameled cast-iron or ASME A112.19.2 white vitreous china, wall mounted and floor supported by wall outlet cast-iron P-trap, minimum dimensions of 22 inches (560 mm) wide by 18 inches (457 mm) front to rear with 9 inch (230 mm) splashback, and stainless steel rim guard. Provide ASME A112.18.1 copper alloy back-mounted combination faucets with vacuum breaker and 0.75 inch (20 mm) external hose threads.

D201004 1.3 MOP SINKS

Pre-cast terrazzo floor-mounted mop sink, 36 inches x 36 inches x 12 inches (914 mm x 914 mm x 305 mm) shall be made of marble chips cast in white Portland cement to a compressive strength of not less than 3625 PSI (25 mPa) 7 days after casting. Provide brass body drains with nickel bronze strainers cast integral with terrazzo. Provide stainless steel rim guard for mop sink. Provide chrome-plated exposed hot and cold water faucets ASME A112.18.1 wall-mounted copper alloy faucets swing spout with 3/4 inch (20 mm) hose connection, vacuum breaker, and pail hook. Provide mop hanger on wall above sink suitable for four mops.

D201004 1.4 LAUNDRY SINKS

IAPMO Z124.6, plastic, two compartment, minimum dimensions of 40 inches wide by 21 inches (1016 mm wide by 533 mm) front to rear, with floor-supported steel mounting frame secured to wall. Provide ASME A112.18.1 copper alloy centerset faucets, swing spout with aerator, and stainless steel drain outlets with cup strainers, and 1.5 inch (40 mm) adjustable P-trap with drain piping to vertical vent stack.

D201005 SHOWERS/TUBS

D201005 1.1 ONE PIECE BATH AND SHOWER MODULES

IAPMO Z124.1.2, made of white fiberglass reinforced plastic (FRP) or acrylic with slip-resistant bathing surfaces, integral grab bar, and three walls integrally molded in one piece. Provide outlet at left or right as necessary to suit module arrangement. Provide pop-up drain fittings and adjustable P-trap. Bathtub and shower supply fittings shall be diverter type with body mounted from behind the wall. Provide tub fill over-rim spout with diverter.

D201005 1.2 SHOWER FLOORS

Precast terrazzo or Acrylic Shower Floors: Terrazzo shall be made of marble chips cast in white Portland cement to produce a compressive strength of not less than 3625 psi (25 MPa) 7 days after casting. Provide brass body drains with nickel bronze strainers cast integral with terrazzo.

D201005 1.3 BATHTUBS

ASME A112.19.1 white enameled cast-iron or porcelain steel bathtubs, recessed type, minimum dimensions of 56 inches (1424 mm) wide by 30 inches (762 mm) front to rear by 16 inches (406 mm) high with drain outlet for above-the-floor drain installation. Bathtub and shower supply fittings shall be diverter type with body mounted from behind the wall. Provide tub over fill rim spout with diverter.

D201005 1.4 SHOWER SUPPLY FITTINGS

ASME A112.18.1, ball joint, self-cleaning, adjustable spray pattern shower heads, connected to concealed pipe connected to copper alloy pressure balance single control type mixing valves with front access integral screwdriver stops. Showerhead shall be EPA "WaterSense" labeled. Anchor the mixing valves and the pipe to each showerhead in wall to prevent movement.

D201005 1.5 HANDHELD SHOWER HEAD

ASSE 1014, adjustable spray hand-held shower head with swivel fitting, 60 inch (1524 mm) minimum flexible chrome plated copper alloy hose and in-line vacuum breaker. Provide push button flow control if specified in ESR section D20. Provide 25 inch (635 mm) grab bar with sliding spray holder that locks at any height.

D201006 DRINKING FOUNTAINS AND COOLERS

D201006 1.1 DRINKING FOUNTAINS

Wall mounted drinking fountain shall be constructed of white enameled cast iron with bubbler and push button control. Handicapped fixture mounting height and appurtenances shall be in accordance with ABA Accessibility Standard.

D201006 1.2 ELECTRIC WATER COOLERS

AHRI 1010, wall-mounted, bubbler style, air-cooled condensing unit, 4.0 gph (4.20 mL per second) minimum capacity, stainless steel splash receptor,

double wall heat exchanger, and all stainless steel cabinet. Provide ASME A112.6.1M concealed wall hangers with thru-bolts and back plates. Handicapped fixture mounting height and appurtenances shall be in accordance with ABA Accessibility Standard.

D201090 EMERGENCY FIXTURES

Pressure-compensated tempering valve is required for emergency fixtures, with leaving water temperature setpoint adjustable throughout the range 60 to 95 degrees F (15.5 and 35 degrees C) unless cold water supply meets temperature criteria.

Where indicated in ESR section D20, provide packaged, UL listed, alarm system; including an amber strobe lamp, horn with externally adjustable loudness and horn silencing switch, mounting hardware, and waterflow switch, assembled and prewired for waterproof service within NEMA Type 3 or 4 enclosures or for explosion proof service within NEMA Type 7 or 9 enclosures.

D201090 1.1 EMERGENCY SHOWER

ISEA Z358.1, wall-mounted self-cleaning, non-clogging 10 inch (250 mm) diameter stainless steel deluge shower head with elbow, one inch (25 mm) full-flow stay-open ball valve with pull rod and 8 inch (200 mm) diameter ring or triangular handle, one inch (25 mm) interconnecting fittings.

D201090 1.2 EMERGENCY EYE & FACE WASH

ISEA Z358.1, wall-mounted self-cleaning, non-clogging eye and face wash with quick opening, full-flow valves, stainless steel eye and face wash receptor. Provide copper alloy control valves.

D201090 1.3 COMBINATION EMERGENCY SHOWER & EYEWASH

ISEA Z358.1, column mounted on a floor flange. Design combination unit so components can be operated individually from a common fixture supply line. Provide a self-cleaning, non-clogging 10 inch (250 mm) diameter stainless steel deluge shower head with elbow, full flow stay-open ball valve with pull rod and 8 inch (200 mm) diameter ring or triangular handle one inch (25 mm) interconnecting fittings. Provide a self-cleaning, non-clogging eye and face wash with quick opening, full-flow valves, stainless steel eye and face wash receptor. Provide copper alloy control valves.

D2020 DOMESTIC WATER DISTRIBUTION

D202001 PIPES & FITTINGS

D202001 1.1 COPPER

Use copper tubing and fittings for pipe sizes 4 inches (100 mm) or smaller. Use type L tubing above ground with solder fittings. For buried piping, use type K tubing with solder fittings.

D202001 1.2 CHLORINATED POLYVINYL CHLORIDE (CPVC)

When specified in ESR section D20, provide CPVC pipe, fittings, and solvent cement per ASTM D 2846/D 2846M for sizes 4 inches (100 mm) and smaller. Provide transition union connections or threaded gate valve between metallic

piping and CPVC piping.

D202002 VALVES & HYDRANTS

D202002 1.1 VALVES

Provide valves at water supplies to fixtures and to provide ease of maintenance as required in the IPC.

D202002 1.2 HOSE BIBBS & HYDRANTS

Use non-freeze wall hydrants where the winter design temperature is at or below freezing. Hose bibbs are acceptable for use elsewhere.

D202002 1.2.1 Hose bibbs

Angle type, copper alloy hose bibbs with vacuum breaker.

D202002 1.2.2 Wall Hydrants

Non-freeze, ASSE 1019, cast bronze, with vacuum breaker, locking shield and tee-handle.

D202003 DOMESTIC WATER EQUIPMENT

D202003 1.1 BACKFLOW PREVENTERS

Furnish proof that each make, model/design, and size of backflow preventer being furnished for the project is approved by and has a current "Certificate of Approval" from the Foundation for Cross-Connection Control and Hydraulic Research (FCCCHR)-USC. Listing of the particular make, model/design, and size in the current FCCCHR-USC will be acceptable as the required proof. Provide freeze protection for aboveground exterior applications in areas where the winter design temperature is at or below freezing.

D202003 1.2 WATER HEATERS

D202003 1.2.1 Electric Water Heaters

Electric water heaters with double heating element per UL 174 for water heaters with less than 120 gallons of storage and 200,000 btuh input. Provide water heater per UL 1453 for commercial water heaters with 120 gallons of storage or more and 200,000 btuh input or more. Water heaters shall be equipped with glass-lined steel tanks, high efficiency type, insulated with polyurethane foam insulation, replaceable anodes, and adjustable range thermostat to allow hot water settings between 110 and 160 degrees F (43 and 71 degrees C). Water heater warranty shall be a minimum of 5 years.

D202003 1.2.2 Gas-Fired Water Heaters

High efficiency storage type water heaters per CSA/AM Z21.10.1 for water heaters with less than 120 gallons of storage and input ratings of 75,000 btuh or less. Provide water heater per CSA/AM Z21.10.3 for commercial water heaters with 120 gallons of storage or more and input ratings above 75,000 btuh. Water heaters shall meet AGA

requirements. Water heaters shall be equipped with glass-lined steel tanks, polyurethane foam insulation, replaceable anodes, and adjustable range thermostat to allow hot water settings between 110 and 160 degrees F (43 and 71 degrees C). Water heater warranty shall be a minimum of 5years. Provide vent in accordance with NFPA 54.

D202003 1.2.3 Oil-Fired Water Heaters

UL 732 oil-fired water heaters with glass-lined steel tanks, high efficiency type, insulated with polyurethane foam insulation, replaceable anodes, with adjustable range thermostat to allow hot water settings between 110 and 160 degrees F (43 and 71 degrees C). Provide vent in accordance with NFPA 58. Oil-fired water heater system design shall be in accordance with NFPA 31.

D202003 1.2.4 Instantaneous Water Heater (Electric)

UL 499, heater(s) shall be of the modulating, under the sink, point-of-use type. Output temperature shall be adjustable from 40 degrees F to 160 degrees F. Heating elements shall be field replaceable. Unit(s) shall have a 10-year warranty.

D202003 1.2.5 Steam Heat Exchangers

Double wall copper tube domestic water heating elements constructed with air gap to atmosphere between the two walls using steam as the heating medium exterior of the heating elements. Provide posted operating instructions for water heaters.

D202003 1.2.6 Storage Tanks

AWWA D100, glass-lined vertical steel tanks, minimum of 125 psig (862 kPa) (gage) working pressure.

D202003 1.3 PUMPS

D202003 1.3.1 Inline Pumps

In-line circulator for service water distribution system. Factory assembled and tested pumps constructed of materials suitable for hot domestic water service.

D202003 1.3.2 Base Mounted Pumps

Potable water service, base mounted, end suction pumps with mechanical seals and drip-proof electric motors.

D202003 1.4 DOMESTIC WATER PRESSURE BOOSTER SYSTEM

Factory assembled, tested, and certified by a single manufacturer who assumes undivided responsibility for the system to include providing start-up services, two days instruction and furnishing related operations and maintenance manuals. Each building shall be provided with its own system. Each system will consist of a minimum of two pumps mounted on a single, welded structural steel base. Provide bladder type low-flow accumulator storage tank, lead-lag pump alternator selector switches and

all related controls and alarms required for safe and proper system operation. Provide variable frequency drive pump operation.

D202003 1.5 EXPANSION TANKS

Steel expansion tank with potable water rated polypropylene or butyl lined diaphragm at water heater.

D202003 1.6 WATER METERS

AWWA C701 turbine type, with register reading in liters and U.S. gallons.

D202004 INSULATION & IDENTIFICATION

D202004 1.1 PIPING INSULATION

Mineral fiber insulation on domestic hot water supply and recirculation piping. Insulate domestic cold water piping with cellular glass insulation (ASTM C 552, Type II, and Type III).

D202004 1.2 PIPING & EQUIPMENT IDENTIFICATION

In addition to the requirements in Section Z10, *General Performance Technical Specification*, provide laminated plastic nameplates for valves. Stop valves in supplies to fixtures will not require nameplates. Identify above ground pipe with the type of service and direction of flow. Letter size, lengths and colors shall be per ANSI A13.1.

D202005 SPECIALTIES

D202005 1.1 WASHING MACHINE CONNECTOR BOX

Recessed wall box fabricated of PVC plastic. Provide bronze dual washing machine valve with single lever shut-off.

D202005 1.2 VALVE BOXES

For each buried valve provide cast-iron, ductile-iron box of a suitable size. Provide cast-iron or ductile-iron cover for the box with the word "WATER" cast on the cover.

D202005 1.3 WATER HAMMER ARRESTORS

PDI WH 201, water hammer arrestors in lieu of air chambers.

D202005 1.4 ICEMAKER CONNECTOR BOX

Recessed wall box fabricated of PVC plastic. Provide bronze shut-off valve.

D202090 OTHER DOMESTIC WATER SUPPLY

D202090 1.1 SUPPORTS

Provide piping supports in accordance with the IPC.

D202090 1.2 INSPECTIONS

Prior to initial operation, inspect piping system for compliance with drawings, specifications, and manufacturer's submittals.

D202090 1.3 DISINFECTION

Upon completion of the installation, disinfect all systems per the IPC.

D202090 1.4 PLUMBING SYSTEMS TESTING

Upon completion of the installation test all systems per the IPC.

D2030 SANITARY WASTE

D203001 WASTE PIPE & FITTINGS

D203001 1.1 PIPING AND FITTINGS

Cast iron hub and spigot pipe and fittings, rubber compression gasket joints or cast-iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where indicated in ESR Section D20, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661 may be provided. Plastic piping shall be equipped with approved firestopping devices as required by code.

D203001 1.2 CLEANOUTS

Provide cleanouts as required by the IPC. Material shall be consistent with the piping system materials.

D203002 VENT PIPE & FITTINGS

Cast-iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where indicated in ESR Section D20, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661. PVC piping shall be equipped with approved firestopping devices as required by code. Single drainage/vent stack systems (such as Philadelphia system) and mechanical air admittance valves are not acceptable.

D203003 FLOOR DRAINS

Floor drains shall be flush strainer or extended rim type as required by the IPC. Provide in mechanical rooms, restrooms, fire pump room, laundry room, and plumbing chase areas. Provide floor sinks in kitchens. Provide floor sinks where required for interior air handling unit condensate drains.

D203004 SANITARY & VENT EQUIPMENT

D203004 1.1 PUMPS

D203004 1.1.1 Submersible Sump Pumps

Factory assembled and tested submersible type pumps for operation under water.

D203004 1.1.2 Sewage Pumps

FS A-A-50555, single or duplex type to meet demand. Duplex types shall be provided with automatic controls to alternate the operation from one pump to the other.

D2040 RAIN WATER DRAINAGE

D204001 PIPE & FITTINGS

Cast iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where indicated in ESR Section D20, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661 may be used. PVC piping shall be equipped with approved firestopping devices as required by code. Size and install piping in accordance with the IPC.

D204002 ROOF DRAINS

Roof drains shall conform to ASME A112.6.4, with dome and integral flange, and shall have a device for making a watertight connection between roofing and flashing.

D204003 RAIN WATER DRAINAGE EQUIPMENT

Where required by building design, provide expansion joint(s) of proper size to receive the conductor pipe. The expansion joint shall consist of a heavy cast-iron housing, brass or bronze sleeve.

D204004 INSULATION & IDENTIFICATION

Mineral fiber insulation on all drainage piping that may be subject to condensation. Provide a vapor retarder. Identify aboveground pipe with the type of service and direction of flow. Letter size, lengths and colors shall be per ANSI A13.1.

D2090 OTHER PLUMBING SYSTEMS

D209001 SPECIAL PIPING SYSTEMS

D209001 1.1 NATURAL GAS PIPING

Conform to requirements of the local natural gas utility and ASME B31.8, *Gas Transmission and Distribution Piping Systems*, for exterior piping. Conform to requirements of NFPA 54, *National Fuel Gas Code*, for interior gas piping. Provide meter and pressure regulator in accordance with the requirements of the local utility. Provide earthquake valve where required by code.

D209002 ACID WASTE SYSTEMS

Acid-resistant DWV pipe, fittings, and couplings with mechanical, bell and spigot, or fusion type joints. Material for buried piping and aboveground piping shall be silicon-iron composition. Borosilicate glass pipe and fitting may be provided for aboveground piping where acid composition dictates, except vent piping through and above roofs shall be silicon-iron composition. Provide cleanouts and drains as specified for DWV piping, except material shall be silicon-iron composition.

D209003 INTERCEPTORS

D209003 1.1 OIL/WATER SEPARATOR

Oil/water separator, where required, in accordance with the IPC and with a minimum flow capacity to meet system demand.

D209003 1.2 GREASE INTERCEPTORS

Provide in accordance with the IPC and PDI G 101.

D209005 COMPRESSED AIR SYSTEM (NON-BREATHING)

D209005 1.1 AIR COMPRESSOR

Factory packaged electric motor driven, duplex air compressor including manufacturer’s standard air filter, oil filter, and plug drain. Air compressor, aftercooler, and receiver shall be factory packaged as a unit. Receiver tank shall be per ASME PBVC Sec. VIII D1, labeled and rated for 125 PSI (862 kPa) gage, equipped with required valves and trimmings, including gage and automatic drain valve and ASME BPVC pressure safety relief valve. Air compressor and receiver shall be sized in accordance with the Compressed Air and Gas Institute (CAGI) guidelines. Locate air compressor away from noise sensitive areas.

D209005 1.2 REFRIGERATED AIR DRYER

Low-pressure compressed air dryer of the mechanical refrigeration type, equipped with an automatic temperature shutdown switch to prevent freezing, a regenerative air-to-air exchanger (as standard with the manufacturer), and a main compressed air cooling exchanger. Refrigeration system shall use non-CFC refrigerant and shall cool compressed air to dry the air. Dryer operating pressure shall be not less than 125 PSI (862 kPa) gage. Dryer size shall be based on system pressure, the entire system air flow, and provide air with a dew point 5 degrees F (-15 degrees C) lower than the most stringent equipment or outlet requirement. The pressure drop of the dryer shall not exceed 2 PSI (13.8 kPa) gage.

D209005 1.3 COMPRESSED AIR PIPING SYSTEM

Piping shall conform to the requirements of ASME B31.1 for materials, assembly, and testing. Piping shall be steel, black seamless schedule 40 carbon steel per ASTM A 53/A 53M with threaded fittings or copper tubing per ASTM B 88, Type K or Type L, hard drawn, Class 1, with wrought copper or bronze fittings. Provide compressed air drops in locations to facilitate work required with quick disconnects throughout the work areas to allow connection of such as pneumatic tools and air guns. Each air drop shall be equipped with a filter/moisture separator, pressure gauge, air pressure regulator, and a quick-disconnect.

-- End of Section --

SECTION D30

HVAC
09/15

D30 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

D30 1.1 NARRATIVE

This section includes the construction of interior mechanical systems. This section covers installations inside the facility and out to the five foot line. See Section G30, *Site Civil/Mechanical Utilities*, for continuation of systems beyond the five-foot line.

D30 1.2 MECHANICAL DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

D30 1.2.1 Government Standards

Federal Energy Management Program (FEMP)

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-401-01, Mechanical EngineeringUFC 3-420-01, Plumbing Systems)
UFC 1-200-02	High Performance and Sustainable Buildings
UFC 3-440-01	Facility-Scale Renewable Energy Systems

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 01 78 24.00 20	Electronic Facility Operation and Maintenance Support Information
UFGS 23 05 93	Testing, Adjusting, and Balancing for HVAC
UFGS 23 09 23.13 20	BACNET Direct Digital Control Systems for HVAC
UFGS 23 81 23.00 20	Computer Room Air Conditioning Units

D30 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

a. Verification of satisfactory HVAC system performance shall be via Performance Verification Testing, as detailed in this section.
b. The Government reserves the right to witness all Acceptance Tests and Inspections, review data, and request other such additional inspections and repeat tests as necessary to ensure that the system and provided services conform to the stated requirements.
c. The Qualified Testing Organization shall provide the Acceptance Tests and Inspections test plan and perform the acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with appropriate standards, and the manufacturer's recommendations. Equipment shall be placed in service only after completion of required tests and evaluation of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing. Perform acceptance tests and inspections on Computer Room Air Conditioning Units, Direct Digital Control System, and HVAC Testing/Adjusting/Balancing.

D30 1.4 HVAC COMMISSIONING

Commission the HVAC systems per the Commissioning Plan as required by UFGS Specification Section 01 45 00.05 20, *Design & Construction Quality Control*. HVAC system commissioning shall coordinate with and incorporate the testing, reporting, training & O&M documentation requirements of UFGS 23 05 93, *Testing, Adjusting, and Balancing for HVAC*and UFGS 23 09 23.13 20, *BACnet Direct Digital Control Systems for HVAC*.

D30 1.5 DESIGN SUBMITTALS

Design Submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, and UFC 3-401-01, *Mechanical Engineering*.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR shall edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance

with the limitations stated in PTS section Z10, *General Performance Technical Specifications*.

UFGS 01 78 24.00 20, *ElectronicFacility Operation and Maintenance Support Information*

UFGS 23 09 23.13 20, *BACnet Direct Digital Control Systems for HVAC*

UFGS 23 05 93, *Testing, Adjusting, and Balancing for HVAC*

UFGS 48 14 13.00 20, *Solar Liquid Flat Plate Collectors*

D30 1.6 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

Solar hot water heating system fixtures and equipment, and OMSI information for all equipment and fixtures.

D30 1.7 MOTORS

Single-phase fractional-horsepower alternating-current motors shall be high efficiency types corresponding to the applications listed in NEMA MG 11. Select polyphase motors based on high efficiency characteristics relative to the applications as listed in NEMA MG 10. Additionally, all polyphase squirrel-cage medium induction motors with continuous ratings shall meet or exceed energy efficient ratings per Table 12-10 of NEMA MG 1. Provide controllers for 3-phase motors rated 1 hp (0.75 kW) and above with phase voltage monitors designed to protect motors from phase loss and over/under-voltage. Provide means to prevent automatic restart by a time adjustable restart relay. For packaged equipment, the manufacturer shall provide controllers including the required monitors and timed restart. Provide reduced voltage starters for all motors 25 hp and larger.

D3010 ENERGY SUPPLY

D301001 OIL SUPPLY SYSTEM

Conform to requirements of International Mechanical Code for piping. Conform to requirements of NFPA 31 for testing. Contractor is responsible for providing the complete oil supply system to the facility, including any applications and permits.

D301001 1.1 OIL SUPPLY SYSTEM PIPING & EQUIPMENT

ASTM A 53/A 53M or ASTM A 106/A 106M piping with associated ASME fittings or ASTM B 88, type L or M copper tubing with ASME B16.26 flared fittings or compression type fittings. Provide welded fittings on piping below grade. Pumps that are not part of the burner assembly shall be positive displacement type. Provide oil filter prior to oil entering appliance or pump. Storage tanks shall meet the requirements of NFPA 31.

D301002 GAS SUPPLY SYSTEM

D301002 1.1 NATURAL GAS PIPING

Conform to requirements of the local natural gas utility and ASME B31.8, *Gas Transmission and Distribution Piping Systems*, for exterior piping. Conform to requirements of NFPA 54, *National Fuel Gas Code*, for interior gas piping. Provide meter and pressure regulator in accordance with the requirements of the local utility. Provide earthquake valve where required by code. Contractor is responsible for providing the complete natural gas system to the facility, including any applications and permits.

D301002 1.2 MATERIALS AND EQUIPMENT

D301002 1.2.1 Aboveground Within Buildings

Black steel per ASTM A 53/A 53M, Schedule 40, and associated ASME fittings threaded ends for sizes 2 inches (50 mm) and smaller; otherwise, plain end beveled for butt welding.

D301002 1.3 PRESSURE TESTS

Pressure test per NFPA 54 at 1.5 times maximum working pressure, but in no case less than 50 PSI (350 kPa).

D301002 1.4 PROPANE PIPING

If required, provide the same as specified for natural gas and comply with NFPA 58.

D301002 1.4.1 Underground

Polyethylene (PE) pipe conforming to ASTM D 2513 for 100 PSI (690 kPa) (gage) working pressure. Standard Dimension Ratio shall be 11.5 maximum. Provide detectable aluminum plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of direct buried piping. Tape shall be detectable by an electronic detection instrument. Warning tape to be color coded with warning and identification of utility type imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (utility type) LINE BELOW" or similar wording. Color to be yellow for gas lines. Polyethylene Fittings shall be ASTM D 2683 socket fittings or ASTM D 2513 molded butt-fusion fittings.

D301002 1.5 PROPANE TANKS

If not provided by the propane provider, the tank material and installation shall comply with NFPA 58.

D301003 STEAM SUPPLY SYSTEM (FROM CENTRAL PLANT)

Refer to Section G30, *Site Civil/Mechanical Utilities*

D301004 HOT WATER SUPPLY SYSTEM (FROM CENTRAL PLANT)

Refer to Section G30, *Site Civil/Mechanical Utilities*

D301005 SOLAR ENERGY SUPPLY SYSTEM

Design and build each solar domestic hot water heating system meeting the requirements of UFC 3-440-01 *Facility-Scale Renewable Energy Systems*. Each system shall be fully integrated with the building DDC controls system.

Provide complete solar domestic hot water system designed and built by a single contractor who specializes in solar heated water systems. System shall be designed, built, and tested by this contractor who shall be responsible for the provided system to operate as proposed. This design-build contractor must be endorsed in writing, prior to system design, by the manufacturer of the solar plate collectors provided for this solicitation.

The solar domestic hot water system designer shall work with the building designers to optimize the roof area, slope and orientation available for solar domestic hot water. Coordinate with other solar systems utilizing the roof area such as photovoltaic systems.

Provide solar liquid flat plate collector systems to comply with the requirements specified in UFGS Section 48 14 13.00 20, *Solar Liquid Flat Plate Collectors.*

D3020 HEAT GENERATING SYSTEMS

D302001 BOILERS

If required, provide Boiler(s) type for the load capacity of the building as indicated in ESR Section D30.

D302001 1.1 REQUIREMENTS

Boiler shall be designed, tested, and installed per ASME CSD-1 (Controls and Safety Devices) and ASME BPVC (Boiler and Pressure Vessel Code). The boiler shall meet the requirements of the UL 795, ANSI Z83.3, and ASME CSD. Oil-fired boiler system design shall be in accordance with NFPA 31.

D302001 1.2 BOILER BURNER

Burners provided shall be the make, model and type certified and approved by the manufacturer of the boiler being provided. Burner controls and flame safety equipment shall conform to either ASME CSD-1 or NFPA 58 as dictated by the input.

D302001 1.3 BOILER TRIM AND CONTROL EQUIPMENT

D302001 1.3.1 Boiler Controls

Mount controls, including operating switches, indicating lights, gages, alarms, motor starters, fuses, and circuit elements of the control systems, on a single control panel mounted on the burner or separate from the burner. Location of the separate panel shall be at the side of the boiler or in a freestanding control cabinet away from the front of the boiler. When using BACnet communication protocol, use the ASHRAE 135 protocol without gateways to interface with the BACnet Direct Digital Control System in specification UFGS

23 09 23.13 20.

D302001 1.3.2 Boiler Trim

Comply with ASME BPVC SEC IV, ASME CSD-1, and additional appurtenances as specified herein.

D302001 1.3.3 Pressure Gages

Provide pressure gages with a scale equivalent to 1.5 times the outlet water pressure on supply water piping and return water piping.

D302001 1.3.4 Thermometers

Provide thermometers with a scale equivalent to 1.5 times the outlet water temperature on supply water piping and return water piping.

D302001 1.3.5 Drain Trapping

Provide drain valve and piping to a floor drain.

D302001 1.3.6 Air Vent Valve

Provide with screwed connection, stainless steel disk, and stainless steel seats to vent entrapped air.

D302001 1.4 STEAM BOILERS

Steam boilers shall meet the requirements of hot water boilers, except as follows.

D302001 1.4.1 Pressure Gages

Provide pressure gages with a scale equivalent to 1.5 times the outlet water pressure on boiler feedwater supply piping and condensate return water piping. Provide boiler steam pressure gage with scale equivalent to 1.5 times the boiler rated working pressure.

D302001 1.4.2 Thermometers

Provide thermometers with a scale equivalent to 1.5 times the outlet water temperature on boiler feedwater piping and return water piping.

D302001 1.5 BOILER STACK AND ACCESSORIES

Provide pre-manufactured, multi-wall stacks complying with NFPA 54 or NFPA 58 and UL-listed. Provide flue gas thermometer and mount in flue gas outlet.

D302001 1.6 BOILER STARTUP AND OPERATIONAL TESTS

D302001 1.6.1 Boiler Cleaning

Prior to startup, clean boiler(s) in accordance with ASME *Boiler and Pressure Vessel Code*and manufacturer's recommendations.

D302001 1.6.2 Operational Tests

Furnish the services of an engineer or technician approved by the boiler manufacturer for installation, startup, operational and safety testing. Demonstrate proper operability of combustion control, flame safeguard control, and safety interlocks.

D302003 FUEL-FIRED UNIT HEATERS

D302003 1.1 GAS-FIRED UNIT HEATERS

ANSI Z83.8 and AGA label. Equip each heater with individually adjustable package discharge louver. Provide with thermostat.

D302003 1.2 INFRARED HEATERS

ANSI Z83.8 and AGA label.

D302004 AUXILIARY EQUIPMENT

D302004 1.1 HEAT EXCHANGERS

Steam to hot water converter as required for the application. Provide factory assembled, u-tube units constructed in accordance with ASME BPVC for steam or hot water. Factory assembled, plate type heat exchangers may be provided for hot water.

D302004 1.2 CONDENSATE RETURN UNITS

Floor-mounted receiver and duplex pump unit.

D302005 EQUIPMENT THERMAL INSULATION

Insulate hot water pumps and equipment as suitable for the temperature and service in rigid block, semi-rigid board, or flexible unicellular insulation to fit as closely as possible to equipment.

D3030 COOLING GENERATING SYSTEMS

If coatings are indicated in ESR Section D30, provide with copper tube/copper fin construction or immersion applied, baked phenolic or other approved coating that passes the 3000 hour salt spray resistance test using the ASTM B117 procedure. Field applied coatings are not acceptable.

D303001 CHILLED WATER SYSTEMS

D303001 1.1 AIR-COOLED CHILLERS

Air-cooled chillers shall be type indicated in Project Program and meet the requirements of AHRI 550/590. Provide control panel with the manufacturers' standard controls and protection circuits. If DDC system is required in project, provide a control interface for remote monitoring of the chiller's operating parameters, functions and alarms from the DDC control system central workstation. When using BACnet communication protocol, use the ASHRAE 135 protocol without gateways to interface with the BACnet DDC system in specification UFGS 23 09 13.13 20.

D303001 1.1.1 Stages

Provide continuous variable speed compressor adjustment to match actual load, or minimum of four stages of unloading at 25% per stage minimum for reciprocating, centrifugal, and scroll chillers. Provide reciprocating units with hot gas bypass.

D303001 1.1.2 Pressure Control

Provide head pressure control for cold temperature operation. Provide freeze protection for chiller and piping.

D303001 1.1.3 Coil Construction

Provide copper tube, aluminum fins for condenser coils. Provide manufacturer's optional louvered covers or hail guards for condenser coils to provide protection against vandalism, debris, or hail.

D303001 1.2 WATER-COOLED CHILLERS

Self-contained chiller meeting the requirements of AHRI 550/590. Provide control panel with the manufacturers' standard controls and protection circuits. If DDC system is required in project, provide a control interface for remote monitoring of the chiller's operating parameters, functions and alarms from the DDC control system central workstation. Provide automatic capacity-reduction system for stable operation from 100 to 10 percent of full load capacity. When using BACnet protocol, use the ASHRAE 135 protocol without gateways to interface with the BACnet DDC system in specification 23 09 23.13 20.

D303001 1.3 COOLING TOWERS

Factory assembled, conforming to NFPA 214. Fire hazard rating for plastic impregnated materials shall not exceed 25. Provide Cooling Technology Institute 201 certification of tower capability and performance. Cooling Tower performance shall meet or exceed that listed in ASHRAE 90.1. Construct as indicated in ESR Section D30 with fill material of PVC formed sheets. Provide stainless steel hardware. Provide vibration cutout switch interlocked with the fan motor. Provide 2-speed or adjustable frequency drive fan motors. Provide work platform(s) at all locations in the tower that require periodic maintenance. For multi-cell installations, provide isolation valves on inlets and outlets of each cell.

D303001 1.4 CLOSED CIRCUIT COOLERS

Factory assembled, conforming to NFPA 214. Fire hazard rating for plastic impregnated materials shall not exceed 25. Provide Cooling Technology Institute 201 certification of tower capability and performance. Cooler performance shall meet or exceed that listed in ASHRAE 90.1. Provide stainless steel hardware. Provide vibration cutout switch interlocked with the fan motor. Provide 2-speed or adjustable frequency drive fan motors. Meet OSHA safety requirements for stairs and handrails.

D303002 DIRECT EXPANSION SYSTEMS

If coatings are indicated in ESR Section D30, provide with copper tube/copper fin

construction or immersion applied, baked phenolic or other approved coating that passes the 3000 hour salt spray resistance test using the ASTM B117 procedure. Field applied coatings are not acceptable.

D303002 1.1 HEAT PUMPS

D303002 1.1.1 Air to Air

Air-cooled, split system heat pumps with ducted air distribution. Provide units factory assembled, designed, tested, and rated in accordance with AHRI 210/240 or AHRI 340/360. Provide manufacturer's minimum recommended clearance around condensing units. Refrigerant piping size shall be per the manufacturer's recommendations. Insulate refrigerant piping suction lines and condensate drain.

D303002 1.1.2 Water Source

Factory assembled, designed, tested, and rated in accordance with AHRI/ISO 13256-1 or AHRI/ISO 13256-2. Unit shall be AHRI/ISO 13256-1 or AHRI/ISO 13256-2 certified, or listed in the AHRI/ISO 13256-1 or AHRI/ISO 13256-2 directory.

D303002 1.1.3 Ground-Coupled

Factory assembled, designed, tested, and rated in accordance with AHRI/ISO 13256-1 or AHRI/ISO 13256-2. Unit shall be AHRI/ISO 13256-1 or AHRI/ISO 13256-2 certified, or listed in the AHRI/ISO 13256-1 or AHRI/ISO 13256-2 directory. Ground-coupled heat pumps shall be connected to the heat exchanger by a closed loop ground source vertical well field. Design and installation of each well field shall comply with IGSHPA and ASHRAE Standards.

D303002 1.2 CONDENSING UNITS

Air-cooled, split system air conditioner with ducted air distribution. Provide units factory assembled, designed, tested, and rated in accordance with AHRI 210/240 or AHRI 340/360. Provide manufacturer's minimum recommended clearance around condensing units. Refrigerant piping size shall be per the manufacturer's recommendations.

D303002 1.3 DX VARIABLE AIR VOLUME (VAV) UNITS

Direct expansion equipment shall be specifically designed and manufactured for VAV applications. The same manufacturer shall provide central air handling units, VAV boxes/zone dampers and zone controls. Airflow through the evaporator coils shall not be modulated. Provide duct mounted zone control damper units with integral control box, designed for use with DX VAV packaged systems. Self-modulating air diffusers will not be allowed.

D303002 1.4 DUCTLESS SPLIT SYSTEM

Air-cooled, ductless split system. Provide units factory assembled, designed, tested, and rated in accordance with ARI 210/240. Provide manufacturer's minimum recommended clearance around heat pump or condensing units. Refrigerant piping size shall be per the manufacturer's recommendations. Insulate refrigerant piping suction lines and condensate

drain.

D303002 1.5 VARIABLE REFRIGERANT FLOW SYSTEMS

The system shall consist of VRF heat pump units, branch circuit controllers, VRF fan coil units, and associated controls. The heat pump units shall be inverter driven and shall utilize R410A refrigerant. The branch circuit controllers shall include multiple branch connections allowing for simultaneous heating and cooling utilizing hot gas refrigerant or sub-cooled liquid. The total capacity of the branch controllers shall be between 50% and 150% of the rated capacity.

All refrigerant piping shall be sized and installed in strict compliance with the manufacturer's requirements. Refrigerant piping shall be clean, dry, and leak free. Prior to installation all refrigerant pipes shall remain sealed. During installation and prior to filling, nitrogen shall be used to maintain cleanliness and prevent oxidation and scaling while brazing. Each system shall be installed to provide proper oil return. Refrigerant piping shall be copper, ACR type, ASTM B280. All joints shall be sil-brazed. All thicknesses of piping shall remain the same throughout the system. Each refrigerant circuit shall be individually pressure tested and commissioned. Pressure testing shall be performed using nitrogen at 1-1/2 times the system operating pressure. Each system shall be designed to meet Refrigerant Piping and Heat Transfer Components ASME B31.9, Building Services Piping Code and shall be designed to allow for expansion and contraction.

D3040 DISTRIBUTION SYSTEMS

D304001 AIR DISTRIBUTION, HEATING & COOLING

D304001 1.1 DUCTWORK

Except as specified herein, provide ductwork constructed, braced, reinforced, installed, supported, and sealed per SMACNA standards.

D304001 1.1.1 Flexible Ducts

Use insulated flexible duct only for connections to air distribution devices to adapt to minor offsets. Flexible duct shall be UL 181 listed and per SMACNA 1966 duct construction standards with a minimum R value of 4. Maximum length of flexible ductwork shall be 5 feet (1.5 meters).

D304001 1.1.2 Flexible Connections

Provide flexible connectors between fans and ducts.

D304001 1.1.3 Volume Dampers

Provide manual volume dampers in each branch take-off from the main duct to control air quantity except for primary supply ductwork on VAV systems. Dampers shall conform to SMACNA 1966 duct construction standards and shall be seal class "A" construction.

D304001 1.1.4 Fire Dampers

Fire dampers shall be rated per UL 555. Fire dampers shall be dynamic type rated for closure against a moving airstream. Provide fire dampers that do not intrude into the air stream when in the open position.

D304001 1.1.5 Smoke Dampers

Smoke dampers shall be rated per UL 555S.

D304001 1.1.6 Sound Attenuators

Fabricated attenuators that will reduce the rated sound pressure level of the fan down to at least 65 decibels in the 250 Hz (third octave band) center frequency by using a reference sound source calibrated in decibels of sound power at 10 to 12 watts. Maximum permissible pressure drop shall not exceed 0.63 inch of water (157 Pa).

D304001 1.2 LOUVERS & HOODS

D304001 1.2.1 Louvers

Louvers shall bear AMCA ratings seal for air performance and water penetration in accordance with AMCA 500L and AMCA 511. Louvers shall be constructed of anodized aluminum alloy or stainless steel. Provide birdscreens.

D304001 1.2.2 Hoods

Hoods shall be constructed of anodized aluminum alloy or stainless steel. Provide with birdscreens.

D304001 1.3 GRILLES, REGISTERS, & DIFFUSERS

Factory-finished grilles, registers, and diffusers. Exterior and exposed edges shall be rolled, or otherwise stiffened and rounded.

D304001 1.4 INSULATION

Provide external thermal insulation for all ductwork. Insulate ductwork in concealed spaces with blanket flexible mineral fiber. Insulate ductwork in Mechanical Rooms and exposed locations with rigid mineral fiber insulation.

Provide insulation with factory applied all-purpose jacket with integral vapor retarder. In exposed locations, provide a jacket with white surface suitable for painting. Flame spread/smoke developed rating for all insulation shall not exceed 25/50. Minimum insulation thickness shall be the minimum thickness required by ASHRAE 90.1. Insulate the backs of all supply air diffusers with blanket flexible mineral fiber insulation.

D304001 1.5 VAV BOXES

Pressure-independent type variable air volume units rated per AHRI 880. Boxes shall not be allowed to fully shut-off. Provide each box with a heating coil unless not required by space reheat or heating. Provide electronic

controls.

D304001 1.6 VARIABLE AIR VOLUME VAV FAN-POWERED UNITS

Pressure-independent, fan powered, VAV units rated per AHRI 880 and UL listed. Provide each box with a heating coil. Provide electronic controls with speed controller, discharge volume control damper(s), and return/recirculation air frame and filter. If discharge dampers are not provided with the unit, coordinate installation with the sheet metal contractor. Insulate in accordance with ASHRAE 90.1.

D304002 STEAM DISTRIBUTION SYSTEMS

D304002 1.1 STEAM PIPING

Steam piping shall be ASTM A 106/A 106M or ASTM A 53/A 53M Grade B, Schedule 40, black steel, electric-resistance welded or seamless.

D304002 1.2 CONDENSATE RETURN PIPING

Condensate return piping shall be ASTM A 106/A 106M or ASTM A 53/A 53M, Grade B, Schedule 80, black steel, electric-resistance welded or seamless.

D304002 1.3 STEEL PIPE FITTINGS

For piping 2 inch (50 mm) and smaller, provide ASME B16.3 malleable iron screwed fittings or ASME B16.11 socket welding (Class 3000) or threaded type (Class 2000). Provide ASME B16.9 butt-welding fittings or ASME B16.5 flanged type for piping 2-1/2 inch (63 mm) and larger.

D304002 1.4 INSULATION

Insulate steam and condensate return piping with mineral fiber or cellular glass insulation with all-purpose jacket.

D304002 1.5 STEAM PRESSURE REDUCING STATION

For each building, provide steam pressure reducing station(s).

D304002 1.6 STEAM TRAPS

Provide steam traps and accessories in accordance with UFC 3-401-01.

D304003 HOT WATER DISTRIBUTION SYSTEMS

D304003 1.1 HOT WATER PIPING

Hot water piping shall be electric resistance welded or seamless Schedule 40 black steel pipe conforming to ASTM A 53/A 53M. Piping 4 inch (100 mm) and smaller may be ASTM B 88 Type K or L copper.

D304003 1.2 STEEL PIPE FITTINGS

For piping 2 inch (50 mm) and smaller, provide ASME B16.3 malleable iron screwed fittings or ASME B16.11 socket welding (Class 3000) or threaded type (Class 2000). Provide ASME B16.9 butt-welding fittings or ASME B16.5

flanged type for piping 2-1/2 inch (63 mm) and larger.

D304003 1.3 COPPER FITTINGS

ASME B16.18 cast bronze solder joint type or ASME B16.22 wrought copper solder joint type.

D304003 1.4 ISOLATION VALVES

Provide isolation valves on supply and return lines at take-offs for service to each building(s). Valves shall be located in valve boxes.

D304003 1.5 INSULATION

Insulate hot water piping with mineral fiber insulation with factory-applied all-purpose jacket. Provide aluminum metal wrap over insulation for all exterior piping.

D304003 1.6 VALVES

Provide shut off valves, appropriately sized relief valves, and appropriately sized balancing valves as necessary to balance water flows, protect components and isolate equipment for service and repairs.

D304003 1.7 APPURTENANCES

Provide appurtenances such as air separators, expansion tanks, suction diffusers, strainers, and other required features to allow for proper operation of hot water systems.

D304003 1.8 TEST PORTS

Provide test ports in piping at inlet and outlet of all major system components including boilers, pumps, and other equipment as required.

D304004 CHANGEOVER DISTRIBUTION SYSTEMS

Provide as specified for Hot Water Distribution Systems see D304003.

D304005 GLYCOL DISTRIBUTION SYSTEMS

Provide as specified for Chilled Water Distribution Systems see D304006.

D304006 CHILLED / CONDENSER WATER DISTRIBUTION SYSTEMS

D304006 1.1 ABOVEGROUND CHILLED AND CONDENSER WATER PIPING

Aboveground chilled water piping shall be electric resistance welded or seamless Schedule 40 black steel pipe conforming to ASTM A 53/A 53M. Piping 4 inch (100 mm) and smaller may be ASTM B 88 Type K or L copper.

D304006 1.2 STEEL PIPE FITTINGS

For piping 2 inch (50 mm) and smaller, provide ASME B16.3 malleable iron screwed fittings or ASME B16.11 socket welding (Class 3000) or threaded type (Class 2000). Provide ASME B16.9 butt-welding fittings or ASME B16.5

flanged type for piping 2-1/2 inch (63 mm) and larger.

D304006 1.3 COPPER FITTINGS

ASME B16.18 cast bronze solder joint type or ASME B16.22 wrought copper solder joint type.

D304006 1.4 ISOLATION VALVES

Provide isolation valves on supply and return lines at take-offs for service to each building(s). Valves shall be located in valve boxes.

D304006 1.5 INSULATION

Insulate chilled water pumps and accessories for the temperature and service in rigid block, semi-rigid board, or flexible unicellular insulation to fit as closely as possible to equipment. Insulate above ground chilled water piping with cellular glass insulation (ASTM C 552, Type II, and Type III). Flexible unicellular insulation may be used on small piping runouts. Insulate condenser water piping with mineral fiber insulation. Provide all-purpose jacket with vapor retarder. Provide aluminum metal wrap over insulation for all exterior piping.

D304006 1.6 VALVES

Provide shut off valves, appropriately sized relief valves, and appropriately sized balancing valves as necessary to balance water flows, protect components and isolate equipment for service and repairs.

D304006 1.7 TEST PORTS

Provide test ports in piping at inlet and outlet of all major system components including chillers, pumps, and other equipment as required.

D304007 EXHAUST SYSTEMS

D304007 1.1 FANS

Fans shall be AMCA 210 certified, with AMCA seal. Fan bearings shall have a minimum average life of 200,000 hours at design operating conditions. Provide bird screens for outdoor inlets and outlets. Provide direct-drive type fans with means for verifying operation via the building DDC system or with speed controllers

D304007 1.2 IN-LINE FANS

UL-Listed centrifugal fans.

D304007 1.3 WALL FANS

Propeller fans with fan guards. Provide centrifugal fans with backdraft dampers and wall bracket.

D304007 1.4 ROOFTOP FANS

UL-Listed centrifugal fans with roof curb.

D304007 1.5 UTILITY SETS

AMCA 210 with AMCA seal.

D304007 1.6 BATHROOM FANS

UL 507 and UL-listed, Home Ventilating Institute (HVI) certified and with AMCA seal for ceiling installation.

D304007 1.7 RANGE HOODS

UL 507 and UL-listed, with AMCA seal, range hood with light over stove. Minimum fan capacity shall be 160 cfm with maximum sound level of 5.6 sones.

D304008 AIR HANDLING UNITS

AMCA 210 certified fans with AMCA seal. Fan bearings shall have a minimum average life of 200,000 hours at design operating conditions. Provide bird screens for outdoor inlets and outlets.

D304008 1.1 CENTRAL STATION AIR HANDLERS

Modular construction, double wall air handling units with minimum of 1 inch (25 mm) casing insulation. Provide AHRI 430 certified fans and AHRI certified coils. Provide stainless steel, positive draining condensate drain pan. For 100% outside air units provide capability for cooling, heating, dehumidification and reheat.

D304008 1.1.1 Ultraviolet Disinfection System

For central station air handling units provide an ultra violet c-band (UVC) disinfection system for mold, bacteria and odor control in each air handler that has a chilled water or DX cooling coil. Irradiation-emitters and fixtures are to be installed in sufficient quantity and in such an arrangement so as to provide an equal distribution of UVC energy on the coil and in the drain pan. To maintain energy efficiency, the UVC energy produced shall be of the lowest possible reflected and shadowed losses. Energy Efficiency - Power supplies shall be of the high efficiency electronic type and matched to the emitter. Intensity - The minimal UVC energy striking the leading edge (if installed upstream) or trailing edge (if installed downstream) of all the coil fins shall not be less than 820 ÂµW/cm2 at the closest point and through placement, not less than 60% of that value at the farthest point. Equal amounts are to strike the drain pan, either directly or indirectly through reflection. The foregoing sets the placement and minimum quantity of fixtures to be installed. Installation - emitters and fixtures shall be installed at right angles to the conforming lines of the coil fins, such that through incident angle reflection, UVC energy bathes all surfaces of the coil and drain pan as well as all of the available line of sight airstream. One complete set of spare bulbs will be supplied.

D304090 OTHER DISTRIBUTION SYSTEMS

D304090 1.1 PUMPS

Centrifugal circulating pumps with motor, motor starter, and motor enclosure conforming to the appropriate NEMA standards. Provide suction diffusers on base-mounted pumps. Insulate pumps used for hot service and chilled water service.

D304090 1.1.1 In-Line Pumps

Pumps constructed of manufacturer's standard materials suitable for chilled, condenser, and hot water heating systems.

D304090 1.1.2 Base Mounted Pumps

Single stage end suction pumps suitable for chilled, condenser, and hot water heating systems.

D304090 1.2 VARIABLE FREQUENCY DRIVES (VFD)

Factory-assembled variable frequency drive control systems for variable speed control. All air handling unit and pump VFD's shall be from the same manufacturer. Each VFD shall include motor starter, motor disconnects and controls as required for a complete system. Units shall be UL-listed and comply with the National Electric Code.

Provide the following accessories:

Disconnect switch

Control circuit transformer, with primary and secondary fuses

Manual bypass

System hand-off-auto switch with provisions for remote start/stop of the system.

System initialized light

Run light

Failure alarm

LCD digital display with numeric keypad

Provide a control interface for remote monitoring of VFD functions and alarms from the DDC control system computer.

D304090 1.3 AIR SEPARATORS

ASME rated air separators with tangential inlet and outlet connections and automatic air vent.

D304090 1.4 SOLIDS SEPARATORS

Provide centrifugal solids separator with automatic drain in open systems.

D304090 1.5 EXPANSION TANKS

ASME rated expansion tanks with polypropylene or butyl diaphragm or compression tanks as indicated in UFC 3-401-01.

D304090 1.6 MAKE-UP WATER STATION

Station shall consist of a water pressure-reducing valve and a relief valve in the make-up water line to the chilled and hot water systems to maintain the operating pressure. Provide a 3/4 inch (20 mm) globe valve by-pass around this pressure reducing station. Provide reduced pressure backflow preventer upstream of the by-pass.

D304090 1.7 GLYCOL MAKE-UP STATION

If required, provide a glycol makeup system to maintain system proper operating mixture.

D304090 1.8 CONDENSATE DRAIN PIPING

ASTM B 88, Type M or L, hard drawn copper.

D304090 1.9 CONDENSATE DRAIN INSULATION

Insulate condensate drain piping with flexible cellular insulation.

D304090 1.10 CHEMICAL TREATMENT

If required, Provide chilled and hot water systems with automatic chemical treatment system for the control of pH, scale formation, and corrosion inhibition. Provide shot-type feeders for manual chemical feed. Feeders shall be rated for use with pressures up to 130 PSI (900 kPa) (gage). Provide condenser water systems with automatic chemical treatment systems that monitor conductivity, and pH, and provide for water metering and bleed-off. Provide chemicals in accordance with EPA and equipment manufacturer’s recommendations.

D304090 1.11 PIPING IDENTIFICATION

Provide piping identification labels or Stencil names or code letters for piping systems in clearly visible letters and symbols. Provide arrow-shaped markings to indicate direction of flow.

D304090 1.12 PIPE SLEEVES

Provide pipe sleeves at each wall and floor penetration. The sleeve shall be of a material suitable to protect the carrier pipe (two pipe sizes larger) and sealed with an appropriate flexible material. Provide fire stopping in fire rated walls in accordance with IBC.

D304090 1.13 SYSTEM FLUSHING

Thoroughly flush hydronic systems prior to system startup. Isolate coils during initial flushing until water is clear.

D304090 1.14 HEAT TAPE

UL-Listed, self-regulating, heat tape on piping subject to freezing.

D3050 TERMINAL & PACKAGE UNITS

D305002 UNIT HEATERS

See D302004 for gas fired unit heaters.

D305002 1.1 STEAM

UL-Listed, factory assembled, unit heaters.

D305002 1.2 HOT WATER

UL-Listed, factory assembled, unit heaters.

D305002 1.3 CABINET UNIT HEATER

UL-Listed, factory assembled, heaters.

D305003 FAN COIL UNITS

UL-Listed, factory assembled and tested fan coils, AHRI 440 and AHRI certified.

D305004 FIN TUBE RADIATION

D305004 1.1 FIN TUBE RADIATORS AND CONVECTORS

Fin tube radiators and Convectors shall be provided with copper tubes and aluminum fins. Provide normally open, spring return control valves.

D305005 ELECTRIC HEATING

D305005 1.1 UNIT HEATERS

Factory assembled, UL-1025, unit heaters.

D305005 1.2 BASEBOARD HEATERS

Factory assembled, UL-1042, heaters.

D305005 1.3 WALL HEATERS

Factory assembled, UL-1025, cabinet heaters.

D305005 1.4 INFRARED HEATERS

Factory assembled, UL-Listed and labeled heaters.

D305006 PACKAGE UNITS

D305006 1.1 ROOFTOP AIR HANDLERS

Factory packaged units in accordance with AHRI 430 and suitable for outdoor installation. Provide with manufacturer's roof curb.

D305006 1.2 DUCT HEATER

Factory assembled, UL-listed heaters. Provide control cabinet and heating coil.

D3060 CONTROLS AND INSTRUMENTATION

D306001 HVAC CONTROLS

D306001 1.1 DIRECT DIGITAL CONTROLS

Provide one of the following as directed in ESR Section D30.

a. Provide Direct Digital Controls (DDC) to comply with the requirements specified in UFGS Section 23 09 23.13 20, *BACNET Direct Digital Control Systems for HVAC*.
b. Provide a partial direct digital control (DDC) system to that will communicate with the existing DDC system. If using BACnet protocol, comply with the requirements specified in UFGS Section 23 09 23.13 20, *BACnet Direct Digital Control Systems for HVAC.* Notwithstanding any other provisions of this contract, no other product will be acceptable other than that indicated in ESR Section D30. Provide a distributed control system. Integrate all new DDC points on the existing server providing a seamless logical flow from the existing facilities to the new integrated facility.

The Designer of Record shall use UFGS Section 23 09 23.13 20 if using BACnet protocol, and submit the edited specification section as a part of the project design submittal.

Design requirements shall be in accordance with all specification notes and the BAS Owner shall be identified and designated early in the design documentation.

The system shall have stand alone digital controllers, a communication network, and a workstation computer with control software. Provide stand-alone control routines that operate without connection to the network during a loss of communication. Provide trending, scheduling and alarm tables (may be included with the sequence of operation). Provide reset routines (based on outdoor air temperature or zone demand) for hot water loop temperature setpoints and supply air static pressure control. Use alarming and trending services during performance testing or commissioning. Alarm every sequence routine when out-of-limits or control/response failure occurs. Display all graphic floor plans, equipment graphics, DDC ladder diagrams, and sequence of operations graphic pages.

All 120-volt wiring shall comply with NFPA 70. All 24-volt wiring shall comply with the IMC and terminal device manufacturer’s recommendations.

Provide training on the installed system according to the maximum training days in UFGS 23 09 23.13 20. All operator workstation functions requiring BACnet services, i.e., navigating through the graphic displays, trending, alarming and monitoring of the new controls system must be demonstrated from the existing operator workstation using only the existing application software and without the need to launch other applications or logon to other vendor applications.

D306001 1.2 ELECTRONIC CONTROLS

If required, provide programmable thermostats with built in keypads for scheduling of day and night temperatures with two setback periods per day. Provide independent summer and winter programs. Thermostats shall have temporary and manual override of schedule and battery backup.

D3070 SYSTEMS TESTING AND BALANCING

D3070 1.1 HVAC SYSTEM

Provide HVAC systems testing and balancing that complies with the requirements specified in UFGS Specification Section 23 05 93, *Testing, Adjusting, and Balancing for HVAC*. The Designer of Record shall prepare UFGS Specification Section 23 05 93, as a part of the project specification and shall include the prepared specification section in the design submittal for the project.

D3090 OTHER HVAC SYSTEMS AND EQUIPMENT

D309001 GENERAL CONSTRUCTION ITEMS

D309001 1.1 SEISMIC DESIGN

Provide in accordance with UFC 3-401-01, *Mechanical Engineering*.

D309002 REFRIGERATION SYSTEMS

D309090 OTHER SPECIAL MECHANICAL SYSTEMS

D309090 1.1 ENERGY RECOVERY WHEELS

Total energy (enthalpy) type energy recovery wheels (heat wheels). Media shall be aluminum or a lightweight polymer coated with a corrosion-resistant finish. Etched or oxidized surfaces are not acceptable. Heat transfer surfaces shall be coated with a non-migrating (permanently bonded) absorbent specifically developed for the selective transfer of water vapor. Equal sensible and latent recovery efficiencies shall be documented through a certification program conducted per ASHRAE 84 and AHRI 1060. The energy recovery wheel shall have an insulated housing of double wall construction, rotor seals that are specifically designed to limit cross-contamination, and a rotation detector. Should rotation stop, the rotation detector shall alarm the HVAC control system. Filter sections shall be readily accessible for maintenance.

D309090 1.2 HEAT PIPES

Factory fabricated, assembled and tested heat pipes with counter-flow arrangement. Provide hermitically sealed, seamless aluminum tube cores with extended surfaces. Heat exchanger frame shall be constructed of not less than 16-gage galvanized steel and fitted with intermediate tube supports, and flange connections. Provide tube end covers and a partition of galvanized steel to separate exhaust and supply air streams without cross-contamination. A refrigerant shall be used as the working fluid. Type I refrigerants are not allowed.

-- End of Section --

SECTION D40

FIRE PROTECTION
09/15

D40 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

D40 1.1 DESIGN GUIDANCE

Provide the design and installation of fire protection systems in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification.*

D40 1.1.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC:
UFC 3-600-01	Fire Protection Engineering for Facilities
UFC 1-200-02	High Performance and Sustainable Buildings
UFC 3-600-10N	Fire Protection Engineering

D40 1.2 QUALITY ASSURANCE

Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found not to be in compliance shall be removed, or corrective measures taken, to assure compliance with the referenced standard.

Qualifications, Training Plans, and Test Plans and Procedures indicated herein, shall be submitted 45 calendar days prior to the expected date of

execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

D40 1.2.1 Qualified Workers

D40 1.2.1.1 Fire Protection Designer of Record

Services and qualifications of the FPDOR shall be as specified in UFC 3-600-01 and UFC 3-600-10N. The FPDOR shall review and approve all fire protection engineering submittals.

D40 1.2.1.2 Fire Protection Engineering Technicians

Workers required herein to be certified by the National Institute for Certification in Engineering Technologies (NICET) as an engineering technician in the Fire Protection Engineering Technology program shall be thoroughly trained and experienced, and completely familiar with the specified requirements and the methods needed for proper performance of the work in this section. All documentation required to be submitted for record and/or approval shall include the NICET engineering technician's signature, along with the technician's current NICET certification number, certification subfield, and level.

Installation drawings, shop drawings or working plans, calculations, other required pre-construction documentation and as-built drawings shall be prepared by, or under the direct supervision of a NICET engineering technician as specified in Section 6 D40 of Part 3.

D40 1.2.1.3 Qualified System Installers

Fire Suppression System and Fire Alarm System installers shall be regularly engaged in the installation of the type and complexity of system specified in the Contract documents, and shall have served in a similar capacity for at least three systems that have performed in the manner intended for a period of not less than 6 months.

Installers of Chlorinated Poly Vinyl Chloride (CPVC) sprinkler systems shall be certified by the manufacturer and maintain a copy of their certification on hand at all times.

D40 1.2.1.4 Fire Protection QC Specialist

The Fire Protection (FP) QC Specialist shall be a U.S. Registered Fire Protection Engineer (FPE) and shall be an integral part of the Prime Contractor's Quality Control Organization. This FPE shall have no business relationships (owner, partner, operating officer, distributor, salesman, or technical representative) with any fire protection equipment device manufacturers, suppliers or installers for any such equipment provided as part of this project. The Fire Protection Designer of Record (FPDOR) may serve as the FPQC Specialist provided the following qualifications are met.

a. Qualifications/Experience: The FPQC Specialist shall have obtained their professional registration by successfully completing the Fire Protection Engineering discipline examination. This FPE shall have a minimum of 5 years full time and exclusive experience in every aspect of facility design and construction as it relates to fire protection, which includes, but is not limited to, building code analysis, life safety code analysis, design of automatic detection and suppression systems, passive fire protection design, water supply analysis, and a multi-discipline coordination reviews, and construction surveillance.

b. Area of Responsibility: The FPQC Specialist is responsible for assuring the proper construction and installation of life safety and fire protection features across all disciplines and trades. The FPQC Specialist shall be responsible for assuring that life safety and fire protection features are provided in accordance with the design documents, approved construction submittals, and manufacturer's requirements. Examples include, but are not limited to, water distribution systems including fire pumps and fire hydrants, fire resistive assemblies such as spray-applied fire proofing of structural components and fire rated walls/partitions, fire alarm and detection systems, fire suppression and standpipe systems, and emergency and exit lighting fixtures.

c. Construction Surveillance: The FPQC Specialist shall visit the construction site as necessary to ensure life safety and fire protection systems are being constructed, applied, and installed in accordance with the approved design documents, approved construction submittals, and manufacturer's requirements. Frequency and duration of the field visits are dependent upon particular system components, system complexity, and phase of construction. At a minimum, field visits shall occur just prior to installation of suspended ceiling system to inspect the integrity of passive fire protection features and fire suppression system piping, preliminary inspections of fire alarm/detection and suppression systems, and final acceptance testing of fire alarm/detection and suppression systems. The FPQC Specialist shall prepare a written report detailing compliance of any outstanding submittal review comments, summarizing the results of all tests, detailing all discrepancies discovered, corrective action taken, all forms as required by the respective NFPA codes, and recommendations/certifications for acceptance. Forward one copy of the report with attachments to the Naval Facilities Engineering Command Fire Protection Engineer.

D40 1.2.2 Performance Verification Testing

All systems shall have operational tests to demonstrate compliance with contract requirements and respective NFPA codes, International Building Code and as noted below. Test procedures shall be in full compliance with the respective NFPA codes, the equipment manufacturer recommendations, and UFC 3-600-10N. Provide all personnel,

equipment, and materials for tests. Return trips to witness repeat acceptance tests due to failure of previous tests will be at the Contractor’s expense.

D40 1.2.2.1 Preliminary Inspections and Final Acceptance Testing

The FPQC Specialist shall personally witness all preliminary inspections of fire alarm/detection and suppression systems. Once preliminary inspections have been successfully completed, the FPQC Specialist shall submit a signed certificate to the QC Manager that systems are ready for final inspection and testing. The Naval Facilities Engineering Command Fire Protection Engineer will witness formal tests and approve all systems before they are accepted. The QC Manager shall submit the request for formal inspection at least 15 days prior to the date the inspection is to take place. The QC manager shall provide 10 days advance notice to the Contracting Officer and the activity Fire Inspection Office of scheduled final inspections.

D40 1.2.2.2 Final Life Safety/Fire Protection Certification

The FPQC Specialist shall provide certification that all life safety and fire protection systems have been installed in accordance with the contract documents, approved submittals, and manufacturer's requirements. This certification shall summarize all life safety and fire protection features, and shall bear the professional seal of the FPQC Specialist.

D40 1.2.2.3 System Manufacturers Representatives

The systems manufacturer technical representative shall be present for the final inspection and test for the following systems: fire alarm and detection, fire pump, carbon dioxide, foam generating and clean agent extinguishing.

D40 1.2.2.4 Fire Suppression Water Supply and Equipment

The fire hydrants shall be inspected prior to backfilling the trench surrounding the fire hydrants. A report, including pictures, shall be provided to the Contracting Officer.

Fire pump tests shall be conducted in the presence of the pump, controller, and engine manufacturer technical representatives. The fire pump manufacturer shall also be present for the preliminary test of the fire pump system.

D40 1.2.2.5 Kitchen Hood Fire Extinguishing Systems

The kitchen hood fire extinguishing system shall contain water for the actual performance testing. The nozzles may be bagged in order to minimize damage from water spray.

D40 1.2.2.6 Spray-Applied Fire Proofing and Fire Stopping

See Section C1030 for requirements.

D40 1.2.3 Training

The contractor shall provide training for the active systems within 6 weeks of final acceptance of the systems. The training shall be scheduled at least 2 weeks in advance.

D40 1.3 DESIGN SUBMITTALS

Design Submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*and UFC 3-600-10N, *Fire Protection Engineering*.

D40 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

All fire protection engineering submittals including:

a. Shop Drawings. Provide shop drawings for all systems.
b. Product Data. Provide product data for all equipment.
c. Design Data. Provide design data for all system calculations.
d. Test Reports
e. Certificates

D4010 FIRE ALARM AND DETECTION SYSTEMS

D401001 FIRE ALARM DISTRIBUTION

D401001 1.1 REMOTE ANNUNCIATORS

Remote annunciators shall have a minimum 80 character alphanumeric display with alarm acknowledge, alarm silence, and reset functions.

D401001 1.2 TRANSMITTED SIGNALS

Provide the following signals to be sent to the fire alarm receiving station:

a. Sprinkler Water Flow
b. Smoke Detector
c. Manual Pull Station
d. Supervisory (i.e., valve tamper switch, fire pump loss of power, fire pump phase reversal)
e. Duct Smoke Detector
f. Fire Pump Running
g. Sleeping Room Smoke Detector

D4020 FIRE SUPPRESSION WATER SUPPLY AND EQUIPMENT

D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT

The design point of connection to the existing water supply shall require the approval of the Contracting Officer. The FP DOR shall conduct additional flow

tests after contract award prior to any design submissions. Tests shall be conducted under the supervision of the Contracting Officer.

D4040 SPRINKLERS

D404001 SPRINKLERS & RELEASING DEVICES

D404001 1.1 DESCRIPTION

Areas subject to freezing shall be provided with a dry pipe system. Loading docks may be protected with dry-type sidewall sprinklers supplied by the wet-pipe system.

D404001 1.2 REQUIREMENTS

Utilize upright sprinklers with ordinary temperature rating and color to match finish in normally occupied rooms without a finished ceiling (i.e., laboratories, and other spaces with exposed ceilings).

D4090 OTHER FIRE PROTECTION SYSTEMS

D409001 CARBON DIOXIDE SYSTEMS

Supply shall include storage cylinders, racks, manifolds, beam scales, and associated equipment. Arrange the primary cylinders for automatic discharge upon activation of the main control, and the secondary cylinders for discharge both manually and upon no discharge from the primary cylinders.

D409002 FOAM GENERATING EQUIPMENT

D409002 1.1 SYSTEM CRITERIA

Foam fire protection systems shall incorporate the necessary elements for foam storage, pumping, piping, proportioning, delivery, and detection, activation and alarm systems.

D409002 1.2 SYSTEM OPERATION

Once activated, foam system(s) shall operate until shut down manually. Provide separate circuits from the releasing control panel to each zone of initiating devices. Transmission of signals from more than one zone over a common circuit is prohibited.

D409002 1.3 AFFF CONCENTRATE PUMPS

The foam concentrate pump shall be positive displacement, electric motor driven, drip proof, 240/480 volts, 60 Hz AC. System operation shall be fully automatic, with manual over-ride and manual shutdown.

D409002 1.4 FOAM CONCENTRATE STORAGE TANK

A gage or unbreakable sight glass shall permit visual determination of level of tank contents, unless liquid level is clearly visible through shell of tank.

D409002 1.5 LOW-LEVEL LOW-EXPANSION FOAM SYSTEM

D409002 1.5.1 Discharge Devices

Where used the low-level AFFF nozzle system shall utilize the Viking Grate Nozzle TM, Model GN 200 (or equivalent that is acceptable to the NAVFAC Chief Fire Protection Engineer for this use).

D409002 1.5.2 Test Header

Where used a foam system test header connection with integral gate valves shall be located at each foam system riser. Sufficient 2-1/2 inch (65 mm) male National Standard hose threads, with cap and chain, shall be installed to allow testing of the riser at the design flow rate. A wall escutcheon plate with "FOAM TEST HEADER" in raised letters cast in plate shall be installed.

D409002 1.6 AUTOMATIC WATER CONTROL VALVE ASSEMBLY (DELUGE VALVE)

Where used, the water control valve shall be an electrically actuated type. Valve shall be resettable without opening the valve. Solenoid valve shall be of the normally closed, de-energized type, which opens when energized upon receipt of an electrical signal from the releasing control panel to which it is connected. Solenoid valves used with diaphragm-type valves shall be rated for a maximum pressure differential of 175 psi (1207 kPa). Water control valves used for low-level foam systems shall be capable of recycling to the closed position at an adjustable speed. Valves located in hazardous locations shall be approved for the hazard classification of the area where located.

D409002 1.7 FOAM SYSTEM RELEASING CONTROL SYSTEM

D409002 1.7.1 Manual Releasing Stations

Where used the units shall be dual-action type located inside a clear plastic tamper cover that must be lifted prior to actuating the station. Any lettering on the cover must be "FOAM"; the words "fire" or "fire alarm" shall not appear on the cover. The station shall not require the breaking of glass to actuate. Unit shall have operating instructions clearly marked on the station cover. Unit shall be compatible with the control panel to which it is connected. Operation of a station shall result in immediate release of the foam system for that space.

D409002 1.7.2 Flame Detectors

Where used flame detectors shall operate on the infrared (IR) principle. Detector shall employ three IR sensors to provide multi-spectrum detection. Each detector shall have a manufacturer's swivel mounting bracket. Locate a permanent engraved rigid plastic or metal label at each detector with detector aiming information (degrees horizontal and vertical) for the corresponding detector.

D409002 1.7.3 Abort Switch

Where used a foam release abort switch shall be installed adjacent to each manual releasing station and at the releasing panel and be

properly labeled (Minimum 1Â½ inch high lettering stating: "CONTINUOUS OPERATION OF SWITCH WILL ABORT FOAM FLOW UNTIL SYSTEM IS RESET". Switch shall be deadman type which when depressed ceases flow of foam solution (both water and foam concentrate). Upon release of the switch, the system shall return to its previous operational state. Switch and wiring shall be supervised.

D409003 CLEAN AGENT SYSTEMS

D409003 1.1 SYSTEM INSTALLATION

The system shall be supplied and installed by a factory-authorized distributor. The distributor shall be trained by the manufacturer to design, install, test, and maintain the system and shall be able to provide proof of training upon request.

D409003 1.2 RELEASING CONTROL SYSTEM

Where provided manual release stations shall be dual-action type located inside a clear plastic tamper cover that must be lifted prior to actuating the station. The words "fire" or "fire alarm" shall not appear on the cover. The station shall not require the breaking of glass to actuate. Unit shall have operating instructions clearly marked on the station cover. Unit shall be compatible with the control panel to which it is connected. Operation of a station shall result in immediate release of the clean agent system for that space.

D409004 HOOD & DUCT FIRE PROTECTION

Exhaust hoods with grease extractors listed by UL or FM are not required to have protection downstream of the grease extractor.

-- End Of Section --

SECTION D50

ELECTRICAL
09/15

D50 GENERAL

RFP Part 3, including the Engineering System Requirements (ESR) provides project specific requirements. The RFP Part 4, Performance Technical Specifications (PTS), provides generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

D50 1.1 NARRATIVE

This section covers installations inside the facility and out to the five foot line. See PTS Section G40, *Site Electrical*, for continuation of systems beyond the five foot line.

D50 1.2 ELECTRICAL DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

When all product Quality Control information is included in the Unified Facility Criteria (UFC) and there are requirement options identified in the ESR, then the Uniformat Level 4 titles (and possible subtitles) are included without additional verbiage. One example of this is D501090, OTHER SERVICE AND DISTRIBUTION.

D50 1.2.1 Government Publications

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-501-01, Electrical Engineering)
UFC 1-200-02	High Performance and Sustainable Buildings
UFC 3-580-10	Navy and Marine Corps Intranet (NMCI) Standard Construction Practices

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 26 08 00	Apparatus Inspection and Testing
UFGS 26 20 00	Interior Distribution System
UFGS 26 23 00	Low Voltage Switchgear
UFGS 26 24 13	Switchboards
UFGS 26 29 23	Variable Frequency Drive Systems Under 600 Volts
UFGS 26 32 13.00 20	Single Operation Generator Sets
UFGS 26 32 26	Motor Generator Sets, 400 Hertz
UFGS 26 33 53.00 20	Uninterruptible Power Supply (UPS)
UFGS 26 35 43	400 Hertz Solid State Frequency Converters
UFGS 26 36 23.00 20	Automatic Transfer Switches
UFGS 26 41 00	Lightning Protection System
UFGS 26 51 00	Interior Lighting
UFGS 27 10 00	Building Telecommunications Cabling Systems
UFGS 28 20 00.00 20	Electronic Security System (ESS), Commercial

D50 1.3 QUALITY ASSURANCE

Qualifications, certifications, and Test Plans indicated herein shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

The Designer of Record is responsible for approving the submittals listed below.

D50 1.3.1 Qualified Testing Organization

Contractor shall engage the services of a qualified testing organization to provide inspection, testing, calibration, and adjustment of the electrical distribution system and equipment listed in paragraph entitled "Acceptance Tests and Inspections" herein. Organization shall be independent of the supplier, manufacturer, and installer of the equipment. The organization shall be a first tier subcontractor.

Submit name and qualifications of organization. Organization shall have been regularly engaged in the testing of electrical materials, devices, installations, and systems for a minimum of 5 years. The organization shall have a calibration program, and test instruments used shall be calibrated in accordance with NETA ATS.

Submit name and qualifications of the lead engineering technician performing the required testing services. Include a list of three comparable jobs performed by the technician with specific names and telephone numbers for reference. Testing, inspection, calibration, and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute for Certification in Engineering Technologies (NICET) with a minimum of 5 years' experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

D50 1.3.2 NEC Qualified Worker

Provide in accordance with NFPA 70. Qualified Workers shall be allowed to be assisted by helpers on a 1 to 1 ratio, provided such helpers are registered in recognized apprenticeship programs. Submit a certification confirming NEC Qualified Worker requirements.

D50 1.3.3 Qualified PV Installer

Installation of photovoltaic systems shall be by experienced and trained installers. At minimum the PV installation supervisor shall hold a "PV Installer Certification" as issued by the North American Board of Certified Energy Practitioners (NABCEP) and hold a Certified Solar Roofing Professional (CSRP) credential issued by RISE "Roof Integrated Solar Energy Inc".

D50 1.3.4 Qualified Telecommunications Worker

All installers assigned to the installation of telecommunications systems or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installation Technicians or have a minimum of 3 years experience in the installation of the specified copper and fiber optic cable and components. Include names and locations of two projects successfully completed using optical fiber and copper communications cabling systems. Include written certification from users that systems have performed satisfactorily for not less than 18 months. Include specific experience in installing and testing structured telecommunications distribution systems using optical fiber and Category 5e cabling systems.

D50 1.3.5 Material Standards

Ensure service support and provide manufacturer's nameplate in accordance with PTS Section Z10, *General Performance Technical Specification*.

D50 1.3.5.1 Warning Labels

Provide arc flash warning labels.

D50 1.3.5.2 Field-Required Nameplates

Provide laminated plastic nameplates for each switchboard, switchgear, panelboard, equipment enclosure, motor controller, relay, and switch. Each nameplate must identify the function and, when applicable, the position. Provide melamine plastic nameplates, 0.125 inch (3 mm) thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 1-inch by 2-1/2 inches (25 mm by 65 mm). Lettering shall be a minimum of 0.25 inch (6.35 mm) high normal block style.

D50 1.3.6 Factory Testing

The Government reserves the right to witness all factory testing. The manufacturer shall have a calibration program that assures that all applicable test instruments are maintained within rated accuracy.

D50 1.3.7 Electrical System Startup and Testing

Submit test plans for approval. The test plans shall be tailored to the systems provided.

The test plan shall list make and model and provide functional description of the test instruments and accessories and shall describe the setup of the tests to be conducted. Test instruments shall be capable of measuring and recording or displaying test data at a higher resolution and greater accuracy than specified for the equipment's performance.

D50 1.3.7.1 Factory Trained Engineer

Provide a factory trained engineer to supervise start-up and testing as required in referenced specifications.

D50 1.3.7.2 Performance Verification Testing

The Contractor shall show by demonstration in service that all circuits and devices are in operating condition. Tests shall be such that each item of control equipment will function not less than five times. The Contractor shall provide all necessary test equipment, tools, fuel, load banks, labor, and materials for testing. As a minimum, all systems shall be tested in accordance with manufacturer's recommendations. Additional testing requirements for the various systems are described with those systems, hereinafter. The Contractor shall assure that all applicable test instruments are maintained within rated accuracy. Dated calibration labels shall be visible on all test equipment.

Submit a separate electrical field test plan in accordance with manufacturer's recommendations and that conforms to NETA ATS for each piece of Electrical Distribution Equipment and System requiring Performance Verification Testing.

The following items identify specific test requirements. Additional test requirements are contained in the applicable UFGS.

a. Panelboards - Field test each GFI and AFI circuit breaker with a UL 1436-certified outlet circuit tester to verify correct operation.
b. Motor control centers – Test motor control centers and motor starters in accordance with NETA ATS.
c. Surge Protective Devices (SPD) -

1) Inspect for physical damage and compare nameplate data with the drawings and specifications, if applicable. Verify from the nameplate data that the SPD equipment is appropriate for the system voltage.

2) Verify lead length between the SPD equipment and the circuit connection is less than one foot.

3) Verify wiring between the SPD equipment and the circuit connection does not include high-inductance coils or sharp bends.

4) Confirm circuit breaker used for SPD circuit connection is sized in accordance with SPD manufacturer's requirements.

5) Ensure SPD equipment is grounded in accordance with SPD manufacturer's requirements. Check the ground lead on each device for individual attachment to the ground bus or electrode.

6) Check tightness of connections in accordance with NETA ATS.

7) For SPD equipment with visual indications of proper operation, verify that it displays normal operating characteristics.

d. Busway – Conduct standard tests for busway in accordance with NETA ATS.
e. Receptacles – Test GFI receptacles with a UL 1436-certified outlet circuit tester to verify correct operation.
f. Lighting - Aim photocell switches and locate light level sensors in accordance with the manufacturer's recommendations. Verify that equipment operates in accordance with user's requirements and in accordance with manufacturer’s recommendations. Fluorescent lamps on electronic dimming ballast control shall be burned in at full light output for 100 hours before dimming.
g. Telecommunication - Test telecommunications systems in accordance with applicable EIA/TIA requirements.
h. Public address and intercommunications systems - Tests shall include originating and accepting messages at each station, at proper volume levels, without cross-talk or noise from other links or non-designated units. Test shall utilize the phonetically balanced monosyllabic

work intelligibility test in accordance with ANSI S3.2 (ASA 85). In order to be acceptable, a score of at least 75 percent must be obtained for each system test.

i. Community Antenna Television Systems - Confirm design and installation is in compliance with NCTA-02, 47 CFR 76.605 and in accordance with FCC proof of performance requirements. Test plan shall define tests required to ensure that the system meets technical, operational, and performance specifications. Test plan shall include plan for testing for signal leakage.

j. Electronic security systems (ESS) – Test ESS in accordance with UFGS requirements.

k. Grounding systems - Test the grounding system in accordance with NETA ATS.

l. Lightning protection - Upon completion of the installation, Contractor shall furnish the UL Lightning Protection Inspection Certificate certified to UL 96A for the system.

m. Emergency lighting - Test emergency lighting that is intended for means of egress in accordance with NFPA 101, Section 5-9. Confirm the emergency lighting system operates for a minimum of 90 minutes and emergency illumination satisfies NFPA 101, Section 5-9, specified levels.

n. Photovoltaic Energy System - Provide test plan that meets the requirements of IEC 62446. Test plan shall include expected performance values. System performance shall be compared to expected performance and shall include at a minimum solar irradiance, DC energy, AC energy, ambient air temperature and PV cell temperature. System performance shall be measured and reported for at least one full day. If the performance monitoring of the installed array indicates the array is not meeting its required performance predictions it shall be corrected by the Contractor at the Contractor's expense. Following correction, performance monitoring will again be performed until the array meets required performance predictions. Measurements made under actual installation and temperature shall be normalized to Standard Test Conditions (STC).

1) Verify that non-current carrying metal parts are grounded.

2) Verify that all components are labeled.

3) Verify mounting supports are installed properly and all fasteners are installed correctly and torqued to manufacturer's instructions.

4) Test open circuit voltage of each string in full sunlight.

5) Submit startup and testing report.

D50 1.3.7.3 Acceptance Tests and Inspections

The Government reserves the right to witness all Acceptance Tests and Inspections, review data, and request other such additional inspections and repeat tests as necessary to ensure that the system and provided services conform to the stated requirements.

The Qualified Testing Organization shall provide the Acceptance Tests and Inspections test plan and perform the acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with NETA ATS, the manufacturer's recommendations, and paragraph entitled "Field Quality Control" of each applicable specification section. Tests identified as optional in NETA ATS are not required unless otherwise specified. Equipment shall be placed in service only after completion of required tests and evaluations of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing. Perform acceptance tests and inspections on Diesel-Electric Generators, Uninterruptible Power Supply (UPS) Systems, 400-Hertz Motor Generator Sets, 400-Hertz Solid State Frequency Converters, Automatic Transfer Switches, and Switchboards and Switchgear.

D50 1.4 DESIGN SUBMITTALS

Design Submittals shall be in accordance with PTS Section Z10, *General Performance Technical Specifications*, UFGS Section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine Corps Design Procedures*, and UFC 3-501-01, *Electrical Engineering*.

Submit all PV submittals to the Contracting Officer for approval.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR shall edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS Section Z10, *General Performance Technical Specifications*.

UFGS 26 08 00, *Apparatus Inspection and Testing*

UFGS 26 20 00, *Interior Distribution System*

UFGS 26 23 00, *Low Voltage Switchgear*

UFGS 26 24 13, *Switchboards*

UFGS 26 29 23, *Variable Frequency Drives System Under 600 Volts*

UFGS 26 32 13.00 20, *Single Operation Generator Sets*

UFGS 26 32 26, *Motor Generator Sets, 400 Hertz*

UFGS 26 33 53.00 20, *Uninterruptible Power Supply (UPS)*

UFGS 26 35 43, 400 *Hertz Frequency Converters*

UFGS 26 36 23.00 20, *Automatic Transfer Switches*

UFGS 26 41 00, *Lightning Protection System*

UFGS 26 51 00, *Interior Lighting*

UFGS 27 10 00, *Building Telecommunications Cabling Systems*

UFGS 28 20 00.00 20, *Electronic Security System (ESS), Commercial*

D50 1.4.1 Sustainable Design Submittal

Submit sustainable design submittals in accordance with UFGS 01 33 29.05 20, *Sustainability Reporting for Design-Build*.

D50 1.5 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the PTS Section Z10 requirements, the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

Electrical Equipment, OMSI information for equipment, and Quality Assurance Submittals listed above.

Provide certification that all adjustable protective device settings have been set in accordance with the coordination study for the as-built equipment and configuration.

D50 1.5.1 Sustainable Construction Submittal

Submit sustainable construction submittals in accordance with UFGS 01 33 29.05 20, *Sustainability Reporting for Design-Build*.

D5010 ELECTRICAL SERVICE AND DISTRIBUTION

D501001 MAIN TRANSFORMERS

Pad mounted distribution transformers shall be in accordance with PTS Section G40, *Site Electrical Utilities*.

D501002 SERVICE ENTRANCE EQUIPMENT

When a switchboard is required, the Designer of Record shall utilize UFGS Section 26 24 13 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

When low voltage switchgear is required, the Designer of Record shall utilize UFGS Section 26 23 00 for the project specification, and shall submit the edited

specification section as a part of the design submittal for the project.

When digital metering is required for connection to the Direct Digital Controls (DDC) system, the Designer of Record shall utilize UFGS Section 26 24 13 to specify the digital metering requirements and shall submit the edited specification section as a part of the design submittal for the project.

D501003 INTERIOR DISTRIBUTION TRANSFORMERS

D501004 PANELBOARDS

Panelboards shall comply with UL 67 and UL 50. UL 869A shall apply if used as service entrance equipment. Panelboards for non-linear loads shall be UL listed, including heat rise tested, in accordance with UL 67, except with the neutral assembly installed and carrying 200 percent of the phase bus current during testing.

Provide molded case circuit breakers in accordance with UL 489. Ground fault circuit interrupting circuit breakers shall comply with UL 943. Arc fault circuit breakers shall comply with UL 489 and UL 1699.

D501005 ENCLOSED CIRCUIT BREAKERS

Provide molded case circuit breakers in accordance with UL 489. UL 869A shall apply if used as service entrance equipment. Provide with solid neutral when grounded conductor is present.

D501006 MOTOR CONTROL CENTERS

Motor control centers shall comply with UL 845, NEMA ICS 2, and NEMA ICS 3. Motor controllers shall comply with UL 508. Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR 1910.147.

D501006 1.1 VARIABLE FREQUENCY DRIVES (VFD)

When Variable Frequency Drives are required, the Designer of Record shall utilize UFGS Section 26 29 23 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D501090 OTHER SERVICE AND DISTRIBUTION

D501090 1.1 SURGE PROTECTIVE DEVICE (SPD)

D501090 1.2 BUSWAY

Busway shall comply with NEMA BU 1 and UL 857.

D5020 LIGHTING AND BRANCH WIRING

D502001 BRANCH WIRING

Provide wiring and connections for special outlets where required.

All homerun circuits must contain no more than 3 phase conductors.

Switches shall comply with NEMA WD-1 and UL 20.

D502002 LIGHTING EQUIPMENT

Installation shall meet requirements of manufacturer's recommendations and the additional requirements for "Severe Seismic Disturbance" contained in ASTM E 580. Fixture support wires shall conform with ASTM A 641/A 641M, galvanized regular coating, soft temper.

D502002 1.1 BALLASTS

Electronic ballasts shall include a 5-year warranty.

D5030 COMMUNICATIONS AND SECURITY

D503001 TELECOMMUNICATIONS SYSTEMS

D503002 PUBLIC ADDRESS SYSTEMS

D503003 INTERCOMMUNICATIONS SYSTEMS

D503004 TELEVISION SYSTEMS

D503004 1.1 CLOSED CIRCUIT TELEVISION (CCTV) FOR VIDEO TRAINING

D503004 1.2 COMMUNITY ANTENNA SYSTEM (CATV)

D503005 SECURITY SYSTEMS

D503005 1.1 ELECTRONIC SECTURITY SYSTEMS (ESS)

When an ESS system is required, the Designer of Record shall utilize UFGS Section 28 20 00.00 20 for the project specification and shall submit the edited specification section as a part of the design submittal for the project.

D503005 1.2 PROTECTED DISTRIBUTION SYSTEMS (PDS)

Protected Distribution Systems shall be in accordance with UFC 3-580-10 and IA PUB-5239-22, Information Assurance Protected Distribution System (PDS) Guide Book.

D503005 1.3 SENSITIVE COMPARTMENTED INFORMATION FACILITIES (SCIF)

Electrical systems installed within SCIF spaces or facilities shall comply with ICD 705, ICS 705-1, ICS 705-2, and with IC Tech Spec for ICD/ICS 705.

D503006 INDUSTRIAL CONTROL SYSTEMS (ICS)

D503090 OTHER COMMUNICATIONS AND ALARM SYSTEMS

D5090 OTHER ELECTRICAL SERVICES

D509001 GENERAL CONSTRUCTION ITEMS (ELECTRICAL)

D509002 EMERGENCY LIGHTING AND POWER

D509002 1.1 EMERGENCY LIGHTING

D509002 1.2 EMERGENCY GENERATORS

When an emergency generator is required, the Designer of Record shall utilize UFGS Section 26 32 13.00 20 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D509002 1.3 AUTOMATIC TRANSFER AND BYPASS/ISOLATION SWITCHES

When an Automatic Transfer Switch is required, the Designer of Record shall utilize UFGS Section 26 36 23.00 20 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D509002 1.4 UNINTERRUPTIBLE POWER SUPPLY (UPS) SYSTEM

When a UPS system is required, the Designer of Record shall utilize UFGS Section 26 33 53.00 20 and shall submit the edited specification section as a part of the design submittal for the project.

D509003 GROUNDING SYSTEMS

D509004 LIGHTNING PROTECTION

When a lightning protection system is required the designer of record shall utilize UFGS section 26 41 00 and shall submit the edited specification section as a part of the design submittal for the project.

D509005 ELECTRIC HEATING

D509006 ENERGY MANAGEMENT CONTROL SYSTEM

D509007 PHOTOVOLTAIC ENERGY SYSTEM

Provide a grid tied photovoltaic energy system including roof mounted crystalline photovoltaic panels, combiner boxes, inverters, and support system.

Provide all labor, materials, equipment and supervision required to implement the design and to provide a fully operational system.

Provide crystalline photovoltaic modules with a 20-year limited manufacturer warranty that generates no less than 80% of the rated output under Standard Test Conditions (STC). PV modules shall comply with IEC-61215 and UL-1703. Provide with integrated bypass diodes, IP65, IP67 connectors.

Provide inverters that comply with UL-1741 and IEEE-1547. Provide with output THD 5% maximum, ambient operating temperature range of -25 degree C to 55 degree C with a minimum efficiency of 95 percent at full load, grid tied.

Provide start-up and testing utilizing certified technician. Submit startup and testing report.

D509007 1.1 CODES AND STANDARDS

The PV system hardware and services shall meet or exceed all applicable local, State and utility requirements, conform to the applicable codes and standards, and have passed the listing and qualification tests, listed below. (Comply with the most recent version of each document).

a. IEEE 1262 "Recommended Practice for Qualification of Photovoltaic Modules".
b. PowerMark certification for PV modules.
c. IEEE Standard 928-1986, Recommended Criteria for Terrestrial Photovoltaic Power Systems (PV system performance criteria).
d. IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems.
e. Underwriters Laboratories 1741-2001 (UL Standard for Inverters and Charge Controllers).
f. Underwriters Laboratories 1703 (UL Standard for Listing Photovoltaic Modules).
g. Certification of PV Equipment: All PV modules, inverters, and electrical components shall be required to be listed or recognized by an appropriate and recognized United States Safety Laboratory (for example: UL or ETL).

D509007 1.2 PHOTOVOLTAIC ROOFTOP APPLICATION ANALYSIS

Provide a comprehensive "Photovoltaic Application Analysis" with a detailed description of system, application, site shading conditions and expected kW output of the rooftop photovoltaic applications. The analysis shall utilize the Solmetric Suneye or the Solar Pathfinder shading analyzers to analyze the effects of the existing site shading conditions. Analysis shall include estimated PV output in kWh per year. Coordinate rooftop application analysis with other equipment that is required to be placed on the roof to determine space available and proper solar orientation for photovoltaic equipment.

D509007 1.3 TECHNICAL REQUIREMENTS

The contractor work responsibilities include at a minimum: system design, equipment selection, and PV system installations. System shall be individually capable of providing peak power output of at least proposed PV system size, 208 or 480 volt, 3-phase, 4-wire power.

The final System configuration shall allow automatic operation without operator intervention. System design and equipment specifications shall minimize maintenance requirements. System shall include metering that must be incorporated with current AMI network (Advanced Metering Infrastructure) and planned energy metering projects.

The inverter(s) disconnects and associated electrical equipment must be located in an area that is accessible, weather-protected, and secure from vandalism and personal injury.

Disconnects and over current devices shall be mounted in approved boxes, enclosures, or panel boards. Disconnects and switches shall be DC rated when used in DC applications. Metal enclosures and boxes shall be bonded to the grounding conductor.

At a minimum, electrical meters shall capture the following data on individual system performance (minimum solar irradiance, DC power, AC real power, AC current, AC voltage, and power factor (recommend ION 8600 for AC); ambient air temperature, PV cell temperature, kW, and kWh). This data shall be captured at hourly intervals for a minimum one year. Units of temperature, power, and current shall be in Fahrenheit, Watts, and Amps respectively.

Transformers, if required, shall have a minimum efficiency based on factory test results of not less than the efficiency indicated in 10 CFR 431, Subpart K, paragraph 431.196(b). Transformers shall be housed in a NEMA 4X enclosures.

Layout of modules on roof shall meet the requirements of NFPA-1 including labeling, roof access, and roof pathways. Coordinate roof venting requirements with fire protection engineer.

Mounting structures shall be corrosion resistant to marine environment.

Provide permanent plaque or directory at each building service and power source identifying all other building services and power sources.

Refer to RFP Part 4, PTS B30 *Roofing*for additional layout and installation requirements.

D509007 1.4 OPERATORS MANUALS AND TRAINING

Operators manuals for each system component shall include detailed instructions on how to operate the system, programming and installation instructions, emergency operating procedures, default program values and set points, listing of field programmed variables and set points, equipment wiring diagrams, product model number, with Name, Address and Telephone number of local representative, and starting, operating, and shut down procedures. Include normal and emergency shut down procedures, schedule of maintenance work, if any, recommended cleaning agents and methods, replacement parts list, including internal fuses, and warranty information.

Provide a formal 2-hour on-site training session instructing operators in the operation and maintenance of the new system, including operation and maintenance of inverters, disconnects and other system components. Instruct personnel in removal and installation of panels, including wiring and all connections. At the time of training the Contractor shall furnish, for the equipment specified, operation and maintenance manuals, record drawings and recommended spare parts lists identifying components adequate for competitive supply procurement for operation and maintenance of system.

D509007 1.5 FIELD QUALITY CONTROL

Schedule connection of the photovoltaic system with the Contracting Officer such that the Contracting Officer or his representative can be present when the photovoltaic system is tied to the grid.

Provide test plan that meets the requirements of IEC 62446. Test plan shall have expected values for testing. Provide test results.

Tests shall include the following:

a. Verify that non-current carrying metal parts are grounded.
b. Verify that all components are labeled.
c. Verify mounting supports are installed properly, and all fasteners are installed correctly and torqued to manufacturer's instructions.
d. Test open circuit voltage of each string in full sunlight.
e. Test output of inverter. Measure solar irradiance. Perform calculations to show inverter output is consistent with the expected performance.

D509090 OTHER SPECIAL SYSTEMS AND DEVICES

D509090 1.1 400 HERTZ SYSTEMS

The Designer of Record shall utilize UFGS Section 26 32 26 or UFGS Section 26 35 43 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

--End Of Section--

SECTION E10

EQUIPMENT
09/15

E10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

E10 1.1 GENERAL REQUIREMENTS

Where required by the project program, the contractor shall obtain the services of equipment specialists to specify any audiovisual, shop, fitness equipment, or other specialty equipment. Equipment specialists shall not have any affiliation with the product specified. All specialty equipment will be installed by qualified installers regularly engaged in installing the specialty equipment. Systems furnishings installers must be the systems furniture manufacturer's dealer of record.

E10 1.2 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards that are referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

E10 1.2.1 Industry Standards and Codes

Loading Dock Equipment Manufacturers' Association (LODEM)

E10 1.2.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, ArchitectureUFC 3-120-10, Interior Design)

UFC 1-200-02	High Performance and Sustainable Buildings

E10 1.3 PERFORMANCE VERIFICATION AND COMPLIANCE TESTING

Verification of satisfactory special equipment and furnishing systems performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

E10 1.3.1 Field Tests for Dock Leveling Equipment

a. Roll-over Tests - Move roll-over load of 20,000 pounds (9,072 kg) over the dock leveler between the bed of a freight carrier and the building loading dock surface for ten cycles. With the ramp extension retracted and the ramp platform leveled with the building loading dock surface, run a 20,000 pound (9,072 kg) roll-over load over the ramp in various directions for 20 cycles. No permanent deformation or hydraulic fluid leakage shall occur subsequent to examination after these tests.

b. Drop Tests - Twice, drop test the dock leveler at the indicated rated capacity as follows: With the load on the platform and the load resting on a vehicle carrier bed not less than 10 inches (254 mm) above loading dock surface, pull the carrier or pull away from the lip, leaving the loading ramp unsupported. The measured vertical drop of the dock leveler taken at the point where the lip rests on the vehicle carrier shall not exceed 4 inches (102 mm) during each of the drop tests. Inspect the loading ramp after each drop and ensure no damage or distortion to the mechanical, electrical, or structural components. There shall be no leakage from the hydraulic system.

c. Acceptance Tests - Perform an acceptance test in the presence of the dock leveler manufacturer and the Contracting Officer subsequent to the roll-over load and drop tests. Conduct operation of the equipment through all of its motions and specified checks as follows: (a) extend lip to rest on a variety of freight carriers with beds up to 12 inches (305 mm) above and below deck level; (b) test 102 mm (4 inches) drop limitation with 7,000 pound (3,175 kg) load on ramp, evenly distributed; (c)test level compensation with the ramp, loaded with a minimum of 7,000 pounds (3,175 kg); and (d) test proper compensation (float) for various compression of counter-springs, with ramp loaded and unloaded.

E10 1.4 DESIGN SUBMITTALS

Design Submittals shall be in accordance with UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine Corps Design Procedures*, UFC 3-101-01, *Architecture*, and UFC 3-120-10, *Interior Design*.

E10 1.5 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements,

the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

Field tests of equipment, vault door, loading dock equipment, kitchen equipment and unit kitchens.

Energy efficiency ratings for food service equipment, as applicable.

E1010 COMMERCIAL EQUIPMENT

E101005 SECURITY & VAULT EQUIPMENT

E101005 1.1 VAULT AND DOORS

The Vault ("Weapons Storage Area" (WSA) or "Armory", or other title according to the project program) space shall be designed in accordance with criteria in MIL-HDBK-1013/1A to provide at least 10 minutes of delay time against low and medium threat severity levels of forced entry. The space is required to be built to the construction standards described in MIL-HDBK-1013/1A for Class A vaults. The reinforced concrete must have minimum 28-day compressive strength of at least 3000 PSI (20,684 kPa) and the floor, walls, and ceiling/roof components of this space must all be cast in place and at least 8 inches (200 mm) thick. The door into the vault must be a GSA-Approved and labeled Class 5 Security Vault Door that conforms to Federal Specification AA-D-00600. Provide door manufacturer’s modified standard or custom Day Gate, designed for use with the vault door furnished, for access control and weapons issue. Except for the door opening, penetrations and openings through the structural “security” envelope of the floor, walls, and ceiling/roof of the Vault that are 96 sq. inches (618 sq. cm) or greater with the least dimension greater than 6 inches (150 mm) are not allowed. PTS Section D50, Electrical, includes requirements for Intrusion Detection System (IDS) within the space and for Security Lighting at the outside of the Vault Door to the space.

E101005 1.1.1 Set-backs

Where the perimeter walls of the WSA spaces are part of the facility exterior walls, the vault walls shall be set back from the exterior part of the exterior wall to allow at least 4 inches (100 mm) for the normal wall facing to cover the vault walls.

E101005 1.1.2 Egress

Where a WSA space exceeds 1000 square feet (90 sq m) in floor area, or will have more than eight occupants, the space shall have a minimum of 2 exits for safety purposes. When more than one entrance / exit is required, each shall be equipped with a Security Vault Door, with only one used for normal entry access.

E101005 1.2 SECURITY VAULT DOOR

Security Vault Door must be GSA-Approved and labeled Class 5 Security Vault Door that conforms to Federal Specification AA-D-00600. Provide GSA-Approved and labeled Class 5 Security Vault Door that conforms to Federal Specification AA-D-00600. Door(s) for normal or special entry access shall be Class 5, either Type IIR- right opening swing without optical device or

Type IIL- left opening swing without optical device as determined by design arrangement, Style K- Key change combination lock, Design S- single lock.

Where a second or additional door is required for safety purposes, door(s) for exit only shall be Class 5, either Type IR- right opening swing with optical device or Type IL- left opening swing with optical device as determined by design arrangement, Style K- Key change combination lock, Design B- no exterior hardware.

E101005 1.3 DAY GATE

Provide vault door manufacturer's modified standard or custom day gate designed for use with vault door furnished, for access control and weapons issue. Day gate construction shall be minimum 10 gage (3.4 mm) steel flattened and expanded metal welded to a 1 inch (25 mm) minimum steel channel or angle welded frame; expanded metal pattern shall be 1 inch by 1-3/4 inch (25 by 45 mm) diamond grid. Maximum clearance between sides, top and bottom of the day gate and the vault door-frame and floor shall be 1 inch (25 mm) when the day gate is closed. Provide gate hinged on same side as the vault door, swinging to 180 degrees into the vault from closed to open positions. Provide day gate with locking device operable from both sides; the outside by key and the inside by key, knob, lever, or deadbolt; the inside locking device shall either be positioned so that it is not accessible from the outside or it shall be operable by key only. Day gate shall include an issue port opening, cover with locking mechanism, and shelf. The issue port shall be a framed opening welded to the day gate frame with a hinged door cover. The hinged door shall be minimum 18 gage (1.2 mm) steel and shall be lockable from the inside only. The opening shall be 8 inches (200 mm) high and 12 inches (300 mm) wide; tolerances are plus or minus 0.125 inch (3.2 mm). When the issue port is closed, the hinged door cover shall match the opening to within 0.0625 inch (1.6 mm). The shelf shall be minimum 16 gage (1.5 mm) stainless steel, 12 inches (300 mm) deep by 12 inches (300 mm) wide to match the port opening, and shall be capable of withstanding a vertical force of 100 lbf (445 N) at any point without deformation. Provide the manufacturer’s standard painted finish to match that of the vault door. The day gate shall not interfere with the operation of vault door inner escape device.

E1020 INSTITUTIONAL EQUIPMENT

Institutional equipment includes items that are normally found in hospitals, laboratories, auditoriums, and libraries.

E102001 MISCELLANEOUS COMMON FIXED & MOVABLE EQUIPMENT

This section shall include fixed workbenches, hazardous and non-hazardous shop materials cabinetry, shop tools, and other fixed and movable equipment.

E102009 AUDIO-VISUAL EQUIPMENT

E102009 1.1 CEILING MOUNT FOR PROJECTOR

Provide the ceiling mounted hardware for a digital projector, to be coordinated with support blocking (see PTS Section C10, *Interior Construction*) and electrical and data connections (see Section D50, *Electrical*).

E1030 VEHICULAR EQUIPMENT

E103002 LOADING DOCK EQUIPMENT

This paragraph covers the requirements for dock bumpers, truck-trailer restraining devices, and industrial, mechanical and electro-hydraulic dock levelers of a fixed hinged type. All loading dock equipment shall be Navy certified.

Provide a Loading Dock Equipment System for the protection of service docks and for the loading and unloading of service vehicles.

E103002 1.1 DOCK LEVELERS

Based on the performance requirements of the project program, provide ANSI MH30.2 (see LOEDM) steel tread plate lip and platform, hinged and supported from beneath by steel framework that contains lifting, positioning, and lowering assembly. The design shall permit washing with water and detergents, and operation in an ambient temperature from 0 degrees F to plus 110 degrees F (–18 degrees C to plus 43 degrees C). Minimum roll over capacity shall be not less than 20,000 pounds (9,072 kg).

E103002 1.1.1 Height Adjustment

Provide a ramp with a minimum incline adjustment of 24 inches (600 mm). Divide 12 inches (300 mm) above and 12 inches (300 mm) below the platform height.

E103002 1.1.2 Loading Ramp Compensation

a. Freight Carrier Out of Level - Allow a minimum correction of one inch for each 18 inches (450 mm) and maximum of 4-inch (100 mm) correction of ramp width over the width of the ramp.
b. Loading and Unloading of the Freight Carrier - When the lip is extended, provide a 4-inch (100 mm) compensation for carrier spring deflection to allow full contact between the lip and the carrier bed.

E103002 1.1.3 Safety Devices

a. Electro-hydraulic System - Provide a device to automatically prevent a drop of more than 4 inches (100 mm) of the lip should the freight carrier move away from the dock leaving the lip unsupported.
b. Mechanical System - Provide a three-position safety system to limit platform fall to dock level and 4 and 8 inches (100 and 200 mm) below dock level.
c. Dock Bumpers - Provide laminated rubber, tire fabric or equivalent dock bumpers along the length of the loading dock.

E103002 1.1.4 Operation

a. Mechanical Control - Mechanical chain activated, with extension-spring operation and counter-balance non-manual, raising and lowering system.
b. Electro-Hydraulic Control - Provide dock leveler with pushbutton control, heavy-duty dust tight and oil tight rated

in accordance with NEMA ICS 2, Part ICS2-216 for alternating current.

c. Construction and Materials - The entire live load carrying surface of the ramp and rear attachment shall be not less than 1/4-inch(6 mm) thick, 55,000 PSI (379,200 kPa) minimum yield strength, low alloy, non-skid steel tread plate.

d. Toe Guards - Provide sides or edges of the ramps which rise above the surrounding loading dock with sheet carbon steel skirts or toe guards of minimum 14 gage nominal thickness.

E103002 1.1.5 Electro-Hydraulic Lift System

Provide a complete and separate system for each dock leveler. Design system to withstand not less than 150 percent of the design operating pressure. Provide hose, fittings, pipe and tubing with working pressures based upon a minimum 4 to 1 safety factor of bursting pressure.

E103002 1.1.6 Electrical Requirements

NFPA 70, NEMA ICS 2, NEMA ICS 6 and NEMA MG 1

a. Motor - Conform to NEMA MG 1 and continuous duty or 60-minute time rated, industrial type, single speed rated for operating conditions.

b. Control - NEMA ICS 2, size 0 controller for heavy industrial service.

c. Transformer - Totally enclosed, self-cooled, dry type transformer. Incorporate circuit breakers with ground fault interrupting protection conforming to UL 943.

E103002 1.1.7 Structural Warranty

Present a manufacturer's warranty certifying the leveler against operational malfunction or structural failure, or both, for a period of 10 years from the date of acceptance by the Government. Warranty may exclude failure through overloading evidenced by member breakage or residual deformation; but it may not exclude breakage of welds or fastenings, fatigue breakage of components, or wear of moving parts. Provide warranty to cover the full costs of repairs, or replacements in case of a nonrepairable failure.

E103002 1.1.8 Accessories

a. Dock Truck or Trailer Restraining Device - Provide self-aligning device, with a positive restraining force of not less than 18,000 pounds (8,165 kilograms). Device shall service all truck or trailers with ICC bars located between 12 and 30 inches (300 and 750 mm) above ground level.

E103003 WAREHOUSE EQUIPMENT

This paragraph covers the requirements for storage racks, heavy duty shelving, material handling conveyors, and other warehouse equipment. See the project program.

E103004 AUTOMOTIVE SHOP EQUIPMENT

This paragraph covers the requirements for automotive vehicle lifts meeting the requirements of ANSI/ALI ALCTV-1998 standards, and other automotive shop equipment such as pneumatic liquids delivery systems. See the project program.

E1040 GOVERNMENT FURNISHED EQUIPMENT

Refer to the project program.

E1090 OTHER EQUIPMENT

E109002 FOOD SERVICE EQUIPMENT

Provide Food Service Equipment and the kitchen design in accordance with FC 4-722-01N, *Navy and Marine CorpsDining Facilities*. This paragraph covers the items of commercial food service equipment. Included are items used for liquid and solid food storage, food preparation, cooking, display, serving, and clean up equipment. Provide 180 degree F (82 degree C) hot water or chemical treatment for sinks, dishwashers, pot washers, and exhaust ventilator wash down systems.

Provide products that meet or exceed the specified energy efficiency requirements of FEMP designated or Energy Star qualified products. Submit documentation certifying that products conform to Public Law 109-58 by meeting or exceeding Energy Star or FEMP efficiency requirements as defined at "Energy-Efficient Products" at http://femp.energy.gov/procurement . Indicate the Energy Efficiency Rating.

E109002 1.1 COMMERCIAL FOOD SERVICE EQUIPMENT

E109002 1.1.1 Equipment Materials

Fabricate custom and commercial equipment in accordance with NSP 2.

a. Stainless Steel Sheets - ASTM A167, 18-8 Composition, Type 302 or 304 or 316, non-magnetic, with a No. 4 finish on the exposed face.
b. Tubing - ASTM A 270
c. Framing and Cross Bracing - ASTM A 276, Type 302 or Type 304 or Type 316
d. Copper Tubing –

   1) Tube - ASTM B 88, Type K, annealed, for buried or embedment in concrete, and Type L, hard drawn, for above grade installation.

   2) Fittings - ANSI B16.18, above grade, ASME B16.22 or ASME B16.26, above or below grade.
e. Welded Joints - Use tungsten inert gas process. Use filler metal compatible with the material being welded. Make all visible welds ductile and of same color as adjoining surfaces. Coat welds in hidden areas that are not finished by grinding and polishing and the accompanying discoloration in the factory with a metallic-based paint to prevent progressive corrosion. Grind exposed welded joints flush with the adjoining material and finish and polish to match the adjoining surface. Grind

off excess metal and smooth to a No. 4 finish. Remove imperfections such as pits, runs, sputter, cracks, low spots, voids and buckle.

Penetrate entire thickness for the entire length of the joint; make joints flat, continuous and homogeneous with the sheet metal without reliance on straps under seams or spot welding. When stainless steel is joined to dissimilar metals, use stainless steel for fastening devices and welding material.

f. Solder - ASTM B 32, 95.5 tin-antimony solder or other lead-free solder for contact with potable water or food. Provide ASTM B 32, alloy grade 50B for temperatures up to 150 degrees Fahrenheit (65 degrees Celsius).

E109002 1.1.2 Custom-Fabricated Counters, Dishwasher Counters, and Sinks

Fabricate of 14 gage (1.8 mm) stainless steel, with all shop seams and water tight welded corners ground smooth, and polished. Pitch all flat surfaces to drain and eliminate any chance of standing water. Counters and sinks shall be furnished complete with integral stainless steel backsplashes, side splashes, and legs with adjustable feet.

a. Sinks - Provide integral sinks in accordance with the requirements of NSF 2, and ASTM A112.19.3M. Provide minimum of 0.75 inch (19 mm) radius on all corners.

E109002 1.1.3 Exhaust Ventilators

Exhaust ventilators shall conform to NFPA 96, UL 710, and SMACNA DCS. Fabricate exhaust ventilators of minimum 18 gage stainless steel in segments not longer than 12'-0". Provide centrifugal grease-extracting design to remove 95% of matter from the air with non-removable extracting baffles located in the plenum chamber. Exhaust ventilators shall provide integral make-up air system in accordance with NFPA 96. Provide automatic wash-down cycle and fan control on adjacent wall.

a. Fire Damper - Provide mechanically driven damper and damper control. Activate by heat-sensing thermostat set to react to a temperature of 350 degrees F (177 degrees C) in exhaust duct at exhaust ventilators.

b. Fire Protection System - Provide a pre-engineered wet system in accord with NFPA 96.

E109002 1.1.4 Pre-Fabricated Walk-in Refrigerators and Freezers

Provide walk-in units manufactured for food service use conforming to NSF 7, UL 207, and UL 471. Provide refrigeration unit complying with ASHRAE 15. Outside compressors, if used, require winter controls, housing, and crankcase heater. Provide monitoring system to alarm abnormally low or high temperatures, and personnel safety alarm. If the unit utilizes the floor of the facility as an interior surface of the unit, it shall be insulated and separated from adjacent floors.

E109002 1.1.5 Food Waste Disposer - ASTM F917

E109002 1.1.6 Beverage Dispenser, Non-Carbonated, Refrigerated - ASTM F918

E109002 1.1.7 Food Slicing Machine - ASTM F919

E109002 1.1.8 Food Mixing Machine - ASTM F952

E109002 1.1.9 Powdered Iced Tea Dispenser - ASTM F1023

E109002 1.1.10 Frying and Braising Pan, Tilting - ASTM F1047

E109002 1.1.11 Food Cutter - ASTM F1126

E109002 1.1.12 Food Waste Pulper - ASTM F1150

E109002 1.1.13 Cooker, Steam - ASTM F1217

E109002 1.1.14 Ovens, Microwave - ASTM F1360

E109002 1.1.15 Vegetable Peeling Machine - ASTM F1371-04

E109002 1.1.16 Combination Oven - ASTM F1495

E109002 1.1.17 Food Processor - ASTM F1568

E109002 1.1.18 Kettle, Steam Jacketed (20-200 gal) Floor or Wall Mounted - ASTM F1602

E109002 1.1.19 Kettle, Steam Jacketed (32 oz-20 gal), Table Mounted - ASTM F1603

E109002 1.1.20 Freezer, Ice Cream, Soft Serve - ASTM F1604

E109002 1.1.21 Griddle, Single or Double Sided - ASTM F1919

E109002 1.1.22 Deep Fat Fryers - ASTM F1963

E109002 1.1.23 Dough Divider/Rounder - ASTM F1966

E109002 1.1.24 Dishwashing Machines

a. Hot Water Sanitizing Rack Type, ASTM F857
b. Hot Water Sanitizing Single Tank, ASTM F858
c. Hot Water Sanitizing, Multi-Tank, ASTM F859
d. Hot Water Sanitizing, Multi-Tank, Conveyor, ASTM F860
e. Chemical Sanitizing, Stationary Rack, ASTM F953
f. Chemical Sanitizing, Fresh Water Rinse, ASTM F1022
g. Hot Water Sanitizing, Oval Conveyor, Multi-tank, ASTM F1237

E109002 1.1.25 Pot and Pan Washing Machines

a. Heat Sanitizing, Oscillating Arm Type, ASTM F1202
b. Heat Sanitizing, Rotary Conveyor, ASTM 1203
c. Heat Sanitizing, Rack Type, Rotary Spray, ASTM F1114

E109002 1.2 RESIDENTIAL OR LIGHT COMMERCIAL ELECTRIC KITCHEN EQUIPMENT

E109002 1.2.1 Cooking Top

Conform to UL 197 and UL 858.

E109002 1.2.2 Freezer

UL 250, minimum 14 cubic feet (0.39 cubic meters), frost-free.

E109002 1.2.3 Refrigerator

UL 250, refrigerator with frost-proof freezer, minimum 14.6 cubic feet (0.41 cubic meters).

E109002 1.2.4 Freestanding Ice Maker

UL listed and NSF approved; self-contained, air-cooled model, minimum ice production of 355 pounds (161 kg) per 24 hours, and a minimum bin storage capacity of 180 pounds (82 kg) of ice cubes.

E109002 1.2.5 Griddle

UL 197 and NSF 2, built-in counter-top model. Minimum capacity shall be 260 pancakes or 420 hamburgers 4 ounces (110 g) per hour.

E109002 1.2.6 Microwave Oven

UL 923, minimum 1 cubic foot (0.03 cubic meter) capacity.

E109002 1.2.7 Oven

UL 858, self-cleaning and built-in.

E109002 1.2.8 Trash Compactor

UL 1086, under-counter model with storage compartment and 20 gallon (75 liter) trash disposal bag capacity.

E109002 1.2.9 Kitchen Exhaust Hood

NFPA 96 and NSF 2, factory fabricated of minimum 18 gage stainless steel.

E109002 1.2.10 Range Hood

UL 858, vented or non-vented with two-speed fan.

E109002 1.2.11 Dishwasher

UL 921 or UL 749 with detergent dispenser. For heavy-duty dishwasher, provide stainless steel commercial grade with approximately 300-dish per hour and 540 glasses per hour ratings.

E109002 1.2.12 Residential Garbage Disposal

UL 430, stainless steel, continuous feed with minimum 1/2 or 3/4 hp motor. Optional 1 hp motor for heavy usage.

E109005 UNIT KITCHENS

E109005 1.1 UNIT KITCHENS

Unit kitchens must be complete with countertops, sinks, faucets, appliances, and accessories. Comply with DoD ABAAS in units for the disabled. Provide high pressure laminate or natural wood finish.

E109005 1.2 UNIT KITCHEN COMPONENTS

a. Cabinets - ANSI/FCMA A161.1 wood and plywood cabinetry with drainers and cabinet doors.

   1) Provide 3/4-inch (19 mm) solid wood for face framing, drawer fronts, and shelves up to 36 inch (91.44 cm) wide. Cabinet body members require spline, biscuit, dowel or dado joining.

   2) Provide 1/2-inch (12.8 mm) solid wood for drawer boxes with dovetail or dowelled joints.

   3) Provide 3/8-inch (9 mm) plywood for cabinet box and toe board.

   4) Provide cabinet doors of High Pressure Laminate covered medium density fiberboard or stile and rail doors.

b. Countertop - Provide ASTM 2124.3 and ASTM 2124.6, solid polymer countertop and 3-1/2 inch (89 mm) backsplash.

c. Sink and Faucet - Provide ANSI A112.18.1M, NSF International Standard 61 sink and faucet. Section 9 for sink and faucet. Provide large 22 gauge stainless steel sink with basket strainer in w with water stopper. Faucet shall be a washerless cartridge system

d. Refrigerator-Freezer – 5 cubic foot minimum undercounter refrigerator freezer. Provide interior light, defrost, adjustable shelving, adjustable thermostat features, and zero degree freezer.

e. Microwave Oven/Ventilation Hood Combination. Provide 1.4 cubic foot 900 watt minimum, microwave/hood above cooktop. Ductless hood must be convertible to ducted at the project site.

f. Cooktop – Provide drop-in 2 burner black ceramic cooktop with 1200 watt elements.

g. Dishwasher – Provide 24 inch wide Energy Star Large capacity dishwasher.

h. Accessories

   1) Back wall shield and end wall shields when against an end wall.

   2) Countertop fluorescent lighting.

   3) Drawer slides rated for 100 pound capacity.

   4) Door hinges to be adjustable, self-closing, and configured to allow screw application to cabinet door from two directions.

E109090 OTHER SPECIALIZED FIXED AND MOVABLE EQUIPMENT

Specialized fixed and moveable equipment not described by the other assembly categories.

E109090 1.1 WEAPONS RACKS

Weapons Storage Racks may be purchased or may be steel fabrications. Comply with OPNAVINST 5530.13c and standard operating procedure for the facility.

E109090 1.2 GEAR DRYING CAGES

Drying cages (racks) for SCUBA gear may be purchased or may be fabrications. Comply with standard operating procedures for the facility.

-- End of Section --

SECTION E20

FURNISHINGS
09/15

E20 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

E20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award:

E20 1.1.1 Industry Standards and Codes

E20 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, ArchitectureUFC 3-120-10, Interior Design)
UFC 1-200-02	High Performance and Sustainable Buildings

E20 1.2 GENERAL REQUIREMENTS

The Contractor shall have an Interior Designer, certified by the National Council for Interior Design Qualification (NCIDQ), or a state and/or jurisdiction Certified, Registered, or Licensed Interior Designer prepare both the FF&E and the SID Package, attend and participate, in entirety, all

kick-off meetings, design meetings, to include, but not limited to, design charettes, concept design workshops, and review meetings to develop the building design, floor plan, and the FF&E package. As required, the Contractor shall obtain services of equipment specialists to specify the audiovisual, shop, or specialty equipment. The Interior Designer and any specialists shall not be affiliated with any furniture dealership/vendor or manufacturer. The Government Interior Designer reserves the right to approve/disapprove the qualifications of the Contractor's Interior Designer.

Systems furnishings installers must be the systems furniture manufacturer's approved dealer of record. In addition, installation dealers must be located within a 100 mile radius of the project site unless approved by the government Interior Designer.

[Contractor to re-purpose/ recycle existing furniture if not relocated by the government. Contractor to provide verification that the existing furniture was not disposed of at the landfill.]

E20 1.3 DESIGN SUBMITTALS

Design Submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, and UFC 3-120-10, *Interior Design*.

E20 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

Art work and FF&E Package

E2010 FIXED FURNISHINGS

E201001 FIXED ARTWORK

E201002 WINDOW TREATMENTS

Provide interior window coverings, associated hardware and controls at each exterior window and at any interior view window where privacy may be required. Refer to the Project Program for size, pattern and style of window treatments. At a minimum, functional window coverings such as blinds or solar shades are required on all projects.

E201002 1.1 BLINDS

Venetian blinds shall be one-inch horizontal room-darkening commercial grade aluminum at a minimum thickness of 0.2mm (.008") (after coating) with a minimum of 45.72 slats per meter (15 slats per foot). Blinds shall be provided at each exterior window and at any interior window where privacy

may be required. One full size sample shall be provided and installed for review and approval.

E201002 1.2 SHADES

Provide energy efficient solar shading systems for exterior windows. The system shall maintain visibility while reducing glare, solar heat gain during the summer and heat loss during the winter. Openness configuration shall be no more than 5% for most areas. The system fabrics and components shall be dimensionally stable and shall be manufactured to withstand fading, fire, mildew, and soiling.

E201002 1.3 DRAPERIES AND HARDWARE

Draperies shall be manufactured under GSA contract as part of FF&E. Drapery can be accordion-fold, ripple-fold, or pinch-pleat with associated hardware suitable for the project requirements. All draperies shall meet the NFPA Code 701 California Fire Marshall’s flame retardant requirements.

E201003 SEATING (FIXED)

E201003 1.1 AUDITORIUM, LECTURE AND CLASSROOM SEATING

The system shall permit the standards to be installed on radial lines from a common center for which concentric circles are determined with each row of units utilizing common middle standards. Standards in each row shall be placed laterally so the aisle-end standards will be in alignment as indicated on seating layout drawing. The angle of inclination of backs shall be adjusted for variations in sightlines. Mechanical attachment of components shall be of sufficient flexibility so that when permanently assembled they will compensate for the changing dimensions laterally between standards caused by convergence toward the center. Seat and back attachments shall absorb inaccuracies in lateral spacing of standards at point of attachment caused by unevenness of floor. Varying lateral dimensions of backs and seats shall be in accordance with approved seating layout. Minimum width of seating unit shall be 20 inches and may be used only to complete a specific row dimension.

E201003 1.2 FIXED TABLES FOR AUDITORIUM, LECTURE AND CLASSROOMS

Provide worksurfaces mounted to floor standards shall be tubular steel, sheet steel, or cast iron. The standards shall be formed to fit the floor incline so that the standards will be vertical. The feet shall be formed to eliminate tripping hazards and shall have holes for bolt attachment to the floor. Provide riser standards, cantilevered standards and aisle and end standards as required. Provide communications, data and power routing as required. Provide a high-pressure plastic laminate over medium density particleboard for the worksurfaces with coordinating vinyl or resin edge detail.

E2020 MOVABLE FURNISHINGS

Furnishings, Fixtures, and Equipment (FF&E) shall include furniture, shop equipment, audiovisual equipment, and specialty equipment. Weapon racks, drying cages, and lockers are not considered FF&E. FF&E shall be fully integrated with the building systems and finishes. FF&E may also include specialty items for which

the customer activity shall be responsible for specifying.

Design and provide as required FF&E for all areas as developed during client programming. Design an FF&E package and prepare supporting plans and procurement data in accordance with the general interior design requirements in UFC 3-120-10.

E2020 1.1 FF&E PACKAGE

FF&E Package: Design and provide a fully usable and complete facility to include a FF&E movable furnishings package from Government supply sources according to Federal Acquisition Regulations. The FF&E will include, but not limited to, systems and modular furniture, training and conference furniture, seating, tables, artwork, decorative window covering, specialty furniture and equipment, dormitory room furnishings, and accessories. NAVSUP Blanket Purchase Agreements (BPA) must be used whenever possible. The government will provide separate funding for the FF&E package. Construction funds will not be used. The FF&E Package must include shipping, freight, handling, installation and the HAR percentage as applied to the final FF&E total cost.

E2020 1.1.1 Authorization

The government will provide separate funding for procurement of the FF&E package. Upon receipt of required funding, the Contractor shall be authorized by the Contracting Officer as a planned line item modification to the contract/task order to procure all FF&E using predominately negotiated Federal contracts. The amount of the modification will be the actual cost of these items from the Federal price schedules or NAVSUP BPAs, including any freight and installation charges from the furniture supplier as well as the contractor's FF&E Handling and Administration Rate (HAR). The HAR includes all of the prime contractor's effort related to storage, coordination, handling, administration of subcontractors, and all other associated costs and profit for the procurement of FF&E. The prime contractor will propose in the contract/task order solicitation the FF&E HAR. The contractor's proposed HAR may not exceed 5% of the total FF&E costs, as noted on the bid schedule. No other charges, expenses, fees, markups, etc will be authorized.

The government Interior Designer will approve the final FF&E submittal. The FF&E package will be presented to the Contracting Officer and the Contractor shall provide the FF&E exactly as specified and approved.

The Contractor will receive a letter of authorization from the Contracting Officer citing the name of the furniture dealer and other information to use when accessing the government supply sources.

E2020 1.2 PURCHASE AND INSTALLATION

The Contractor shall coordinate the building completion date with the installation dealer specified in the FF&E Package. The Contractor or contractor's representative is responsible for the following: issuing purchase orders, receiving acknowledgements, sending copies of purchase orders to the installation dealer(s) specified in the FF&E package, and providing necessary deposits to furniture manufacturers.

The FF&E installation dealer(s) is responsible for the following: Receiving and installing all FF&E specified in the FF&E package, coordinating delivery and installation with the Contractor, inspecting for damage, providing delivery receipts to the Contractor, filing necessary freight claims, hanging artwork, bulletin boards, etc., removing packaging material, cleaning up the site upon completion, and adhering to Contractor's safety requirements.

E2020 1.2.1 Use of GSA Schedules and Blanket Purchase Agreements (BPAs)

The prime contractor or FF&E dealer will be authorized to purchase supplies or services from the Navy Furniture BPAs for FF&E requirements, under the terms of the contract. The Contractor will receive a letter of authorization from the Contracting Officer citing the name of the furniture dealer and other information to use when accessing the government supply sources or BPAs.

E2020 1.2.2 Deposits

The Contractor should anticipate providing a deposit of between 30% to 50% of the furniture costs when placing their order.

The Contractor shall also anticipate possible manufacturer price increases. Recommend ordering FF&E product once funds are received to avoid incurring additional costs. Delayed production and delivery dates can be noted at the time of order placement to coincide with building completion dates. Any costs incurred due to manufacturer price increases will be the burden of the contractor.

E2020 1.2.3 Davis Bacon Wages

Davis Bacon wages do not apply to the FF&E installer from the government supply sources. The workforce for the FF&E installation and delivery shall be separate and distinct from the labor workforce performing under the construction contract.

E2020 1.2.4 Sales Tax

Exemptions for certain State or Local taxes may be available to the contractor and/or its subcontractors. The contractor shall take maximum advantage of all exemptions, including obtaining a resale permit, from State and Local taxation authorities whether available to it directly or available to the contractor based on an exemption afforded the government. The responsibility for paying applicable taxes rests with the contractor. State and local taxes applicable to the FF&E line will be included with the subcontractor's quote, if applicable.

E2020 1.2.5 Bonds

FF&E line item is not considered construction and the prime contractor shall not be required to secure any additional bond for the award of the FF&E line item unless otherwise indicated in the RFP. If any additional bond is required for the FF&E line item it is to be included in the prime contctor's FF&E HAR.

E2020 1.2.6 Unique Item Identification (IUID) and Validation

Unique item identification and valuation is a system of marking and valuing items delivered to DoD that enhances logistics, contracting, and financial business transactions. The IUID policy is mandatory for all DoD contracts that require the delivery of items. An item is a single article or a single unit formed by a grouping of subassemblies, components or constituent parts. The contractor shall provide DoD Unique item identification, valuation and delivery of data for all required FF&E items for which the government's unit acquisition cost is $5,000 or more.

E2020 1.2.7 Buy American Act and Trade Agreement Act

All supplies under the FF&E line item are subject to the Buy American Act and Trade Agreement Act (TAA). The GSA contracts and NAVSUP Blanket Purchase Agreements are required to comply with the Buy American Act and TAA.

E2020 1.2.8 Small Business Requirements

The FF&E is subject to the Contractor's Small Business Goals however the government requires the furniture be purchased from NAVSUP Blanket Purchase Agreements (BPA). Most manufacturers on the Office Furniture BPA are large business and most manufacturers on the Dorm and Quarters BPA are small business. Installation dealers are small business. Under the terms of the BPA, the FF&E must be ordered directly through the GSA manufacturer. Using pass-through companies to achieve Small Business Goals will not provide the Contractor credit unless they manufacturer 20% or provide 50% of the service purchased. The government will not incur additional costs to use small business.

E2020 1.2.9 Installation

The FF&E package includes the installation of all furniture and furnishings as specified in the FF&E package. The installation dealer specified in the FF&E package will receive, store, if required, transport to the project site, off load, inside deliver, unpack, assemble, place/install, clean, if required, and dispose of all the trash for all furniture and furnishings. The Contractor's Interior Designer shall be responsible for specifying installation services and warehousing, as required, for all collateral equipment. It is the Contractor's responsibility to coordinate the building completion, occupancy, and furniture installation dates with the installation dealer specified in the FF&E package. Any costs associated with storing or delaying furniture shipments is the responsibility of the construction contractor.

E2020 1.2.10 Installation Warranty

All movable furnishings shall be installed in accordance with the manufacturer’s instructions and warranty requirements. All movable furnishings shall be level and aligned and all doors, drawers and accessories shall be level and aligned to open, close and otherwise operate smoothly and securely. All systems furniture shall be installed by the systems furniture manufacturer’s dealer of record

and not the General Contractor. The Contractor shall repair, to the customer’s satisfaction, any/all damage to any facility finish that is a result of the furniture installation and correct all punch list items for the furniture/furnishings.

E2020 1.2.11 Ordering Documentation

Two copies of all ordering documentation shall be provided to the Contracting Officer including Factory Order number (FO) and warranty information.

E2020 1.2.12 Post Award Changes

After award of the FF&E line item modification, any request to change the FF&E items must be submitted on the Contracting Officer. The FF&E modification has been accepted, priced, and negotiated based on specific line items as detailed in the final package. Those items have been agreed to considering color, specific type and quality of material, price, sustainability, life cycle, and dealership service. The Government will expect and require the contractor to provide exactly those items. Should changes become necessary, careful consideration is required to ensure that equivalent quality, price and other aspects of the item is maintained. Otherwise, price adjustments must be negotiated. The Contracting Officer will obtain approval from the Government Interior Designer/Collateral Equipment Manager in consultation with the client for any changes to the FF&E.

Post award FF&E manufacturer's price increases are the responsibility of the Contractor and shall not be transferred to the government. Recommend ordering FF&E product once funds are received to avoid incurring additional costs. Delayed production and delivery dates can be noted at the time of order placement to coincide with building completion dates.

E2020 1.3 BEST VALUE DETERMINATION

A best value determination is required by FAR 8.404 when placing orders against Federal Supply Schedules for the selection of furniture and furnishings. A BVD must also be provided for FF&E installation services. Best Value is defined in FAR 2.101 as ensuring that the order to be placed under a Federal Supply Schedule results in the lowest overall cost alternative (considering price, special features, administrative costs and client's needs) to meet the government's needs.

The Contractor's Interior Designer is responsible for the following written BVD justifications:

$3,000 or less: For any procurement in the FF&E package with a value of $3,000 or less, the interior designer may utilize any BPA holder. If the BPA holders cannot supply the item, then any other manufacturer may be utilized.

Greater than $3,000 and $150,000 or less: for any procurement in the FF&E package with a value greater than $3,000 and $150,000 or less, the contractor's interior designer shall always review pricing from at least three manufacturers as well as UNICOR. In addition to the review of

published list prices, the contractor's interior designer must confirm the pricing with the vendor. Manufacturer's quotes are NOT required. The BVD form must be completed and submitted for all FF&E procurements greater than $3,000 and $150,000 or less.

Greater than $150,000: The contractor's interior designer shall solicit proposals from all BPA holders under the applicable group for FF&E procurements greater than $150,000. UNICOR must always be solicited. The contractor's interior designer shall develop performance criteria and project requirements based on a generic design for the BPA holders and UNICOR to develop a price and performance proposal. The BVD form must be completed and submitted for all FF&E procurements greater than $150,000 and manufacturer's quotes and a summary of all proposals must be attached.

Federal Prison Industries (UNICOR) must be considered as part of all BVDs. This must be done by sending an email with the requirements and evaluation criteria if they are not comparable in one or more areas of price, quality, and time of delivery, the designer can specify product under NAVSUP BPA or GSA schedule.

The best value determination shall address issues such as space planning; human factors data related to anthropometrics (reach, clearance, adjustability), space, and acoustics; ergonomics; product quality (including construction and materials); sustainability features, product warranties; history of the product and/or manufacturer; ability to service products through dealers or others within a certain geographical range of the project; price (including freight); aesthetics; appropriateness; and lighting, power and telecommunications systems management and/or coordination as related to the facility (when applicable); and other project specific factors as identified and/or required. Emphasis shall be to create a fully integrated design solution by providing quality products to meet the functional needs of the customer. Customer preferences shall be considered. The focus shall be on the best overall value. Use the GSA Best Value Determination forms provided in Part 6 of this RFP as guidelines for information to be provided.

E202001 MOVABLE ART WORK

The Contractor shall provide artwork for wall installation as part of the FF&E Submittal according to the project program. Installation of artwork to be completed by installation dealer specified in the approved FF&E package. Type of artwork to be determined by client requirements and budget as described in the Project Program for the project. Install framed artwork 63 inches (1600 mm) on center above finished floor. Include security mounting hardware as required.

E202002 MODULAR PREFABRICATED FURNITURE

E202002 1.1 FURNITURE SYSTEMS

Provide products that meet the NAVFAC performance specifications for systems furniture. The Government Interior Designer must approve any other systems furniture manufacturer. The typical workstation shall maximize each allocated space with worksurfaces and overhead closed storage with a surface to accommodate a Government provided computer. An attached articulated keyboard/mouse tray shall be selected or provided. Provide a monitor lift if required by the project program.

Powered raceways that will accommodate data and voice wire management shall be completely coordinated with all facility systems. The Contractor's Interior Designer shall ensure the coordination of all electrical/data and furniture locations. Use of power poles will not be permitted to power FF&E. The Contractor shall provide and coordinate all telecommunication receptacles and outlet requirements (i.e. RJ 11/45 receptacles and cover plates) with the Contractor's Interior Designer and the systems furniture installer. The Contractor shall hardwire all pre-wired furniture with the building systems, and coordinate all IT and telephone connections.

E202002 1.2 MODULAR FREESTANDING FURNITURE AND WORKSTATIONS

Provide products that meet the NAVFAC performance specifications for modular freestanding furniture including wood. Provide modular furniture with electrical/data cable trays and grommet holes for private offices and smaller work areas. An attached articulated keyboard/mouse tray (and monitor lift if required by the project program) shall be selected. Wood surfaces shall be provided as appropriate. Include accommodation for a Government provided computer and printer.

E202003 FREESTANDING FURNITURE

E202003 1.1 SEATING

E202003 1.1.1 Task Seating

Provide task seating that is fully ergonomic and coordinated by finish and scale to the workstation. Seating specifications to include: adjustable arms, back, height, and seat pan; 5 star base, appropriate castors for floor surface, lumbar support and availability in a minimum of two (2) sizes. Task seating can be from the same manufacturer as the systems or major furniture supplier or other seating manufacturer as approved by the government Interior Designer, provided it is determined to be a BPA "Best Value".

E202003 1.1.2 Lounge, Reception and Guest Seating

Provide lounge, reception and guest seating with upholsteries consistent with the Project Program. Seating shall be easily reupholstered or have removable covers.

E202003 1.1.3 Training Room Seating

Provide seating with passive ergonomic features in that the seat and back offers some synchronized movement to allow the person seated to change positions. The support can be legs, sled base or single pedestal with 5 star base and casters as determined by user requirements. Provide high density stack chairs or nesting chairs as required. Provide attached, storable tablet arm as required.

E202003 1.2 STORAGE AND FILING

Provide freestanding storage units, file cabinets and file safes to accommodate the specific and unique storage requirements of the user. Coordinate closely with storage provided in PTS Section E10, Equipment, for high density filing.

E202003 1.3 CHILD DEVELOPMENT CENTERS

Provide all child care and classroom furnishings such as cribs, rocking chairs, feeding chairs, tables, seating, toy storage, book display storage, activity centers, freestanding floor activity toys, and any other required furnishings. Outdoor structural play equipment may be required. The cribs shall be of stainless steel construction. The chairs and tables shall be appropriately sized for each age group.

E202003 1.4 TRAINING/CONFERENCE ROOM FURNISHINGS

E202003 1.4.1 Tables

Provide single or multi-person worksurfaces or tables as determined from user requirements. Where computers are used, provide tables with wire management capability or pre-wired tables to accommodate data/telecommunications requirements. Powered raceways that will accommodate data and voice wire management shall be completely coordinated with all facility systems. The Contractor's Interior Designer shall ensure the coordination of all electrical/data and furniture locations. The Contractor shall provide and coordinate all telecommunication receptacles and outlet requirements, hardwire all pre-wired furniture with the building systems and coordinate all IT and telephone connections.

E202003 1.4.2 Movable Presentation Furnishings

Provide audio-visual carts, lecterns, multi-media presentation cabinets to accommodate power/data requirements.

E202003 1.5 DINING ROOM FURNISHINGS

E202003 1.5.1 Cafeteria, Dining Hall Furnishings

Provide stackable seating and associated dollies for transport and storage, tables with folding or fixed legs or flip tops, and associated mobile carts for transport and storage, and trash and recycling containers.

E202003 1.5.2 Executive Dining Furnishings

Provide premium quality dining furnishings to include tables, chairs, buffet and serving units, hutches and cabinets as require by the Project Program.

E202004 RUGS & ACCESSORIES

E202004 1.1 RUGS

Provide Area or Accent rugs. Refer to the Project Program for requirements.

E202004 1.2 LAMPS

Provide decorative lamps. Refer to the Project Program for requirements.

E202004 1.3 INTERIOR LANDSCAPING

Provide artificial plants of a variety of sizes and 'species' to provide interior landscaping, including planters or containers for artificial plants to coordinate with the interior finishes and furnishings of the project.

E202004 1.4 OTHER DECORATIVE ITEMS

Refer to the Project Program for requirements.

E202090 OTHER MOVABLE FURNISHINGS

E202090 1.1 MISCELLANEOUS ITEMS

E202090 1.1.1 Containers

Provide waste receptacles, recycling containers, and ash urns as required.

E202090 1.1.2 Accessories

Provide clocks, wall mounted or freestanding literature and coat racks, and mirrors as required.

E202090 1.1.3 Small Equipment

Provide small appliances such as coffee pots, microwaves, refrigerators, washers, dryers, and icemakers, as required.

E202090 1.1.4 Special Equipment

Provide mailroom work and storage tables, mail sorter units, carts and equipment tables as required.

-- End of Section --

SECTION F10

SPECIAL CONSTRUCTION
09/15

F10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

F10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

F10 1.1.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, ArchitectureUFC 3-301-01, Structural Engineering)
UFC 1-200-02	High Performance and Sustainable Buildings

F10 1.2 PERFORMANCE VERTIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory special construction system performance shall be via Performance Verification Testing, as detailed in this section of the RFP. Provide special tests and special inspections in accordance with UFGS Section 01 45 00.05 20, *Design and Construction Quality Control*.

F10 1.3 DESIGN SUBMITTALS

Design submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-101-01, *Architecture*, and UFC 3-301-01, *Structural Engineering*.

F10 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following submittals as a minimum:

All structural elements necessary for construction.

For a pre-engineered metal building, provide shop drawings showing engineering data and complete building drawings, signed and sealed by a registered professional engineer.

F1010 SPECIAL STRUCTURES

F101001 METAL BUILDING SYSTEMS

F101001 1.1 DESIGN REQUIREMENTS

The metal building manufacturer shall be accredited in accordance with all Parts of the Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems (AC472) by the International Accreditation Service, Inc. The Metal Building System design shall be in accordance with the Metal Building Manufacturers Association (MBMA) Low Rise Manual.

All structural design shall comply with the provisions of PTS Section B10, Superstructure. The steel structure shall be as designed by the structural engineer. If used for thrust bracing, tie rods shall be concrete encased. Design framed openings structurally.

F101001 1.1.1 Additional Roof Design Requirements

a. Roof Decking – In addition to any other load requirements, roof decking shall be designed to support a 200-pound (91 kg) concentrated load at mid-span on a 12-inch (300 mm) wide section of deck.
b. When used as a diaphragm, roof decks shall be designed in accordance with SDEI DDM.

F101001 1.1.2 Deflection

a. Structural Members

1) Maximum deflection of main framing members and for roof members shall not exceed values required by the IBC.

2) Purlins and Roof Panels: The deflection due to live, snow, or wind shall not exceed L/180. The Basis of Design shall establish that the roof when deflected under dead plus live or

snow loads will not result in a negative gradient. Maximum deflections shall be based on sheets continuous across two or more supports with sheets unfastened and free to deflect. Provide bracing of purlin compression flanges as required to resist applied loading.

b. Wall Panels - Maximum deflection of wall panels due to wind loads shall be as required by the IBC and UFC.

F101001 1.2 WALL AND ROOF MATERIALS

F101001 1.2.1 Aluminum/Zinc-Coated Steel Sheet

ASTM A792/ A792M, AZ 55.

F101001 1.2.2 Aluminum Sheet

Alloy 3004 Alclad conforming to ASTM B209.

F101001 1.3 FRAMING AND STRUCTURAL MEMBERS

F101001 1.3.1 Steel

ASTM A992 / A992M, ASTM A529/ A529M, ASTM A572/ A572M, or ASTM A588/ A588M.

F101001 1.3.2 Aluminum

ASTM B221 or ASTM C308.

F101001 1.3.3 Structural Tube

ASTM A500 or ASTM B221.

F101001 1.4 MISCELLANEOUS ITEMS

F101001 1.4.1 Fasteners

Fasteners shall be compatible with the materials they are fastening to, be gasketed when exposed to weather to prevent leaks, and shall provide both shear and tensile strengths not less than 750 pounds (3,336 N) per fastener. The main fastening system shall use concealed fasteners, however, when exposed fasteners are needed, color fasteners shall be color coated to match wall/roof panels.

F101001 1.4.2 Light Transmitting Roof Panels (Non-Insulated)

ASTM D3841, Type II, Grade 1

F101001 1.4.3 Insulation

Blanket-type fiberglass insulation with a factory applied facing on one side and having a permeance rating of 0.05 or less in accordance with ASTM E96.

a. Flame Spread Rating 75 or less, and a Smoke Developed Rating of 150 or less when tested in accordance with ASTM E84.

b. Insulation R-value in accordance with ASTM C236 as determined by energy use analysis or identified in the RFP.

F101001 1.5 FINISH

Factory Color Finish - Provide factory applied baked coatings to the exterior and interior of metal wall panels and metal accessories. Provide exterior finish top coat of 70 percent inorganic pigments with 0.8 mil dry film thickness (DFT). Provide exterior primer standard with panel manufacturer but not less than 0.8 mil DFT over the color topcoat and edge coating for projects within 300 feet (91 meters) of a water shoreline or industrial environments. Field apply 70 percent PVDF clear coat to unfinished panel edges or field cut panels. Interior finish exposed to sun or rain shall be the same coating and DFT as the exterior coating. Interior finish protected from sun or rain exposure shall receive 1.0 mil DFT coating of siliconized polyester (SMP) resin coating with organic or blended pigments and manufacturer’s standard primer.

F1030 SPECIAL CONSTRUCTION SYSTEMS

F103001 VAULTS

This paragraph is for prefabricated vaults. See PTS Section E10, Equipment, for vault doors and day gates.

-- End of Section --

SECTION F20

SELECTIVE BUILDING DEMOLITION
09/15

F20 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

F20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and government standards that are referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website , are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

F20 1.1.1 Industry Standards

Refer to UMRL for reference designation identification.

F20 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-101-01, Architecture)
UFC 1-200-02	High Performance and Sustainable Buildings
UFC 3-800-10N	Environmental Engineering for Facility Construction

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 01 57 19.00 20	Temporary Environmental Controls
UFGS 01 57 19.01 20	Supplementary Temporary Environmental Controls
UFGS 02 82 14.00 10	Asbestos Hazard Control Activities
UFGS 02 82 16.00 20	Engineering Control of Asbestos Containing Materials
UFGS 02 83 19.00 10	Lead Based Paint Hazard Abatement, Target Housing and Child Occupied Facilities
UFGS 02 85 00.00 20	Mold Remediation

U.S. ARMY CORPS of ENGINEERS (USACE)

EM 385 -1-1	(2008) Safety -- Safety and Health Requirements or latest edition including changes

F20 1.2 QUALITY ASSURANCE

Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards prior to acceptance of the work. Items found not to be in compliance shall be removed, or corrective measures taken, to assure compliance with the referenced standard. Disposal of materials shall be as specified and performed in a manner to protect workers and existing structures to remain.

F20 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE CRITERIA

Compliance with the requirements will be determined by a review of the design and construction submittals and by field inspection. See UFGS Section 01 33 10.05 20, *Design Submittal Procedures*, and UFGS Section 01 33 00.05 20, *Construction Submittal Procedures*, for additional requirements.

F20 1.4 DESIGN SUBMITTALS

Design Submittals shall be in accordance with Z10, *General Performance Technical Specifications*, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, and UFC 3-800-10N, *Environmental Engineering for Facility Construction*.

F20 1.5 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements and if applicable to this project, the Designer of Record (DOR) shall obtain governing body approval for the construction submittals contained in the following UFGS sections and USACE Safety Manual as a minimum:

UFGS 01 57 19.05 20, *Temporary Environmental Controls for Design-Build*

UFGS 01 57 19.01 20, *Supplementary Temporary Environmental Controls*

UFGS 02 82 14.00 10, *Asbestos Hazard Control Activities*

UFGS 02 82 14.00 20, *Engineering Control of Asbestos Containing Materials*

UFGS 02 85 00.00 20, *Mold Remediation*

EM 385-1-1, *Safety and Health Requirements*, latest edition including changes

a. Engineering Safety Survey

b. Demolition Plan/ Deconstruction Plan

F2010 BUILDING ELEMENTS DEMOLITION

All demolition materials and appurtenances shall be properly disposed and in accordance with all applicable regulations. Maximize the use of deconstruction and recycling services. Before demolition can commence, any hazardous materials shall be abated in accordance with the requirements of the ESR and other parts of the RFP. Provide a Demolition Plan/ Deconstruction Plan that is based on a Registered Engineers Survey in accordance with EM 385-1-1 and has been approved by the DOR. The Contractor shall obtain approval from the Contracting Officer for the proposed demolition plan and work/outage schedule prior to demolition activities.

F2010 1.1 GENERAL DEMOLITION

The work includes demolition, salvage of identified items and materials and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed. Materials that cannot be removed daily shall be stored in areas specified in the approved Demolition Plan as described in UFGS 01 57 19.00 20.

F2010 1.2 UTILITIES

Remove existing utilities and terminate in a manner conforming to the nationally recognized code covering the specific utility. Disturbance to utilities can not cause a failure to utilities to remain operational, unless a planned outage is approved by the FEAD/ROICC and coordinated with on-site personnel.

F2010 1.3 DUST CONTROL

Perform dust control activities in accordance with approved Dirt and Dust Control Plan as described in UFGS 01 57 19.00 20.

F2010 1.4 TRAFFIC CONTROL

Where pedestrian, vehicle, aircraft safety is endangered, use traffic

barricades.

F2010 1.5 WEATHER PROTECTION

For portions of the building to remain, protect building interior, materials, and equipment from weather at all times.

F2010 1.6 BURNING

Perform burning operations in accordance with the ESR.

F201001 SUBSTRUCTURE & SUPERSTRUCTURE

Perform substructure or superstructure demolition work in accordance with the ESR.

F201002 EXTERIOR CLOSURE

Perform exterior closure demolition work in accordance with the ESR.

For occupied buildings ensure openings to the exterior are secured by the end of the work shift.

F201003 ROOFING

Perform roofing demolition work in accordance with the ESR.

For removal and re-roofing projects, remove only as much roofing as can be re-covered by the end of the work shift.

F201004 INTERIOR CONSTRUCTION & FINISHES

Perform interior construction & finishes demolition in accordance with the ESR.

F201005 CONVEYING SYSTEMS

Perform conveying systems demolition in accordance with the ESR.

F201006 MECHANICAL SYSTEMS

Perform mechanical systems demolition in accordance with the ESR.

F201007 ELECTRICAL SYSTEMS

Perform electrical systems demolition in accordance with the ESR.

F201008 EQUIPMENT & FURNISHINGS

Perform special equipment and furnishing demolition in accordance with the ESR.

F201009 OTHER NON-HAZARDOUS SELECTIVE BUILDING DEMOLITION

Perform non-hazardous selective building demolition in accordance with the ESR.

F2020 HAZARDOUS COMPONENTS ABATEMENT

Prior to starting work, conduct any additional testing that may be needed to provide

a final design and comply with all applicable Federal, regional, state and local regulations. Refer to UFC 3-800-10N, *Environmental Engineering for Facility Construction*, for restrictions and for additional requirements and criteria.

F2020 1.1 PRIVATE QUALIFIED PERSON (PQP)

The PQP must perform independent inspections, testing and verification of the hazardous components work as indicated in the ESR and the approved work plans as described in UFGS 01 57 19.00 20. The PQP shall be appropriately licensed in the state in which the work will be performed.

F2020 1.2 FURNISHINGS

The government shall remove all uncontaminated furnishings and equipment from the work area prior to the start of the work.

F2020 1.3 ASBESTOS

Perform asbestos related work as indicated in the RFP, in accordance with the ESR, and the approved asbestos removal work plan as described in UFGS 01 57 19.00 20.

For asbestos work in DoD schools the Designer of Record shall edit UFGS 02 82 14.00 10, *Asbestos Hazard Control Activities*, as described in UFGS 01 57 19.00 20. The Designer of Record must be an EPA accredited Asbestos Project Designer. Perform asbestos related work in DoD schools in accordance with the approved edited UFGS 02 82 14.00 10.

F2020 1.4 LEAD BASED PAINT

Perform lead based paint related work as indicated in the RFP, in accordance with the ESR and the approved lead based paint removal work plan as described in UFGS 01 57 19.00 20.

All federal, state and local regulations regarding lead based paint within a child occupied facility must be followed. For lead based paint work performed in child occupied facilities the Designer of Record shall edit UFGS 02 83 19.00 10, *Lead Based Paint Hazard Abatement, Target Housing and Child Occupied Facilities*, as described in UFGS 01 57 19.00 20. The Designer of Record must be an EPA accredited Lead Project Designer. Perform lead based paint related work in child occupied facilities in accordance with the approved edited UFGS 02 82 14.00 10.

F2020 1.5 PAINT RELATED WORK

Perform paint related work as indicated in the RFP, in accordance with the ESR and the approved paint removal work plan as described in UFGS 01 57 19.00 20.

F2020 1.6 MERCURY & LLR COMPONENTS

Perform work as indicated in the RFP, in accordance with the ESR and the approved mercury & LLR components removal work plan as described in UFGS 01 57 19.00 20.

F2020 1.7 PCB'S

Perform PCB related work as indicated in the RFP, in accordance with the ESR and the approved PCB removal work plan as described in UFGS 01 57 19.00 20. Notify the contracting officer immediately on discovery of any equipment leaking PCB containing fluid. Take reasonable preventative measures to contain the leak and prevent movement of the PCB containing fluids.

F2020 1.8 ODS

Perform ODS related work as indicated in the RFP, in accordance with the ESR and the approved ODS removal work plan as described in UFGS 01 57 19.00 20.

F2020 1.9 ANIMAL DROPPINGS

Perform animal droppings related work as indicated in the RFP, in accordance with the ESR and the approved animal droppings removal work plan as described in UFGS 01 57 19.00 20.

F2020 1.10 MOLDS AND SPORES

Perform mold and spore related work as indicated in the RFP, in accordance with the ESR and the approved mold and spore work plan. The Designer of Record shall prepare UFGS Specification 02 85 00.00 20 MOLD REMEDIATION as part of the project specification and shall include the prepared specification section in the design submittal for the project. UFGS sections shall be edited in accordance with the limitations stated in PTS section Z10, General Performance Technical Specifications.

F2020 1.11 DISPOSAL

All waste materials shall become the property of the Contractor and shall be transported, disposed of and recycled in accordance with the approved disposal plan as described in UFGS 01 57 19.00 20.

F202001 *SUBSTRUCTURE & SUPERSTRUCTURE*

F202002 *EXTERIOR CLOSURE*

F202003 *ROOFING*

F202004 *INTERIOR CONSTRUCTION & FINISHES*

F202005 *CONVEYING SYSTEMS*

F202006 *MECHANICAL SYSTEMS*

F202007 *ELECTRICAL SYSTEMS*

F202008 *EQUIPMENT & FURNISHINGS*

F202009 *OTHER HAZARDOUS SELECTIVE BUILDING DEMOLITION*

Perform all other building components abatement work in accordance with the ESR.

-- End of Section --

SECTION G10

SITE PREPARATION
09/15

G10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

G10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

G10 1.1.1 Industry Standards and Codes

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

Refer to UMRL for reference designation identification.

G10 1.1.2 Government Standards

CORPS OF ENGINEERS (COE)

COE EM 385-1-1	Safety and Health Requirements Manual

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-201-01, Civil EngineeringUFC 3-220-01, Geotechnical Engineering)

UFC 1-200-02	High Performance and Sustainable Buildings
UFC 3-800-10N	Environmental Engineering for Facility Construction

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 31 23 00.00 20	Excavation and Fill

G10 1.2 PERFORMANCE VERIFICATION AND ACCEPTABLE TESTING

Compliance with the requirements will be determined by a review of the design and construction submittals and by field inspection. See Section 01 33 10.05 20, *Design Submittal Procedures*, and Section 01 33 00.05 20, *Construction Submittal Procedures*, for additional requirements. Verify satisfactory earthwork performance via testing detailed in the paragraph, "Field Quality Control", in UFGS Specification Section 31 23 00.00 20, *Excavation and Fill*.

G10 1.3 DESIGN SUBMITTALS

Design Submittals must be in accordance with UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-201-01, *Civil Engineering*, and UFC 3-220-01, *Geotechnical Engineering*.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR is required to edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS section Z10, *General Performance Technical Specifications*.

UFGS 31 23 00.00 20, *Excavation and Fill*

Provide sustainability submittals in accordance with UFGS 01 33 29.05 20 *Sustainability Reporting for Design-Build*.

G10 1.4 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) is required to approve the following construction submittals as a minimum:

Submittals in UFGS 01 57 19.00 20, Temporary Environmental Controls.

Submittals in UFGS Specification Section 31 23 00.00 20, Excavation and Fill.

Waste Management Plan in accordance with Section 01 74 19.05 20, Construction

and Demolition Waste Management for Design-Build.

Provide sustainability submittals in accordance with UFGS 01 33 29.05 20 *Sustainability Reporting for Design-Build*.

G10 1.5 GEOTECHNICAL REPORT

G10 1.5.1 Subsurface Soils Information

Any provided subsurface soil information is included for the Contractor's information only, and is not guaranteed to fully represent all subsurface conditions. The data included in this RFP are intended for proposal preparation and preliminary design only. Perform, at the Contractor's expense, such subsurface exploration, investigation, testing, and analysis as the Designer of Record deems necessary for the design and construction of the site improvements.

G10 1.5.2 Contractor-provided Geotechnical Engineer

The Contractor-provided Geotechnical Engineer is required to be experienced with soil conditions in the region where the project site is located. The Geotechnical Engineer is required to evaluate the RFP data, obtain and evaluate all additional data as required to support the design and construction, and prepare a Geotechnical Report.

Coordinate all work, if required, by the Contractor-provided Geotechnical Engineer at the project location with the Contracting Officer so as not to interfere with normal base operations. A minimum of two weeks prior to the Foundation Work Design submittal, provide the Contractor's Geotechnical Report (a searchable Adobe Acrobat PDF version on CD and two printed copies) for review and record keeping purposes. The report will become the property of the Government. Provide the geotechnical reports generated during construction, such as pile driving results and analysis, to the Contracting Officer. In addition, provide a searchable Adobe Acrobat PDF version and two printed copies for record keeping purposes.

G10 1.5.3 Contractor-Provided Geotechnical Report

Submit a written Geotechnical report based upon Government-provided subsurface investigation data and all additional field and laboratory testing accomplished at the discretion of the Contractor's Geotechnical Engineer. The Geotechnical Report must include all requirements listed in UFC 3-220-01, *Geotechnical Engineering*, paragraph entitled "Section 1803 Geotechnical Investigations"; in addition, include the following:

a. The project site description, vicinity map and site map indicating the location of borings and any other sampling locations. Provide 24 hour groundwater observations for at least 20% of the borings, minimum one boring. Provide notes explaining any abbreviations or symbols used and describing any special site preparation requirements.

b. Results of all applicable field and laboratory testing, whether

Government or Contractor-provided. Address existing subsurface conditions, selection and design of the foundation and floor slab, all underground construction including utility installation and all other site specific requirements (such as soil stabilization and slope stability).

c. Engineering analysis, discussion and recommendations Addressing:

1) Settlement analysis - Limit settlement as required in UFC 3-220-01 *Geotechnical Engineering*and EM 1110-1-1904 "Settlement Analysis".

2) Bearing Capacity analysis

3) Foundation selection (shallow, deep, special) and construction considerations; dimensions, and installation procedures.

4) Site preparation (earthwork procedures and equipment, compaction requirements, building slab preparation (as applicable), soil sensitivity to weather and equipment, groundwater influence on construction, mitigation of expansive soils or liquefaction potential, and dewatering requirements).

5) Sheeting and shoring considerations, as applicable.

6) Pavement design calculations with parameters defined, actual or assumed, and recommended thicknesses and materials.

7) Infiltration rate.

8) Haul routes and stockpile locations for earthwork, as applicable.

9) Calculations to support conclusions and recommendations.

10) Present recommendations on a structure-by-structure basis.

A registered Geotechnical Engineer is required to sign the Geotechnical Report.

Accompany the submitted report with a cover letter identifying any report recommendations proposed to be adopted into the design which are interpreted by the Contractor as a changed condition to the Geotechnical or Pavement related requirements of the RFP.

G10 1.5.4 Geotechnical Site Data required in Design Drawings

The Contractor's final design drawings must include the Government-provided subsurface data presented in the RFP, as well as any additional borings and laboratory test result data performed by the Contractor. The data provided is required to include:

a. Logs of Borings and related summary of laboratory test results and groundwater observations. Provide 24 hour groundwater observations for at least 20% of the borings, minimum one boring. Provide notes explaining any abbreviations or symbols used and describing any special site preparation requirements.

b. Indicate the locations of all borings on the drawings. Revise the applicable design drawings to reference the Contractor's Geotechnical Report as being a basis for design.

G1010 SITE CLEARING

G1010 1.1 GENERAL

Clear and grub project site as required for project construction.

G1010 1.2 BURNING

Where burning is permitted, adhere to the applicable federal, state, and local regulations.

G101001 CLEARING

G101001 1.1 CLEARING

Clear all trees, shrubs, brush and vegetation necessary for construction of the project. Clearing includes the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared.

G101001 1.2 PRESERVATION

Preserve and protect trees, shrubs and vegetation not directly impacted by the construction in accordance with Section 01 57 19.00 20, *Temporary Environmental Controls,* and PTS Section G205005, paragraph 1.1 *Existing Plant Material to Remain or be Transplanted*.

G101002 TREE REMOVAL

Remove and dispose of trees to a depth of at least 18 inches (450 mm) below ground surface. Fill depressions with satisfactory material and compact. Mound fill 2 inches (50 mm) above adjacent surface to allow for settling when not part of a subbase.

G101003 STUMP REMOVAL

Remove stumps to a depth of at least 18 inches (450 mm) below ground surface and grind stumps 18 to 30 inches (450 to 750 mm) below ground surface. Fill depressions with satisfactory material and compact. Mound fill 2 inches (50 mm) above adjacent surface to allow for settling when not part of a subbase.

G101004 GRUBBING

Within the clearing limits, remove and dispose of all logs, shrubs, brush, matted roots, roots larger than 2 inches (50 mm) in diameter, and other debris to a depth of at least 18 inches (450 mm) below ground surface. Fill depressions made by grubbing with satisfactory material and compact to make the new surface conform to the adjacent surface of the ground.

G101005 SELECTIVE THINNING

G101005 1.1 TREE THINNING

Trim trees to remain of dead branches 1-1/2 inches (38 mm) or more in diameter. Neatly cut limbs and branches in accordance with ANSI A300.

G101006 DEBRIS DISPOSAL

Prevent spillage on pavements, streets, or adjacent areas. Dispose of all surplus and unsuitable material off of Government property.

G1020 SITE DEMOLITION & RELOCATIONS

G1020 1.1 GENERAL

Demolition work includes the demolition, removal and legal disposal of existing construction debris as required to accommodate the new construction. Take necessary precautions to prevent damages to existing utilities, construction and materials not scheduled for demolition, repair or replacement; repair damages to the construction and materials to the satisfaction of the Contracting Officer and at no additional cost to the Government.

G1020 1.2 AUTHORIZATION

Do not begin demolition until the Demolition Plan has been approved by and authorization is received from the Contracting Officer.

G1020 1.3 TITLE TO MATERIALS

Whenever possible, salvage or recycle all features demolished in lieu of being disposed of as waste in a landfill. Since existing features to be demolished which are not salvageable or reused will become the property of the Contractor, remove them from the project site. The Government will not be responsible for the condition, loss of, or damage to, such property after contract award. Materials and equipment cannot be viewed by prospective purchasers or sold on the site.

G1020 1.4 REUSE OF MATERIALS AND EQUIPMENT

Remove and store materials and equipment to be reused or relocated to prevent damage, and reinstall as the work progresses.

G1020 1.5 SALVAGED MATERIALS AND EQUIPMENT

Salvage materials and equipment that are to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site on the station in accordance with instructions of the Contracting Officer.

G102001 BUILDING MASS DEMOLITION

Refer to Section F20 for additional information.

G102002 ABOVEGROUND SITE DEMOLITION

G102002 1.1 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris to occupied portions of a building or on pavements and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water for dust control if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to aircraft.

G102002 1.2 PROTECTION

G102002 1.2.1 Traffic Control

Where pedestrian and driver safety is endangered in the area of removal work, provide traffic control per FHWA Manual on Uniform Traffic Control Devices (MUTCD).

G102002 1.2.2 Foreign Object Damage (FOD)

Remove potential FOD debris and waste materials on or adjacent to operational airfield pavements due to the Contractor's operations. If necessary, install a temporary barricade at the Contractor's expense. The barricade is required to include a fence covered with a fabric designed to stop the spread of debris. Anchor the fence and fabric to prevent displacement by winds or jet/prop blasts. Remove barricade when no longer required.

G102002 1.2.3 Existing Work

Protect existing work that is to remain in place, be reused, or remain the property of the Government. At no additional expense to the Government, repair all items that are damaged during performance of the work to their original condition, or replace with new. Do not overload pavements to remain.

G102002 1.3 PAVING AND SLABS

Remove concrete and asphaltic concrete paving and slabs as required for construction of project. Remove the existing aggregate base in areas to receive new pavement to the depth of the proposed pavement section below new finish grade. Remove the existing aggregate base in areas not to receive new pavement to a depth of 8 inches (200 mm) below existing adjacent grade and break remaining pavement (if any) to allow drainage. Provide neat sawcuts at limits of pavement removal; protect sawcuts so that new pavement will butt against the existing without feathering.

G102002 1.4 ABOVEGROUND STORAGE TANKS

Perform aboveground storage tank removal work as indicated in the RFP, in accordance with the ESR and the approved aboveground storage tank removal work plan as described in Section 01 57 19.00 20, *Temporary Environmental Controls*.

G102003 UNDERGROUND SITE DEMOLITION

G102003 1.1 UTILITY TERMINATION

Terminate utilities in accordance with state and local rules and regulations; the nationally recognized code; and the requirements of the utility provider covering the specific utility; UFC 3-201-01, *Civil Engineering*; and approved by the Contracting Officer.

G102003 1.2 PROTECTION OF EXISTING UTILITIES

Protect existing utilities to remain. Where removal of existing utilities and pavement is required, provide approved barricades, temporary covering of exposed areas, and temporary services or connections. Repair damage to existing utilities to remain at no additional expense to the government.

G102003 1.3 UNDERGROUND STORAGE TANKS

Perform underground storage tank removal work as indicated in the RFP, in accordance with the ESR and the approved underground storage tank removal work plan as described in Section 01 57 19.00 20, *Temporary Environmental Controls*.

G102004 BUILDING RELOCATION

Refer to applicable portions of Section F20 for additional information.

G102005 UTILITY RELOCATION

Repair relocated items that are damaged or replace damaged items with new undamaged items as approved by the Contracting Officer and at no additional expense to the government.

G102006 FENCING RELOCATION

Remove and replace post foundations. Repair relocated items that are damaged or replace damaged items with new undamaged items as approved by the Contracting Officer and at no additional expense to the government. Refer to Section G204001 for requirements for new fence systems, as applicable.

G102007 SITE CLEANUP

Remove rubbish and debris from the station daily; do not allow accumulations inside or outside the building(s) or on pavements. Store materials that cannot be removed daily in areas specified by the Contracting Officer.

G1030 SITE EARTHWORK

G1030 1.1 GENERAL

This section includes the design and construction requirements for earthwork and grading related to construction of the roadways, parking, paved areas and other related sitework. Refer to Section A10 for earthwork related to construction of structures, including building, footings, foundations, retaining walls, slabs, tanks, and utility appurtenances.

The Designer of Record is required to utilize UFGS Specification Section 31 23 00.00 20, *Excavation and Fill*, for the project specification, and to submit the edited specification section as a part of the design submittal

for the project.

G103001 GRADING

Provide site grading in accordance with the requirements of UFC 3-201-01, *Civil Engineering*.

G103001 1.1 ELEVATIONS

Establish finish floor elevations as required by UFC 1-200-01, *General Building Requirements*, and UFC 3-101-01, *Architecture*.

G103001 1.2 SITE GRADING

Grade the site such that associated storm water runoff does not adversely affect surrounding sites. Preserve natural topographic features to minimize the impact on the existing drainage patterns at and adjacent to the site.

G103001 1.3 FINISHED SURFACES

Provide finish grading with drainage towards new and existing drainage features and with no resulting low spots that hold water or that direct runoff towards new or existing facilities or site amenities.

G103001 1.4 RODENT AND VEGETATION CONTROL

Prevent and eliminate standing water.

G103002 COMMON EXCAVATION

Preserve natural topographic features to minimize cut and fill requirements. Since all unsuitable material and surplus excavation will become the property of the Contractor, dispose of it as indicated in the Project Program.

G103003 ROCK EXCAVATION

If blasting is allowed, conduct it in accordance with EM 385-1-1 and Federal, state, and local safety regulations. Provide blasting mats and use non-electric blasting caps. Notify the Contracting Officer 24 hours prior to blasting.

Do not make requests for additional compensation for degree of hardness or difficulty encountered in removal of material. Since all unsuitable material and surplus excavation will become the property of the Contractor, dispose of it as indicated in the Project Program.

G103004 FILL & BORROW

G103004 1.1 SOURCES

Where sufficient topsoil and satisfactory materials are not available on the project site, provide suitable borrow materials. Test off-site soil in accordance with UFGS 31 23 00.00 20, *Excavation and Fill*, section titled "Requirements for Off Site Soil".

G103004 1.2 UNSATISFACTORY SOIL MATERIALS

Remove unsatisfactory soil materials from the site in accordance with the Project Program and replace with satisfactory soil materials in accordance with UFGS Specification Section 31 23 00.00 20, *Excavation and Fill*.

G103004 1.3 TOPSOIL

Refer to Section G2050, "Landscaping". Remove unsatisfactory, existing topsoil from the site in accordance with the Project Program.

G103005 COMPACTION

Provide compaction in accordance with UFGS Specification Section 31 23 00.00 20, *Excavation and Fill*, and the recommendations of the Contractor's Geotechnical Engineer, whichever is greater.

G103006 SOIL STABILIZATION

Provide soil stabilization designed to function as required by site conditions in accordance with the State Highway specifications and standards in the state where the project is located. Apply and install geosynthetics in accordance with the manufacturer's written instructions.

G103007 SLOPE STABILIZATION

Provide slope stabilization methods in accordance with the State Highway specifications and standards in the state where the project is located. Design and install manufactured products, gabions, geogrids, rock anchors in accordance with the manufacturer's written instructions.

G103008 SOIL TREATMENT

G103008 1.1 TERMITE CONTROL

Refer to Section A1010 1.2, "Termite Control".

G103009 SHORING

Provide sheeting, shoring, bracing, cribbing and underpinning in accordance with the Army Corps of Engineer's Safety and Health Requirements Manual (COE EM 385-1-1), UFC 3-220-01, *Geotechnical Engineering*, UFC 3-301-01, *Structural Engineering*, and all other applicable Federal, State and local codes and requirements

Provide protection of existing structures.

G103010 TEMPORARY DEWATERING

The design of the temporary dewatering system is required to account for soil conditions, rainfall, fluctuations in the groundwater elevations and the potential settlement impact on adjacent facilities due to dewatering. Provide dewatering in accordance with UFGS Specification Section 31 23 00.00 20. While the excavation is open, maintain the water level continuously, at least 1.0 foot (0.30 m) below the working level.

French drains, sumps, ditches or trenches will not be permitted within 3 feet (0.9

m) of the foundation of any structure without written approval of the Government's Civil/Geotechnical Reviewer.

G103011 TEMPORARY EROSION & SEDIMENT CONTROL

G103011 1.1 TEMPORARY EROSION & SEDIMENT CONTROL

Develop and implement temporary erosion and sediment control measures and other Best Management Practices (BMPs) prior to or in conjunction with commencement of earthwork in accordance with the state Erosion and Sediment Control Laws and Regulations. Remove all non-permanent erosion control measures after vegetation is fully established.

G103011 1.2 MAINTENANCE

Maintain temporary erosion control measures in accordance with state Erosion and Sediment Control Laws and Regulations throughout the project until areas are fully stabilized.

G103090 OTHER SITE EARTHWORK

G103090 1.1 HISTORIC AND ARCHAEOLOGIC ARTIFACTS

Refer to Section 01 57 19.00 20, *Temporary Facilities and Controls for Design-Build*, in Part 2 of this RFP.

G103090 1.2 PIPELINE CASING UNDER RAILROADS OR PAVEMENTS

Where required by code or local practice provide casing for piping under railroads or pavements. The Contractor is responsible for obtaining permits from all government and nongovernment owners/agencies in designing and providing the work.

G103090 1.3 TOPSOIL AND SEED

Provide topsoil and seed according to UFGS Specification Section 31 23 00.00 20, *Excavation and Fill*, except when landscaping is required.

G1040 HAZARDOUS WASTE REMEDIATION

G1040 1.1 EXCAVATION

Perform excavation of contaminated soil and groundwater as indicated in the RFP, in accordance with the ESR and the approved contaminated soil and groundwater removal work plan as described in Section 01 57 19.00 20, *Temporary Environmental Controls*. Excavate areas of contamination to the depth noted elsewhere in the RFP. Select methods and equipment to minimize disturbance to areas beyond the limits of the excavation area. Remove and dispose of material that becomes contaminated as a result of the Contractor's operations at no additional cost to the Government. Where excavation extends into groundwater levels, employ dewatering methods on a localized basis to facilitate excavation operations. Collect water generated by dewatering during excavation and test in accordance with the ESR and the approved work plan.

Dispose of water that contains contaminants above the levels indicated in

the ESR in accordance with the ESR and the approved work plan.

Non-contaminated water may be disposed of on-site.

G1040 1.2 STOCKPILED SOILS

Stockpile soils determined to be contaminated in accordance with the criteria in the ESR in accordance with the contaminated soil and groundwater removal work plan as described in Section 01 57 19.00 20, *Temporary Environmental Controls*, and dispose of them in accordance with the requirements of the ESR.

Soils that are determined to contain contaminants below the criteria listed in the ESR may be used as clean fill.

G1040 1.3 CLEAN FILL

Backfill and compact soils that are determined as clean fill via testing in accordance with the requirements listed in the ESR.

G1040 1.4 SPILLS

In the event of a spill or release of hazardous substances, pollutant, contaminant or oil, notify the Contracting Officer immediately. Containment actions must be taken immediately to minimize the effect of any spill or leak. Perform clean up at the Contractor's expense in accordance with the ESR and the approved spill work plan as described in Section 01 57 19.00 20, *Temporary Environmental Controls*.

G1040 1.5 DISPOSAL

Since all waste materials will become the property of the Contractor, transport and dispose of it in accordance with the criteria listed in the ESR and the approved disposal plan as described in Section 01 57 19.00 20, *Temporary Environmental Controls*.

-- End of Section --

SECTION G20

SITE IMPROVEMENTS
09/15

G20 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

G20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

G20 1.1.1 Industry Standards and Codes

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

AMERICAN SOD PRODUCERS ASSOCIATION (ASPA)

U.S CONSUMER PRODUCT SAFETY COMMISSION, PUBLICATION NO. 325

Refer to UMRL for reference designation identification.

G20 1.1.2 Government Standards

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS RR-F-191	Fencing and Wire and Post Metal (and Gates, Chain-link Fence Fabric, and Accessories)

FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed

	in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-201-01, Civil Engineering; UFC 3-201-02, Landscape Architecture; UFC 3-220-01, Geotechnical Engineering
UFC 1-200-02	High Performance and Sustainable Buildings
UFC 3-250-01FA	Pavement Design for Roads, Streets, Walks, and Open Storage Areas
UFC 3-270-01	Asphalt Maintenance and Repair
UFC 3-270-02	Asphalt Crack Repair
UFC 3-270-03	Concrete Crack and Partial Depth Spall Repair
UFC 3-270-04	Concrete Repair
UFC 3-800-10N	Environmental Engineering for Facility Construction
UFC 4-022-02	Selection and Application of Vehicle Barriers

G20 1.2 QUALITY ASSURANCE

G20 1.2.1 Qualifications of Tree Location Contractor

Contractor is required to be a professional tree moving company holding landscape contractor's license in the state where the work is to be performed and have a minimum ten years of tree relocation experience. Contractor must be a Certified Arborist certified by the International Society of Arboriculture. Arborist shall oversee all tree moving operations during construction.

G20 1.2.2 Qualifications of New Landscape Contractor

Construction company must hold a landscape contractor's license in the state where the work is to be performed and have a minimum five years of landscape construction experience.

G20 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Compliance with the requirements will be determined by a review of the design and construction submittals and by field inspection. See Section 01 33 10.05 20, *Design Submittal Procedures*, and Section 01 33 00.05 20, *Construction Submittal Procedures*, for additional requirements.

Verify satisfactory performance via Performance Verification, as detailed in this section of the RFP. Verify satisfactory performance also via

testing as detailed in the paragraph, Field Quality Control, in applicable UFGS Specification Sections utilized.

G20 1.3.1 Subgrade Preparation Performance Verification

Perform subgrade preparation in accordance with PTS Section G10. If required by the Designer of Record, perform proof rolling. Perform proof rolling in the presence of the Contracting Officer. Rutting or pumping of material is required to be undercut as directed by the Contracting Officer and replaced with satisfactory soil materials as defined in Section G10, *Site Preparation*.

G20 1.3.2 Base Course Performance Verification

G20 1.3.2.1 Aggregate Base Course

a. Sampling: ASTM D75/D75M.
b. Gradation: ASTM C136.
c. Thickness: Confirm in-place compacted thickness. Acceptable tolerances are plus or minus 0.5 inches (13 mm). One test for every 500 square yards (418 square meters); minimum 2 tests.
d. Density: ASTM D1556 or ASTM D6938. One field test for every 1000 square yards (836 square meters); minimum 2 tests. ASTM D1557, Method A, B or C; one laboratory test for the project.
e. Visual: Surface must be smooth with no ruts.

G20 1.3.2.2 Other Types of Base Courses

For other types of base courses, provide field testing in accordance with the SHS.

G20 1.3.3 Bituminous Concrete Pavement Performance Verification

- Visual: Finished surface must be uniform in texture and appearance and free of cracks and creases.
- Sampling: ASTM D979.
- Job Mix: Determine gradation and bitumen content. One sample for every 400 tons (362,500 kilograms); minimum 1 test.
- Thickness: ASTM D3549. Confirm in-place compacted thickness. Acceptable tolerances are plus or minus 0.5 inches (13 mm) for bituminous base course

and plus or minus 0.25 inches (6 mm) for bituminous surface course. One test for every 500 square yards (418 square meters); minimum 2 tests.

- Surface Smoothness: Test surface smoothness by using a 10 foot (3 meter) straightedge in transverse and longitudinal directions to pavement. Acceptable tolerances are plus or minus 0.25 inches (6 mm) for bituminous base and surface courses.
- Density: Conduct field density of in-place compacted pavement in accordance with ASTM D2950 and correlated with ASTM D1188 or ASTM D2726/D2726M. One field test for every 1000 square yards (836 square meters); minimum 2 tests. One laboratory test for the project.

G20 1.3.4 Portland Cement Concrete Pavement Performance Verification

- Visual: Finished surface must be uniform in texture and appearance and free of cracks.
- Sampling: ASTM C31/C31M.
- Thickness: Acceptable tolerances are plus or minus 0.5 inches (13 mm). One test for every 500 square feet (418 square meters); minimum 2 tests.
- Surface Smoothness: Test surface smoothness by using a 12 foot (3.6 meter) straightedge in transverse and longitudinal directions to pavement. The finished surfaces of the pavements must have no abrupt change of 0.71 inch (18 mm) or more.

- Strength: Samples for strength tests of each mix design of concrete placed each day are required to be taken not less than once a day, nor less than once for each 100 cubic yards (120 cubic meters) of concrete, nor less than once for each 5000 square feet (500 square meters).

  1) Compressive Strength: ASTM C39/C39M. Make five test cylinders for each set of tests. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve. Determine each strength test result by the average of two cylinders from the same concrete sample tested at 28 days. If the average of any three consecutive strength test results is less than f'c or if any strength test result falls below f'c by more than 500 psi, take a minimum of three ASTM C42/C42M core samples from the in-place work represented by the low test cylinder results and test. Consider the concrete represented by core test structurally adequate if the average of three cores is equal to at least 85 percent of f'c and if no single core is less than 75 percent of f'c. Retest locations represented by erratic core strengths.

  2) Flexural Strength: ASTM C78/C78M. Make four test specimens for each set of tests. Test two specimens at 28 days, and the other two at 90 days. Concrete strength

will be considered satisfactory when the minimum of the 90-day test results equals or exceeds the specified 90-day flexural strength, and no individual strength test is less than the design strength. If the ratio of the 28-day strength test to the specified 90-day strength is less than 65 percent, make necessary adjustments for conformance.

- Remove concrete not meeting strength criteria and provide new acceptable concrete at no expense to the government. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete.

G20 1.3.5 Concrete Joint Performance Verification

Install a test section of 500 linear feet (150 m) at start of sealing operation for each type sealant to be used. Obtain approval of test section by Contracting Officer prior to installing additional joint seal. Reject joint sealer that fails to cure properly, or fails to bond to joint walls, or reverts to uncured state or fails in cohesion, or shows excessive air voids, blisters, or has surface defects, swells, or other deficiencies, or is not recessed within indicated tolerances. Remove rejected sealer and reclean and reseal joints.

G20 1.3.6 Topsoil Performance Verification

Prior to planting design, provide a commercial soil analysis. Amend planting areas based on the soil test's interpretation, amendment type, and quantity recommendations (including soil nutrients and texture, with percentages shown). Use additional topsoil only in areas where soil analysis shows that the existing soil is inadequate for growth of plant materials.

G20 1.3.7 Final Inspection for Planting and Irrigation

Request the final inspection in writing at least 10 days prior to the last day of the planting and irrigation Establishment Period. The Landscape Contractor must attend the inspection with the Contracting Officer and document the inspection. The Landscape Architect-of-Record must also attend the inspection and provide the Contracting Officer with a letter certifying that the planting and irrigation is installed per the plans and irrigation coverage is correct and appropriate for optimum plant survival. At the end of the Establishment Period, remove all stakes and guy cables.

G20 1.3.8 Landscape and Irrigation Establishment Period and Guarantee

Guarantee all transplanted trees, newly planted vegetation and irrigation systems for a period of one year after the Contracting Officer's final acceptance. This acceptance, and the submittal of irrigation as-builts and controller charts, begins the Establishment Period. Replace all trees, shrubs, and ground covers that die or have 20 percent or more of their crowns that die during planting operations or the guarantee period with healthy plants of the same species or variety during the appropriate planting season. The Landscape Architect-of-Record must, along with the Contracting Officer, attend, approve and document the start of the Establishment Period and document quarterly and final inspections. The Landscape Architect of Record must document quarterly and final inspections by submitting written reports with photographs to the Contracting Officer. During this period, perform tasks including, but not limited to: watering, mowing, overseeding, fertilizing, mulching, pruning, weeding, eradicating pests (rodents, rabbits, insects, mammals and fungus), restaking, adjusting guy wires, adjusting irrigation systems, maintaining erosion control materials, removing dead or broken branches by pruning in accordance with ANSI A300 Part 1, maintaining edging of planter beds, checking for girdling of trees, removal of trash and debris, and replenishing mulch to assure all plant material is in a healthy and thriving condition or replace plant material at Contractor's expense. Reseed broadcast seeded or hydro-seeded areas that do not achieve the 95-percent coverage by the end of the Establishment Period by the same method and maintain an additional 120 days to ensure coverage requirements are met. Maintain turf in a manner that promotes proper health, growth, rich natural green color, and a neat, uniform, manicured appearance, free of bare areas, ruts, holes, weeds, pests, dead vegetation, debris, and unwanted vegetation that present an unsightly appearance. Mow weekly during the growing season and remove excess clippings.

G20 1.4 DESIGN SUBMITTALS

Design Submittals must be in accordance with UFC 1-200-01, General Building Requirements, UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, and UFC 3-201-01, *Civil Engineer*ing.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR is required to edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS section Z10, *General Performance Technical Specifications*.

32 11 16.13, *Sand-Clay [Base] [Subbase] Course*

32 11 16.16, *[Base Course for Rigid] [and Subbase Course for Flexible] Paving*

32 11 24, *Graded Crushed Aggregate Base Course for Flexible Pavement*

32 11 26.16, *Bituminous Concrete Base Course*

32 11 33, *Cement Stabilized [Base] [Subbase] Course at Airfields and Roads*

32 11 36.13, *Lean Concrete Base Course*

32 12 17, *Hot Mix Bituminous Pavement*

32 13 13.06, *Portland Cement Concrete Pavement for Roads and Site Facilities*

32 13 43, *Pervious Concrete Paving*

32 16 15, *Concrete Block Pavements*

Provide sustainability submittals in accordance with UFGS 01 33 29.05 20 *Sustainability Reporting for Design-Build*.

G20 1.5 CONSTRUCTION SUBMITTALS

Submit a transplanting plan for all projects which include transplanting trees. Submit the plan showing existing and proposed locations of transplanted trees. Include in the plan delineate methods and times for root pruning, digging, balling, removing, storing, transporting, planting, watering, and maintenance to ensure survivability. Include also in the plan equipment, anti-desiccant, and pesticides to be used. Provide a listing of the plant material to be transplanted by common name and botanical name as listed under "Nomenclature" in ANSI Z60.1; classification; caliper; and height.

Provide sustainability submittals in accordance with UFGS 01 33 29.05 20 *Sustainability Reporting for Design Build*.

G20 1.5.1 Transplanting Plan

Submit a transplanting plan for all projects which include transplanting trees. Submit the plan showing existing and proposed locations of transplanted trees. Include in the plan delineate methods and times for root pruning, digging, balling, removing, storing, transporting, planting, watering, and maintenance to ensure survivability. Include also in the plan equipment, anti-desiccant, and pesticides to be used. Provide a listing of the plant material to be transplanted by common name and botanical name as listed under "Nomenclature" in ANSI Z60.1; classification; caliper; and height.

G20 1.5.2 As-Builts

Submit a complete set of irrigation as-builts to the Contracting Officer, to include the recording of measurements onto a record set of full-size project irrigation plans. Indicate measurements for locating water meters, pressure supply lines at 100 foot (30 m) intervals, backflow prevention devices, rain/freeze sensors, valves (including quick couplers and hose bibbs), controllers (and control wire, if routed separately from pressure supply line); all dimensioned from two permanent points of reference, such as building corners, sidewalks, and other permanent features.

G20 1.6 ANTITERRORISM (AT) STANDARDS

Incorporate the minimum AT standards indicated in UFC 4-010-01, *DoD Minimum Antiterrorism Standard for Buildings*.

G20 1.7 PROJECT LIMITATIONS

Prior to the start of design, determine the exact limit-of-work line for the project periphery, considering items such as, but not limited to, utility work, landscape areas, and laydown areas. See PTS G2050 for limits of landscape areas.

G2010 ROADWAYS

G2010 1.1 PAVEMENT DESIGN

Provide geometric and pavement design, including minimum pavement sections, in accordance with UFC 3-201-01, *Civil Engineering*, and the State Department of Transportation. Provide pavement calculations in accordance with FC 1-300-09N, *Navy and Marine Corps Design Procedures*. Provide any required additional pavement design to provide a complete and useable facility.

For pavements subject to aircraft traffic or aircraft ground support equipment traffic consult Government Civil Reviewer for design criteria and requirements. State Department of Transportation standards are not acceptable for airfield pavements.

G2010 1.2 PAVEMENT AESTHETICS

Provide surfaces consistent in color and finish.

G2010 1.3 TRAFFIC CONTROL DEVICES

Provide and install new traffic control devices (i.e., signs and markings) in accordance with the United States Department of Transportation Federal Highway Administration's *Manual on Uniform Traffic Control Devices* and their standard, "Rigid Sign Supports". Also provide new traffic control devices along/in the existing streets adjacent to the project site as necessary to provide complete traffic control to the new facilities.

G2010 1.4 EXISTING UTILITY STRUCTURES

Adjust existing utility structures to meet the new finished pavement grades as required.

G201001 BASES & SUBBASES

Prepare subgrade in accordance with Section G10, *Site Preparation*. Geotextiles may be used for separation or reinforcement in accordance with manufacturer's instructions. Provide base course under paved areas in accordance with the State Highway specifications (SHS) in the state where the project is located.

Place base course in accordance with the SHS for that particular base course and in layers of equal thickness with no compacted layer more than 6 inches (150 mm) thick. Compact base course at optimum moisture content to 100 percent ASTM D 1557 maximum dry density.

Where SHS are not available or applicable, the Designer of Record must utilize

the applicable UFGS Specification Sections referenced under paragraph 1.1.2 entitled "Government Standards" for the project specification. Submit these specifications in edited form as a part of the design submittal for the project.

G201002 CURBS & GUTTERS

Provide concrete curbs and gutters in accordance with the SHS and standards or as specified in UFC 3-201-01, *Civil Engineering*, whichever is more stringent. Where the SHS do not include concrete materials for curbs and gutters, provide concrete in accordance with the applicable standard mix of the SHS for a minimum compressive strength at 28 days of 3500 psi (25 MPa) concrete.

G201003 PAVED SURFACES

Where SHS are not available or applicable, the Designer of Record must utilize the applicable UFGS Specification Sections referenced under paragraph 1.1.2 entitled "Government Standards" for the project specification. Submit these specifications in edited form as a part of the design submittal for the project.

G201003 1.1 PAVEMENT MIX

G201003 1.1.1 Bituminous Concrete Pavement

Provide bituminous concrete pavement in accordance with the applicable standard mix of the SHS based on the pavement design and vehicle loading indicated in this RFP.

G201003 1.1.1.1 Bituminous Concrete Placement

Provide bituminous concrete placement, including minimum temperature during placement, joints, and maximum lift thickness in accordance with the SHS. Compact bituminous concrete in accordance with the SHS, modified to 96 percent of maximum laboratory density.

G201003 1.1.2 Portland Cement Concrete Pavement

If reinforced, provide the welded wire fabric in conformance to ASTM A185. Provide bar reinforcement in conformance to ASTM A615/A615M, Grade 400 (Grade 60).

Provide concrete in accordance with the applicable standard mix of the SHS for the design strength required by UFC 3-201-01, *Civil Engineering*, plus any allowable deviations. Unless noted otherwise in Part 3 or Part 6, provide a minimum compressive strength at 28 days of 3500 psi (25 MPa) concrete.

If required for applicable sustainability goal, provide Portland cement concrete pavement with a Solar Reflectance Index (SRI) greater than or equal to 29.

G201003 1.2 JOINTS FOR PORTLAND CEMENT CONCRETE PAVEMENT

Provide joints in accordance with SHS and the applicable portions of UFC 3-250-01FA, *Pavement Design for Roads, Streets, Walks, and Open Storage Areas*. Install joints in a manner and at such time to prevent random or

uncontrolled cracking. Joints must form a regular rectangular pattern. Wherever curved pavement edges occur, make joints to intersect tangents to curve at right angles.

G201003 1.2.1 Expansion Joints

Provide thickened edge expansion joints at the intersection of two rigid pavements. Use preformed joint filler, ASTM D1751. Filler must be compatible with joint sealer material. Securely hold preformed joint filler in position during concreting operations.

G201003 1.2.2 Isolation Joints

Provide thickened edge isolation joints by placing a 1/2-inch (12 mm) preformed joint filler (ASTM D 1751) around each structure that extends into or through the pavement before concrete is placed at that location.

G201003 1.2.3 Contraction Joints

Saw joint lines within specified tolerance, straight, and extend for width of transverse joint, and for entire length of longitudinal joint.

G201003 1.2.4 Construction Joints

If an emergency stop occurs remove the concrete back to location of transverse joint and install a construction joint.

G201003 1.2.5 Joint Sealants

ASTM D5893/D5893M; provide single component cold-applied silicone. Silicone sealant must be self-leveling and non-acid curing.

G201003 1.2.6 Preformed Compression Seals

Use preformed compression seals in areas where silicone joint sealant does not perform, such as areas subject to water inundation, blasts, or constant/repeated fuel spillage.

ASTM D 2628. ASTM D 2835, for lubricant.

G201003 1.3 PRIME COAT

Use prime coat in accordance with the SHS. Prime coat must be emulsified asphalt materials.

G201003 1.4 TACK COAT

Tack coat is required for bituminous pavement overlays and on vertical cut faces of pavement patches. Provide tack coat in accordance with the SHS.

G201003 1.5 PAVEMENT PATCHES

Provide pavement patches for existing pavements where required for installation of utility trenches. Sawcut 12 inches beyond edge of trench.

Provide thicknesses of pavement materials equal to or greater than the existing pavement section.

For spalls or repairs of existing concrete pavement, perform repairs in conformance with UFC 3-270-03, *Concrete Crack and Partial Depth Spall Repair*, and UFC 3-270-04, *Concrete Repair*. Spall repair materials must be either Rapid Setting Cementitious Concrete (RSCC), epoxy concrete, or polymer-modified Portland Cement (non-sag mortar) products specially formulated for spall repairs, with a proven record (in service at least three years) of satisfactory use under loading and environmental conditions similar to those at the location of intended use. Provide a manufacturer's data sheet and certificate supporting the satisfactory use to the Contracting Officer with the design. A product manufacturer's representative is required to be present during the initial two days of product application to verify that manufacturer's instructions for use are adhered to by the contractor. Give the Contracting Officer 7 days notice prior to the initial application in order to be present.

G201004 MARKING & SIGNAGE

G201004 1.1 MARKING

Provide pavement markings in accordance with the SHS. Design materials for life expectancy of at least 3 years under an average daily traffic count per lane of approximately 9000 vehicles. Water based paints must have durability rating of at least 4 when determined in the wheel path area.

Provide a half-rate initial marking application on bituminous pavements. Provide the remaining application at the end of the normal curing period.

G201004 1.2 SIGNAGE

Provide signage in accordance with the MUTCD.

G201005 GUARDRAILS & BARRIERS

G201005 1.1 GUARDRAILS

Provide guard (guide) rails in accordance with the SHS. Where the SHS do not include materials for guardrails, provide guardrails in accordance with the applicable portions of the *AASHTO Roadside Design Guide*.

G201005 1.2 BOLLARDS

For bollards to prevent damage, provide minimum 4 feet height, 4 inch diameter steel pipe filled with concrete, painted, and embedded in a portland cement concrete foundation.

For bollards located at building entries or other high-visibility areas provide decorative bollards matching the design of the facility or consistent with the Base Exterior Architecture Plan (BEAP) and the Installation Appearance Plan.

Bollards for security are specified in Section G204004, "Security Structures".

G201006 RESURFACING

Adjust rims of existing utility structures to match proposed grades after resurfacing.

G201006 1.1 SLURRY SEAL

ASTM D 3910 and in accordance with the SHS.

G201006 1.2 BITUMINOUS CONCRETE OVERLAY

Remove old pavement by cold milling to depths required to provide new surface and leave underlying materials intact. Clean the pavement of excessive dirt, clay or other foreign matter with power brooms and hand brooms immediately prior to the milling operation.

Repair or replace damaged utility structures, valve boxes, or pavement that is torn, cracked, gouged, rutted, broken or undercut at no addition expense to the government.

Provide bituminous concrete overlay produced from hot or cold recycling of the milled material or from virgin materials in accordance with the applicable provisions of UFC 3-201-01, *Civil Engineering*, and the standard mix of the SHS based on the pavement design and vehicle loading as indicated in this RFP.

G201006 1.3 CRACK SEALING

Use fiber reinforced crack sealer for sealing cracks in asphalt pavement after milling and prior to resurfacing. Provide crack sealing conforming to the following requirements in UFC 3-270-01, *Asphalt Maintenance and Repair*, and UFC 3-270-02, *Asphalt Crack Repair*.

G2020 PARKING LOTS

Refer to Section G2010.

G2020 1.1 PERMEABLE PAVEMENT

Provide permeable concrete pavers of solid interlocking paving units complying with ASTM C936, resistant to freezing and thawing when tested according to ASTM C67, and made from normal-weight aggregates. If required for applicable sustainability goal, provide permeable concrete pavers with a Solar Reflectance Index (SRI) greater than or equal to 29.

Provide pervious concrete in accordance with UFGS Specification Section 32 13 43, *Pervious Concrete Paving*.

Do not use asphalt-surfaced porous pavement.

G202001 BASES & SUBBASES

Refer to Section G201001.

G202002 CURBS & GUTTERS

Refer to Section G201002.

G202003 PAVED SURFACES

Refer to Section G201003.

G202004 MARKING & SIGNAGE

Refer to Section G201004. Provide water-based paints only.

Mark neatly to denote traffic lanes and parking spaces; mark in accordance with the requirements of UFC 3-201-01, *Civil Engineering*.

G202005 GUARDRAILS & BARRIERS

Refer to Section G201005.

G202005 1.1 WHEELSTOPS

Provide precast concrete wheelstops.

G202006 RESURFACING

Refer to Section G201006.

G2030 PEDESTRIAN PAVING

Locate new sidewalks such that they maintain continuity of pedestrian traffic to and from the existing sidewalks adjacent to the site(s).

G203001 BASES & SUBBASES

Provide as required by local standards or geotechnical report; refer to Section G201001.

G203003 PAVED SURFACES

G203003 1.1 SIDEWALKS

Provide sidewalks of Portland cement concrete pavement with 4 inches (100 mm) thick minimum or permeable pavement. Provide concrete and permeable pavement in accordance with Section G201003 and G2020, respectively. For PCC sidewalks, provide a broomed finish. Provide sidewalks of at least 5 feet (1.5 meters) wide, except that sidewalks connecting entry points of housing units to the housing unit's parking are required to be at least 36 inches (900 mm) wide. In housing areas, offset sidewalks paralleling streets to maintain a minimum grassed separation of 5 feet (1.5 meters) from the back face of the curb to the closest edge of the sidewalk.

Unless indicated otherwise, provide a transverse slope of 1/48. Limit variation in cross section to 0.25 inch in 5 feet (6 mm in 1.50 m).

Submit samples boards per ESR G2050 and PTS G2050 and finish schedule on final plans.

G203003 1.1.1 Joints for PCC Pavement Sidewalks

Provide contraction joints spaced at intervals equivalent to the width of the sidewalk. Provide 0.5 inch (13 mm) thick transverse expansion joints at changes in direction where sidewalk abuts curb, steps, rigid pavement, or other similar structures; space expansion joints every 50 feet (15 m) maximum. Provide isolation joints by placing a 1/2-inch (12 mm) preformed expansion joint filler around each structure that extends into or through the sidewalk before concrete is placed at that location.

G203003 1.2 CONCRETE PAVERS

Concrete pavers shall meet ASTM C936. Install in accordance with manufacturers recommendations.

G203003 1.3 HANDICAPPED RAMPS

Provide handicapped ramps of PCC pavement with an exposed aggregate finish, truncated domes, or as required by the SHS at roadway intersections.

G203004 GUARDRAILS & BARRIERS

Refer to Section G201005.

G2040 SITE DEVELOPMENT

G204001 FENCING & GATES

G204001 1.1 CHAIN LINK FENCE

Provide chain link fence designated as security fencing in accordance with paragraph G204001 - 1.3.

Chain link fence fabric must be at least 9 gauge (3 mm) steel wire mesh material (before any coating) with mesh openings not larger than 2 inches (51 mm). Do not use aluminum fabric, posts or accessories. Install fence in accordance with ASTM F567 and the manufacturer's written installation instructions.

G204001 1.1.1 Tensions Wires and Top Rails

Provide rails in accordance with FS RR-F-191/3, Class 1, steel pipe, Grade A.

G204001 1.1.2 Gates

Provide gates in accordance with FS RR-F-191/2 with posts and fabric as specified for fence.

G204001 1.1.3 Posts and Braces

Provide posts and braces in accordance with FS RR-F-191/3, Class 1, steel pipe, Grade A. Each gate, terminal and end post will be braced with truss rods.

G204001 1.1.4 Fencing Accessories

Provide fencing accessories in accordance with FS RR-F-191/4. If PVC coating is required, provide accessories with PVC color coating similar to that specified for chain-link fabric or framework.

G204001 1.2 ORNAMENTAL FENCE

G204001 1.3 SECURITY FENCE

Provide security fencing systems in accordance with UFC 4-022-03, *Security Fences and Gates*, and this RFP.

G204001 1.3.1 Chain Link Security Fence

Provide chain link fence in accordance with paragraph G204001 - 1.1, excepted as noted otherwise. Ensure that the fabric has twisted and barbed selvage at the top and bottom. Do not provide top rails. Locate all posts and structural supports on the inner side of the fencing. Install outriggers facing outward except when the fence must be mounted directly on the property line.

G204001 1.3.2 Signage

Provide signage at a minimum of 200 foot (61 m) intervals along the entire perimeter.

G204001 1.3.3 Drainage Culverts and Utility Openings

Provide protective measures to prevent access through culverts, storm drains, sewers, air intakes, exhaust tunnels and utility openings or across drainage ditches or swales as required in UFC 4-022-03.

G204001 1.4 OPENINGS IN PERIMETER AND SECURITY FENCING

Do not cover, block or lace openings in perimeter fencing and security fencing with material which would prevent a clear view of personnel, vehicles or material in the outer or inner vicinity of the fence line.

G204001 1.5 FENCE GROUNDING

Grounding and bonding of the fencing must be in accordance with the National Electric Safety Code (NESC) - IEEE C2 and UFC 4-022-03. Ground fencing on either side of every gate and at other locations when the fencing is near and parallel to high tension power lines. Grounding is also required at intervals of 1000 feet (305 meters) to 1500 feet (457 meters) when the fencing runs through isolated areas and at lesser distances depending on the proximity of the fencing to public roads, highways and buildings where the fencing is around or within any explosive storage, production, operating or handling areas.

G204001 1.6 ENCLOSURES FOR UTILITY EQUIPMENT

Where fencing is used to provide an enclosure for utility equipment, ensure a minimum clearance is provided no less than 3 feet (900 mm) around the equipment to permit maintenance access and ventilation. Provide stone, gravel or concrete paving within the enclosure.

G204002 RETAINING WALLS AND FREESTANDING WALLS

Provide retaining walls to permanently resist soil pressures as well as live loads. Provide wall drainage to minimize lateral loading and protect wall materials against degradation.

G204003 EXTERIOR FURNISHINGS

Refer to ESR G20 and other portions of the RFP for exterior furnishings required on this project. Permanently attach all site furnishings to concrete pads. Provide site furnishings in conformance with the Base Exterior Architecture Plan (BEAP) and or Installation Appearance Plan for each Activity. If no product guidance is given, coordinate material, finish and color with architecture (fiberglass and aluminum are not acceptable) and provide to the greatest extent possible, materials with industrial recycled content, preferably from regionally local manufacturers.

G204003 1.1 PICNIC AND PASSIVE RECREATION AREAS

Include tables, with attached benches, on concrete bases sloped to drain and permanent barbecue grill(s) for picnic areas. Additionally, provide separate receptacles for trash, recycling and barbecue ashes. Permanently attach all site furnishings to concrete paving extending a minimum of 12 inches (300 mm) past the furnishing, with the exception of picnic tables and benches, which require concrete paving extending 2 feet (600mm) minimum on all sides. The elevation of the finished concrete must be plus 1 inch (25 mm) above adjacent grade.

G204003 1.2 TRASH RECEPTACLES

Provide trash receptacles with drain hole and stationary or self-closing lids with anchor chains secured to the receptacle to protect the contents from weather. Design receptacles to hold heavy-duty plastic or galvanized steel liners of the same manufacturer. Consider potential weight of full containers when deciding on 'top loading' or 'side loading' receptacles. Include a concrete pad 12 inches (300 mm) larger on all sides than the size of the trash receptacle base.

G204003 1.3 BENCH

Minimum 6 feet (1.8 meter) length to match trash and recycling receptacle material & color, installed a minimum of 18 inches (450 mm) above finish grade, permanently installed with anchor bolts or in-ground. For benches located in nonpaved areas, provide concrete pads extending a minimum 2 feet (0.6 meters) beyond the edge of the seat portion of the bench (or both front and back if accessible from either).

G204003 1.4 RECYCLING RECEPTACLES

Provide recycling receptacles, single-piece with separate slots for cans, bottles, newspaper. Match height, material, and style of the trash receptacle.

G204003 1.5 BARBEQUE

Minimum 12 inches (300 mm) x 18 inches (450 mm) with heavy-duty grill and

hinged stainless steel lid, factory primed and painted with rust-resistant paint. Install so coal height is a minimum of 36 inches (0.91 meter) above finish grade.

G204003 1.6 HOT ASH RECEPTACLE

Minimum 28 square inches (181 square centimeters) x 42 inches (1.1 meter) high pre-cast reinforced concrete with drain hole with steel ash grate and cast in "Hot Coals Only" logos on each side with white letters on a red background.

G204004 SECURITY STRUCTURES

Where identified for project elsewhere in this RFP, provide active and passive vehicle barriers to effectively stop or detect penetration by explosive-laden vehicles through the perimeter of a protected area in accordance with UFC 4-022-02, *Selection and Application of Vehicle Barriers*.

G204005 SIGNAGE

Provide facility signage as required by local code, the Installation and Appearance Guide, the Base Exterior Architectural Plan (BEAP) and this RFP.

Size messages and graphics on signs according to the functional viewing distance. Typically, at least 1 inch (25 mm) of letter height per 25 feet (7.62 meters) of viewing distance is required for readability.

Refer to Section G201004, "Marking & Signage" for traffic signage.

G204007 PLAYING FIELDS

G204007 1.1 PLAYGROUNDS

Design playgrounds and provide surfacing and equipment in accordance with this RFP and U.S. Consumer Products Safety Commission Publication 325 and ASTM F1487. Border tot-lots and play-lots with reinforced concrete curbing to a depth appropriate to the type safety surfacing utilized. Provide shade and wind protection where these elements may significantly limit the use of the facilities. For tot-lots and play-lots provide separated areas with appropriately sized equipment and materials to serve their developmental levels. Separate areas by a buffer zone, which can be an area of shrubs, hardscape or benches. Provide signage to give guidance to adults as to the age appropriateness of the equipment.

G204007 1.1.1 Tot Lots

Design each "tot lot" to accommodate children from ages 2 through 5 to provide a variety of play activities and motor skill development opportunities which may include, as a minimum:

For multi-activity structures provide a minimum of two platforms and two slides, one wheel chair accessible, swing set for young children, paired spring mounted 'riders' or other similar types of apparatus. Locate at least two benches with backs on concrete bases for convenience to, and observation of, the tot-lot.

G204007 1.1.2 Play Lots

Design each "play lot" to accommodate children from ages 5 to 12 which provide a wider range of activities and opportunities for greater motor skills development and improvement. These may include, as a minimum:

For a multi-activity structure, provide a minimum of three platforms and two slides, one wheel chair accessible. A swing set, or other similar types of apparatus. Locate at least two benches with backs on concrete bases for convenience to, and observation of, the play-lot.

G204007 1.1.3 Equipment

Tot lot and play lot equipment must be factory finished institutional quality, in compliance with ASTM F1487, the United States Consumer Products Safety Commission's *Guidelines for Public Playgrounds*, and the UFC 3-201-01, *Civil Engineering*. Use only equipment that has been approved by International Play Equipment Manufacturers Association (IPEMA) and installed by a National Playground Contractors Association (NPCA) contractor.

Site tot lot and play lot equipment to provide use and no encroachment zones in accordance with ASTM F1487. A use zone is a clear, unobstructed area under and around play equipment where a child would be expected to land when jumping or falling from a piece of play equipment. Requirements for use zones vary for the age group and for different pieces of equipment. Show all use zones for play equipment on the site plan to ensure there is no conflict between play activities on the ground and swinging or jumping from the equipment. The No-encroachment zone is an additional area beyond the use zone where children using the equipment can be expected to move about and should have no encroaching obstacles. This area will vary according to the types of adjacent equipment, and their orientation to one another.

G204007 1.1.4 CCA-Treated Lumber

Do not use chromated copper arsenate (CCA) treated lumber in recreational facilities for children.

G204007 1.1.5 Playground Safety Surface

Provide a playground safety surface, in accordance with ASTM F355 and ASTM F1292, throughout all use zones and under all play equipment in tot lots and play lots. Natural wood products and decomposed granite are not allowed for surfacing. Loose fill surfacing must be a minimum of 4 inches (100 mm) below the top of edging. Consider local climate, soil conditions, location and size of area, type of activity, age of users, and intensity of use when choosing surfacing material. Provide soil separator fabric between playground loose-fill material and subgrade soil. Design play areas with permeable surface and adequate drainage. Drain to sump a minimum of 20 feet out from the playground curbing or to storm drain.

G204007 1.2 PLAYING FIELDS

Provide playing surfaces in accordance with this RFP. Use synthetic turf systems approved by the reviewing Government Landscape Architect or Civil Engineer.

G204090 OTHER SITE IMPROVEMENTS

Provide other site improvements in conformance to the BEAP or Installation Appearance Plan and to the requirements of UFC 4-010-01.

G204090 1.1 DUMPSTER PADS AND ENCLOSURES

Provide 200 mm (8 inch) thick non-reinforced portland cement concrete pavement dumpster pads sized larger than what is required to accommodate the specific dumpsters to be used at the site. Make the concrete pad large enough to accommodate the front wheels of the carrying truck.

The dumpster enclosure's materials and style shall complement the adjacent buildings and facilities. Walls should be at least 1.83 meters (6 feet) tall. Where possible, orient the openings of enclosures away from building entrances and main streets.

G2050 LANDSCAPING

Landscape area is defined as all permeable areas within the project boundaries not covered by buildings, roads, parking lots, sidewalks, and other non-permeable areas. All site areas disturbed by construction must receive landscape improvements.

G2050 1.1 DESIGN

The design of landscaped areas must be in accordance with Presidential Executive Order 13148 of April 2000, with a goal to reduce fertilizers, pesticides, and water use. The intent is to achieve a base-wide ratio of 20 percent maximum non-native plants and 80 percent minimum locally or regionally native plants. Do not use plants deemed invasive by the project state or region's Exotic Pest Plant Council, State Department of Agriculture or local chapter of the American Society of Landscape Architects as a threat to ecosystems or agriculture. Select only plant species which require little or no supplemental irrigation after the initial establishment period. Only nursery-grown plants are acceptable. Cover all non-paved site areas disturbed by construction operations with plant material or inorganic mulch. Stabilized soil, decomposed granite, and organic mulch are not acceptable as ground covers. Provide landscape architectural work in accordance with UFC 3-201-02, *Landscape Architecture*. For all projects with planting and or irrigation areas, utilize the design services of a Landscape Architect licensed in the state of the project. The Landscape Architect of Record must visit the site at least once prior to design, twice during construction, and quarterly during the Establishment Period, including the Establishment Period start and completion. The Landscape Architect of Record must attend the kickoff partnering meeting and CDWs. Courtyards and plazas are to be designed by the Landscape Architect. For the CDW, provide a Site Analysis Plan to demonstrate the design thought process. It is the Contractor's responsibility to coordinate between disciplines including architecture, civil engineering, electrical engineering, mechanical engineering, fire protection, and landscape architecture. Coordinate location of utilities,

structures, and equipment. For projects in dry climates (arid and semi-arid), eliminate or minimize the use of turf, except when needed for active or passive recreation.

The Landscape Architect-of-Record is required to submit 5 sample boards of landscape materials. Sample boards to include but not limited to colors, finishes, textures of hardscape paving, walls, signs, monument piers, inorganic mulches, organic mulches, and other site improvements. Include cut sheets of all proposed plant material.

G205001 FINE GRADING AND SOIL PREPARATION

See Section G10, Site Preparation. Provide 4 inches (102 mm) of topsoil with appropriate soil amendments, as recommended by a current soil composition test, for all areas to be planted with turf grass.

G205002 EROSION CONTROL MEASURES

See Section G10, Site Preparation.

G205003 TOP SOIL AND PLANTING BEDS

See paragraph titled, G205005 PLANTINGS.

G205004 SEEDING, SPRIGGING, AND SODDING

Hydroseed areas that are to be seeded and are larger than 1,000 square feet (92.90 square meters). Hydroseed mix composition must be appropriate for surrounding land use and compatible and consistent with local application rates, seed availability and established practice in the project area. If project dates are unknown, specify required planting dates or alternative species for different seasons. Apply seed at a time best suited for germination of the selected species. Seeded areas are required to achieve a 95-percent coverage of the selected species and be weed free at the end of the Establishment Period.

G205005 PLANTINGS

G205005 1.1 EXISTING PLANT MATERIAL TO REMAIN OR BE TRANSPLANTED

Preserve existing trees to the greatest extent possible. Identify preserved trees on the plans with tree species, caliper and dripline. Tag trees to be saved with plastic or vinyl tape tied to the tree caliper. Protect existing trees by fencing planting areas to remain from compaction and any other damage with a barrier of metal poles a maximum 8 feet (2.4 meter) on center with plastic netting to a minimum of 10 feet (3.0 meter) radius from outside of the tree's trunk. Where tree drip lines are greater than 10 feet (3.0 meter) from the tree's trunk, locate barrier fencing at the drip line of the tree. Install signs on each Tree Protection Zone fence indicating that the barrier must not be taken down or moved without the participation of a Certified Arborist. Ensure that the details and specifications clearly state that none of the following activities occur within the tree protection barricade: driving, parking, storing materials, dumping waste, concrete washout, adding fill soil, trenching, removing soil, grubbing, or any other disturbance to the tree or the associated roots. Do not allow debris from tree or stump removal operations to fall on or otherwise damage plants that are not scheduled for removal. Do not remove plastic

tape and barrier fencing until planting operations are ready to begin and or instructed by the Contracting Officer. Replace existing trees to remain or to be transplanted that are unhealthy, that die, or have 20 percent or more of their crowns that die during the establishment period with healthy plants of the same species or variety during the appropriate planting season. During the landscape establishment period, replace trees, turf, shrubs, and ground cover that are damaged or destroyed during construction operations by the Contractor at no additional cost to the Government. At the direction of the Contracting Officer, remove the existing tree and stump and replace it with trees of the same genus and species equal to the total caliper of the existing tree. Minimum caliper of replacement trees must be 4 inch (100 mm). Replace shrubs with 5 gallon (18.9 liter) size container, ground cover with flat containers planted at 8 inches (200 mm) on center, and turf with sod, all of the same genus and species.

G205005 1.2 UTILITIES

Do not place trees within 10 feet (3 meter) of any above or below-grade utility line or structure. Within roadway sightlines, mature shrubs must not be greater than 3 feet (1 m) in height and trees must be limbed up a minimum of 6 feet (2 m) so their mature growth will not obstruct views from vehicle intersections or points of vehicle ingress or egress. Coordinate utilities between the Landscape Architect and appropriate disciplines.

G205005 1.3 RECYCLING

Green waste: Contact the Public Works Department for potential green waste collection and hauling by the Government. Separate green waste not collected by the Government from construction debris and deliver to the base's or local landfill's green waste recycling area. Quantify and report diverted waste to the Contracting Officer.

G205005 1.4 PLANTING

G205005 1.4.1 Plant Quantities

Provide trees at the minimum rate of one (1) tree per 1,000 square feet (92.9 square meters) of Landscape Area. Parking areas must have a minimum of one (1) tree per every 5 parking spaces around the parking perimeter and one (1) tree per every 10 parking spaces within the parking area. Provide a minimum of one (1) tree in each end aisle planter. Total minimum quantities may be reduced only by the reviewing Government Landscape Architect. Tree quantities reduced by the Government Landscape Architect will be included on the ADD/DEDUCT List by the Contracting Officer. For bioretention areas, minimum quantities of trees, shrubs, and ground covers must be as required by State regulations. Provide a minimum tree size of 24 inch (600 mm) box/2 inch (50 mm) caliper, or if within an anti-terrorism zone provide a minimum size of 36 inch (910 mm) box/3 inch (76 mm) caliper. For trees within concrete or other non-permeable paved areas, allow a minimum non-paved planting area of 4 feet by 8 feet (1.2 m by 2.4 m) per tree.

For dry climates (arid and semi-arid) only: Plant a minimum of forty percent (40%) of the landscaped areas with shrubs and groundcover so that at 50 percent (50%) plant maturity, they will form mass plantings.

Utilize a minimum ratio of 60 percent (60%) 5 gallon (18.9 liter) shrubs or groundcover and 40 percent (40%) 1 gallon (3.79 liter) shrubs or groundcover. The remaining sixty percent (60%) of the landscape area may be inorganic mulch, planted or a combination thereof. For inorganic mulch, provide 3 inch (76 mm) depth of 3/4-inch (19 mm) and smaller rock, and for larger than 3/4-inch (19 mm) size, assure complete ground surface coverage. Provide plant material calculation summary matrix on planting plan.

For all other climate zones: Plant the majority of shrubs at major entrances to buildings and at other important planting zones that are specific to each site. The overall design intent should be to plant mostly trees and turf, with shrubs and ground covers used sparingly, to reduce maintenance costs while still providing for functional planting requirements (e.g., soil stabilization, energy conservation, force protection, and aesthetics). Provide a minimum size 3 gallon (11.4 liter) container for shrubs and 1 gallon (3.79 liter) container for ground covers.

G205005 1.4.2 Plant Quality

All plants must comply with ANSI Z60.1 and ANSI A300, Part 1, current editions. All plants must be in a healthy, disease and pest free condition. All seed, sod, and sprigs must be State Certified.

G205005 1.4.3 Plant Selection

The reviewing Government Landscape Architect has final approval authority on all selected plant material. Species deemed unsuitable for planting by the Government Landscape Architect will not be allowed.

G205005 1.4.4 Plant Installation

Planting operations, including but not limited to planting soil mixes and fertilization, must comply with local established practices and agricultural extension service recommendations. Stake or guy new or transplanted trees with three stakes [2 inch x 2 inch x 8 feet (50 mm x 50 mm x 2.4 m) hardwood], or three guy cables [five-strand, 3/16 inch (5 mm) diameter galvanized steel cable]. Install linear tree root barriers at the edge of paving where trees are planted within 10 feet (3 m) of sidewalks, curbs, walls, columns, and other hard surface areas. Do not encircle tree root balls with root barriers.

G205005 1.4.5 Edging Materials and Mulching Materials

Provide 3/16 inch (5 mm) minimum thick by 5 inch (127 mm) minimum deep aluminum edging or 6 inch (150 mm) by 6 inch (150 mm) minimum, concrete edging dividing all turf and planting beds and dividing all planted and non-planted inorganic mulch areas. Provide stake type and spacing for aluminum edging per manufacturer's recommendations. Plastic edging is not allowed. Mulch planted areas not mulched with inorganic mulch with a 3-inch (75 mm) depth of organic shredded hardwood mulch. For inorganic mulch where rock cobble size is greater than half of the profile depth, provide Â¾ inch (19 mm) comparable color and shape rock mulch in bottom half of profile. For dry climates

only, organic mulch must be shredded redwood bark unless approved otherwise by the reviewing Government Landscape Architect. All mulches (organic and inorganic) must not be subject to sloughing off on sloped sites. Submit samples of mulches to the reviewing Government Landscape Architect for approval prior to installation. Decomposed granite must not be used. Provide a 3-inch (75 mm) depth of organic shredded hardwood mulch between plants used to form a mass (in dry climates, mulch in the remainder of planting beds with inorganic mulch). Install mulching materials prior to the start of the Establishment Period.

G205005 1.4.6 Fertilizer

Fertilize all transplanted trees, new trees, shrubs, ground covers, turf, perennials and ornamental grasses as recommended by local agricultural extension services.

G205005 1.4.7 Weed Fabric and Erosion Control Fabric

Provide a weed barrier fabric of sheet polypropylene or polyester fabric specifically designed for weed control purposes beneath all planted or mulched non-planted areas. Treat fabric for protection against deterioration due to ultraviolet radiation. Fabric must be a minimum 99 percent opaque to prevent photosynthesis and seed germination from occurring, yet allowing air, water and nutrients to pass through to the roots. Minimum weight must be 5 ounces per square yard (0.11 kg per square meter) with a minimum thickness of 20 mils (0.50 mm) with a 20 year minimum guarantee. Provide a biodegradable product designed specifically for erosion control on all sloped areas 3 (horizontal):1 (vertical) and steeper in slope. Do not place weed fabric over the root balls of trees.

G205005 1.4.8 Drainage

Provide for proper grading and drainage of turf and planting areas. Provide sub-surface drainage where soil or other conditions do not allow surface drainage. Do not drain roof gutters into planter areas.

G205007 IRRIGATION SYSTEMS

G205007 1.1 IRRIGATION

Where an irrigation system is required per other parts of this RFP, provide a permanent, below-grade system. Provide 100 percent sprinkler head to head coverage. Provide pop-up heads in turf and landscape zones when adjacent to walks, roads, parking lots, or in sparsely planted landscape areas where pedestrians may circulate. Provide pop-up heads project-wide on high-traffic sites such as, but not limited to, dining, housing, entertainment, daycare, education and recreation facilities. For dry climates, provide deep root watering systems for trees. Verify adequate water pressure for irrigation purposes and provide booster pumps and or pressure regulation as required. Provide minimum 18 inch (450 mm) cover over pressurized (mainline) PVC irrigation pipe and 12 inch (300 mm) cover over non-pressurized (lateral line) PVC irrigation pipe. 1/2-inch (13mm) pipe is not allowed. Provide pressurized (mainline) pipe in conformance with ASTM D1785, PVC 1120, Schedule 40. Provide non-pressurized (lateral)

pipe in conformance with ASTM D2241, PVC 1120 SDR 21, Class 200. The Landscape Contractor must test the entire system in the presence of the Contracting Officer and Landscape Architect-of-Record to ensure proper performance. All irrigation components must be commercial or institutional quality. Provide rain shut-off device and watertight splices. Provide sprinkler heads, bodies and nozzles of the same manufacturer. All irrigation heads on the same valve must have nozzles with matched precipitation rates.

G205007 1.2 OPERATION AND CONTROL

Assure systems will automatically operate on an "irrigation window" between 2000-0530. Provide compatible and fully functional control if a central control system exists on base. Otherwise, provide evapotranspiration-measuring control with flow meter and master valve with controller capable of indicating visible or auditory notification, such as a blinking light or beeping sound, of system shut-off.

G205007 1.3 ZONING

Provide separate control valves for differing plant species coefficients, landscape coefficients, and solar exposures, for areas with differing irrigation head types or differing precipitation rates, and top and bottom of slopes. Provide a separate irrigation backflow prevention device and water meter. Turf, trees, and shrubs/groundcover are not allowed on the same valve. Provide separate concrete valve box with cast iron lid and valve ID for each valve and wire splice. Provide quick coupling valves at 100 feet (30 m) on center. Provide in-head check valves for sloped areas with 0.5 feet (150 mm) or more in elevation change.

G205007 1.4 TEMPORARY IRRIGATION

Provide ultra-violet resistant pipe and fittings for above-grade, temporary irrigation. Only non-pressure pipe is allowed above grade. Install irrigation systems intended to remain in place longer than one year below grade.

G205007 1.5 NON-POTABLE IRRIGATION

Provide lavender-colored pipe, sprinkler head and quick coupler caps, valve tags, signage, and associated filtration equipment.

G205007 1.5.1 Controller Charts

Provide one chart for each new controller or existing re-sequenced controller. The chart must be an actual plan reduced to fit inside maximum dimensions of the controller housing. Use black line print for chart and a different color to indicate each station area of coverage. After chart is completed and approved for final acceptance, seal chart between two 20 mil (0.5 mm) pieces of clear plastic. Affix the chart to the inside of the controller cabinet door using approved mastic or fastening system. Provide one additional copy of the chart in electronic format. Additionally, the Landscape Architect of Record must provide the Base with a maintenance plan and schedule as part of the turn-over items.

-- End of Section --

SECTION G30

SITE CIVIL/MECHANICAL UTILITIES
09/15

G30 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

G30 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

G30 1.1.1 Industry Standards and Codes

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

G30 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-201-01, Civil EngineeringUFC 3-230-01, Water Storage, Distribution, and TransmissionUFC 3-240-01, Wastewater CollectionUFC 3-210-10, Low Impact DevelopmentUFC 3-401-01, Mechanical Engineering)
UFC 1-200-02	High Performance and Sustainable Buildings
UFC 3-600-01	Fire Protection Engineering

UFC 3-800-10N	Environmental Engineering for Facility Construction

G30 1.2 QUALITY ASSURANCE

Materials and assemblies installed in the work must be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Remove items found not to be in compliance, or take corrective measures, to assure compliance with the referenced standard. Perform field tests and provide labor, equipment and incidentals required for testing.

G30 1.2.1 Materials

All materials must be new, and bear the label of the standardizing agency whenever standards have been established and label service is normally and regularly furnished by the agency. All equipment provided must be listed and suitably labeled for the specified purpose, environment, and application and installed in accordance with manufacturer’s recommendations.

G30 1.2.2 Additional Work

Provide such other labor and materials as are required for a complete and usable system in accordance with the requirements of the criteria listed, regardless of whether such materials and associated labor are called for elsewhere in this RFP.

G30 1.2.3 Qualifications of Well Drillers for Water Supply Wells

If required by the state waterworks' regulations, the well driller must be certified by the state and remain certified while constructing the well.

G30 1.2.4 Qualifications of Coating Contractors for Water Storage Tanks

All contractors and subcontractors that perform surface preparation or coating application must be certified by the Society for Protective Coatings (formerly Steel Structures Painting Council) (SSPC) to the requirements of SSPC QP 5 for the inspection firm prior to contract award, and remain certified while accomplishing any surface preparation or coating application. The Coating Inspector must also be certified to Level II for exterior and Level III for interior coatings prior to and during the project.

G30 1.2.5 Qualifications of Oil/Water Separator Manufacturers

Manufacturers must have five years of experience producing packaged oil/water separator units of similar size.

G30 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Compliance with the requirements will be determined by a review of the design

and construction submittals and by field inspection. See Section 01 33 10.05 20, *Design Submittal Procedures*, and Section 01 33 00.05 20, *Construction Submittal Procedures*, for additional requirements.

Verify satisfactory utility system performance via Performance Verification Testing, as detailed in this section of the RFP. Verify satisfactory performance also via testing as detailed in the paragraph, "Field Quality Control", in applicable UFGS Specification Sections utilized.

G30 1.3.1 Water Supply Well Performance Verification

Upon completion of the permanent well, conduct performance testing for well capacity, drawdown and pump equipment. Conduct water quality testing in accordance with AWWA A100 and its appendices and state regulations.

G30 1.3.2 Water Distribution System Verification Testing

Provide testing on water mains and service lines in accordance with the state waterworks' regulations and the following:

a. Ductile Iron and other materials: AWWA C600.
b. PVC: AWWA C605.

Where water mains and water service lines provide fire service, test in accordance with NFPA 24.

Do not begin testing on any section of a pipeline where concrete thrust blocks have been provided until at least 5 days after placing of the concrete.

G30 1.3.3 Fire Distribution System Verification Testing

Test water mains and water service lines providing fire service or water and fire service in accordance with NFPA 24. The additional water added to the system must not exceed the limits given in NFPA 24.

G30 1.3.4 Water Booster Pump Station Verification Testing

Test the water booster pump station in accordance with state regulations. Conduct testing on discharge and site piping in accordance with tests for water distribution mains; see G30, paragraph 1.3.2. Test pumps, controls, and alarms, in operation, under design conditions to ensure proper operation of all equipment.

G30 1.3.5 Sanitary Sewer Distribution System Verification Testing

Provide testing on sewer mains and laterals in accordance with state regulations.

G30 1.3.5.1 Deflection Test

Deflection of pipe in the installed pipeline under external loads must not exceed 4.5 percent of the average inside diameter of pipe, in accordance with ASTM D 2412.

G30 1.3.5.2 VISUAL TEST

Perform a visual inspection of the existing sewer before making a connection to the existing sewer line. Verify existing sewer line does not connect to or drain to the storm drainage system. Visually inspect downstream manholes connecting the existing sewer as well as the upstream and downstream manholes where the point of connection will be made to verify that there is no potential for cross connection to the storm sewer system. Perform visual inspection in the presence of the Contracting Officer's Representative and Public Works PW6 field support. Obtain approval from the Contracting Officer before making the connection.

Perform a dye check from the project to the first manhole on the next active sewer branch main downstream from the sewer branch main used as the project point of connection. Testing shall continue till the dye visually confirms the design connection is appropriate. Dye shall be a nontoxic non-staining sewer tracing dye. During the test the contractor shall monitor the storm drainage system downstream from the project, either manholes or outfalls for any sign of cross connection.

Perform a smoke test on the project sewer. Testing will verify that project storm drainage inlets or drains have not been connected to the sanitary sewer.

These tests shall be observed by the Contracting officer's representative and the utility operator's inspector.

G30 1.3.5.3 Leakage Tests

Test lines for leakage by either infiltration tests or exfiltration tests, or by low-pressure air tests. Prior to testing for leakage, backfill trench up to at least lower half of pipe. When necessary to prevent pipeline movement during testing, place additional backfill around pipe sufficient to prevent movement, but leaving joints uncovered to permit inspection. The leakage allowance is indicated in AWWA C 600 for ductile iron pipelines; AWWA C 605 for polyvinyl chloride pipelines; and the state sewerage regulations, whichever is more stringent. When leakage or pressure drop exceeds the allowable amount make satisfactory correction and retest pipeline section in the same manner. Correct visible leaks regardless of leakage test results.

a. Exfiltration Tests:

ASTM C 969M (ASTM C 969) and perform calculations in accordance with its Appendix.

b. Low-pressure Air Tests:

i. Pipelines: ASTM C 924M (ASTM C 924) and perform calculations in accordance with its Appendix.

ii. PVC plastic pipelines: UBPPA UNI-PUB-6 and perform calculations in accordance with its Appendix.

G30 1.3.5.4 TV Inspection for Sanitary Sewer

Post-installation TV inspection will be performed on all segments of the installed system when the total footage of sanitary sewer mains installed in the contract is in excess of 300 feet.

Complete the post-installation TV inspection to confirm that the completed lines are free of defects. For video recordings include an audio track recorded by the inspection technician during the actual inspection work describing the parameters of the line being inspected. The minimum information to be included is the pipe material, pipe size, starting and stopping manholes and descriptions of any features as they occur. Video recording playback must be at the same speed that it was recorded. Permanently label CDs / DVDs according to their contents; CDs / DVDs will become the property of the Government.

Provide all TV inspections of sanitary sewer mains in accordance with the Pipeline Assessment and Certification Program as sponsored by the National Association of Sewer Service Companies (NASSCO). Prior to initiating CCTV inspection, provide copies of PACP Certification of the operators that will be performing the work.

Complete pipe segments and manhole work, including pipe penetrations, manhole benches, main line and manhole visual inspection, pressure testing, deflection and leakage tests on a section of line (manhole to manhole) prior to performing TV.

Complete post-installation TV inspection in the presence of the Contracting Officer or his designated representative.

The importance of accurate measurements is emphasized. The meter device must be accurate to one tenth of a foot.

Utilize the full capabilities of the camera equipment to document the completion and the conformance of the work to the Contract Documents. Provide a full 360Â° view of the pipe, joints and service connections. Move the camera through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. The maximum speed must be no greater than 30 feet per minute. Use manual wenches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with the proper documentation of the sewer conditions to move the camera through the sewer line.

Once video recording has commenced, the recording must be continuous, without interruption, until the termination manhole is reached.

Provide a color video showing the completed work. Prepare and

submit Television Inspection Logs providing location of service connections along with the location of any discrepancies.

Keep computer printed location records (Television Inspection Logs) and clearly show the location and orientation in relation to an adjacent manhole for each point observed during the TV inspection. Record features of significance such as locations and orientations of service connections, pipe deflections, leaks, rolled or dislodged gaskets, sags or bellies in the line, or wide joints.

Document noted defects and lateral connections as color digital files and color hard copy prints. Photo logs must accompany each photo submitted.

Prior to submission of the TV inspection video, Television Inspection Logs, and digital photographs to the Contracting Officer, review the submittal items to ensure that they meet the quality criteria set forth in this specification. A copy of such video along with the Television Inspection Logs and Digital photographs must be supplied to the Contracting Officer within five (5) business days of completion of the video-inspection. In the event that the video, Television Inspection Logs or digital photographs are deemed of poor quality or substandard by the Contracting Officer, the videos, and / or Television Logs, or digital photographs will be returned and a re-inspection provided by the Contractor, at no additional cost to the Government.

G30 1.3.6 Sanitary Sewer Manholes Verification Testing

Provide a visual inspection of all manholes for proper grade and water tightness. Provide testing on sanitary sewer manholes in accordance with state regulations. At minimum, perform hydraulic testing in accordance with ASTM C 969/C 969M.

G30 1.3.7 Wastewater Pump Station Verification Testing

Test the wastewater pump station in accordance with state regulations. Conduct testing on discharge piping and force main in accordance with tests for water distribution mains; see G30, paragraph 1.3.2. Test pumps, controls, and alarms, in operation, under design conditions to ensure proper operation of all equipment.

G30 1.3.8 Storm Sewer System Verification Testing

G30 1.3.8.1 Deflection Test

Deflection of pipe in the installed pipeline under external loads must not exceed 4.5 percent of the average inside diameter of pipe, in accordance with ASTM D 2412.

G30 1.3.8.2 TV Inspection for Storm Sewer Under Pavements

Post-installation TV inspection will be performed on all segments of the installed system when the total footage of storm

sewer lines installed in the contract is in excess of 300 feet.

Complete the post-installation TV inspection to confirm that the completed lines are free of defects. For video recordings include an audio track recorded by the inspection technician during the actual inspection work describing the parameters of the line being inspected. The minimum information to be included is the pipe material, pipe size, starting and stopping manholes and descriptions of any features as they occur. Video recording playback must be at the same speed that it was recorded. Permanently label CDs / DVDs according to their contents; CDs / DVDs will become the property of the Government.

Provide all TV inspections of storm sewer lines in accordance with the Pipeline Assessment and Certification Program as sponsored by the National Association of Sewer Service Companies (NASSCO). Prior to initiating CCTV inspection, provide copies of PACP Certification of the operators that will be performing the work.

Complete pipe segments and manhole work, including pipe penetrations, manhole benches, main line and manhole visual inspection, pressure testing, and deflection test on a section of line (manhole to manhole) prior to performing TV.

Complete post-installation TV inspection in the presence of the Contracting Officer or his designated representative.

The importance of accurate measurements is emphasized. The meter device must be accurate to one tenth of a foot.

Utilize the full capabilities of the camera equipment to document the completion and the conformance of the work to the Contract Documents. Provide a full 360Â° view of the pipe, joints and service connections. Move the camera through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. The maximum speed must be no greater than 30 feet per minute. Use manual wenches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with the proper documentation of the sewer conditions to move the camera through the sewer line.

Once video recording has commenced, the recording must be continuous, without interruption, until the termination manhole is reached.

Provide a color video showing the completed work. Prepare and submit Television Inspection Logs providing location of service connections along with the location of any discrepancies.

Keep computer printed location records (Television Inspection Logs) and clearly show the location and orientation in relation to an adjacent manhole for each point observed during the TV inspection. Record features of significance such as locations and orientations of service connections, pipe deflections,

leaks, rolled or dislodged gaskets, sags or bellies in the line, or wide joints.

Document noted defects and lateral connections as color digital files and color hard copy prints. Photo logs must accompany each photo submitted.

Prior to submission of the TV inspection video, Television Inspection Logs, and digital photographs to the Contracting Officer, review the submittal items to insure that they meet the quality criteria set forth in this specification. A copy of such video along with the Television Inspection Logs and Digital photographs must be supplied to the Contracting Officer within five (5) business days of completion of the video -inspection. In the event that the video, Television Inspection Logs or digital photographs are deemed of poor quality or substandard by the Contracting Officer, the videos, and / or Television Logs, or digital photographs will be returned and a re-inspection provided by the Contractor, at no additional cost to the Government.

G30 1.4 DESIGN SUBMITTALS

Design Submittals must be in accordance with UFGS section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-201-01, *Civil Engineering*, and UFC 3-401-01, *Mechanical Engineering*.

Provide sustainability submittals in accordance with UFGS 01 33 29.05 20 *Sustainability Reporting for Design-Build*.

G30 1.5 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

All test reports.

Provide sustainability submittals in accordance with UFGS 01 33 29.05 20 *Sustainability Reporting for Design-Build*.

G30 1.6 COORDINATION

To the extent that site work is indicated on the RFP drawings, verify that the locations and inverts of all site utility lines are coordinated with building utility lines. If necessary, make adjustments to the locations and inverts indicated on the RFP drawings in accordance with applicable codes and standards.

G30 1.7 ANTITERRORISM (AT) STANDARDS

Incorporate the minimum AT standards indicated in UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*.

G30 1.8 BACKFLOW PREVENTION

Submit backflow prevention training certificates and backflow preventer devices certification in accordance with Section 01 50 00.05 20, *Temporary Facilities and Controls for Design-Build*.

G30 1.9 WATER STORAGE TANK

Submit a certificate signed by a registered professional engineer providing a (1) description of the entire tank and foundation structural design loading conditions; (2) description of structural design methods and codes used in establishing allowable stresses and safety factors; (3) statement that the structural design has been checked by experienced engineers specializing in hydraulic structures to ensure that design calculations for member sizes, dimensions and fabrication processes are as prescribed by ACI and AWWA standards; and (4) certification that the completed work was inspected in accordance with AWWA D100 or AWWA D103 as applicable.

G30 1.10 NACE CERTIFIED CATHODIC PROTECTION SPECIALIST QUALIFICATIONS

Submit qualifications of specialist prior to site welding. Submit documentation of NACE certification. Certifications must not be more than one year old.

G30 1.11 EXCAVATION, BACKFILLING AND COMPACTION OF UTILITIES

Refer to Section G10, *Site Preparation*.

G30 1.12 DELIVERY, STORAGE AND HANDLING OF MATERIALS

Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials on site in enclosures or under protective covering. Store plastic piping, jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes, fittings, valves, and hydrants free of dirt and debris. Handle in a manner to ensure delivery to the trench in sound undamaged condition. Take special care to avoid injury to coatings and linings on pipe and fittings; make satisfactory repairs if coatings or linings are damaged. Carry, do not drag pipe to the trench.

G3010 WATER SUPPLY

G3010 1.1 WATER SYSTEM DESIGN

Determine domestic and fire demands for the facility and shall verify the design of all components of the domestic and fire protection supply systems. The water system design and construction must be in accordance with UFC 3-230-01, *Water Storage, Distribution, and Transmission;* the state waterworks' regulations, and the utility provider's requirements. Design the water supply systems to provide required flows and maintain residual pressures based upon peak demands.

If the new water system is an extension of an existing water system, obtain all necessary static pressure, residual pressure and flow characteristics of the existing distribution system by actual field tests. Conduct flow and pressure tests and provide design calculations that show the existing lines

are capable of handling the additional flows. Connect the new water system to the nearest existing fitting or water linecapable of handling the additional flows.

Design the connections to the water system including the necessary meter assemblies and backflow-preventing devices in accordance with the requirements of the Activity or utility provider and the state waterworks regulations.

Wherever possible, locate valve boxes and all other utility access structures out of paved areas.

G301001 WELL SYSTEMS

The potable water well system must be designed and constructed in accordance with AWWA A100 and its appendices; the state waterworks' regulations, and the system owner's preferences and requirements.

G301001 1.1 WATER METER

Provide a water meter on the well pump discharge piping aboveground in a pump enclosure or in a meter vault underground. Provide type of water meter and remote reading capability in accordance with system owner's preferences and requirements: AWWA C700, displacement type; AWWA C701, turbine type; or AWWA C702, compound type.

G301001 1.2 TEST HOLE

Drill test hole(s) at the well site before construction of the permanent well to determine the existing site-specific geologic/hydrologic conditions and groundwater-quality parameters. A test hole may be incorporated into the finished construction provided it meets the requirements for a finished well. Seal test holes not used in finished construction as recommended in accordance with AWWA C654 and the state waterworks' regulations. Upon completion of test hole, provide recommendations for permanent wells and submit data obtained at each well site. Include with the recommendations the appropriate depth, details of construction, length and location of screens, screen openings, gravel size, grout, and an estimation of the quantity of water that can be obtained from each water-bearing stratum and from each completed well. Submit electric log, a drillers log drawn to scale with coarseness and fineness modulus of each strata, time penetration log (time to drill through each formation), and sieve analysis to substantiate recommendations.

G301001 1.3 WELL CONSTRUCTION

G301001 1.3.1 Well Development

Provide well development in accordance with AWWA A100 and the state waterworks' regulations.

G301001 1.3.2 Disinfection

Disinfect well, equipment, and material in accordance with AWWA C654 and the state waterworks' regulations. Provide a sanitary seal for the well to prevent contamination until the pump foundation and pump

are installed on the well.

G301001 1.4 ABANDONMENT OF EXISTING WELLS

Abandon and seal existing wells in accordance with AWWA A100 and the state waterworks' regulations.

G301002 POTABLE WATER DISTRIBUTION

G301002 1.1 WATER SYSTEM DESIGN

Provide all materials, equipment, labor, testing, and miscellaneous related items for water distribution mains and service lines to the facility and connections to the existing water system in accordance with UFC 3-230-01, *Water Storage, Distribution, and Transmission*; the utility provider's requirements; and the state waterworks' regulations; whichever is more stringent.

Determine available flow at the residual pressure at each point of connection by conducting flow tests in accordance with AWWA M17 and NFPA 291.

Water main piping, service lines, fittings, valves, accessories and all other materials must meet the American Water Works Association (AWWA) standards for a minimum system working pressure of 150 psi (1050 kPa).

G301002 1.2 WATER DISTRIBUTION MAINS

For underground applications, water mains 12 inches (300 mm) in diameter and less must be ductile iron or PVC. Water mains deeper than 10 feet (3.0 m) or larger than 12 inches (300 mm) in diameter must be ductile iron.

For aboveground applications, water mains shall be flanged ductile iron pipe.

G301002 1.2.1 Materials

a. Ductile Iron Pressure Pipe

1) Pipe: AWWA C151, Pressure Class 350.

2) Fittings: AWWA C110 or AWWA C153.

3) Interior Lining: AWWA C104.

4) Exterior Protection (if required): AWWA C105, polyethylene encasement.

b. PVC Pressure Pipe

1) Pipe: AWWA C900, Pressure Class 150.

2) Fittings: Ductile Iron (AWWA C110 or AWWA C153).

c. Flanged Ductile Iron Pipe

1) Pipe: AWWA C115 and its appendices.

2) Fittings: AWWA C110 or AWWA C153.

3) Lining: AWWA C104.

G301002 1.2.2 Installation

a. Ductile Iron: AWWA C600.
b. PVC: AWWA C605.

Provide nondetectable warning tape and a continuous length of tracer wire for the full length of each run of nonmetallic piping below grade. Warning tape to be color coded with warning and identification of utility type imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (utility type) LINE BELOW" or similar wording. Color to be blue for potable water systems and purple for nonpotable, reclaimed water, and irrigation lines. Terminate tracer wire above grade at valve boxes and at exterior of building.

G301002 1.2.3 Connections to Existing Water Lines

Make connections to existing water lines after approval from the system owner is obtained and with a minimum interruption of service on the existing line. Make connections to existing lines under pressure in accordance with the recommended procedures of the manufacturer of the pipe being tapped.

G301002 1.3 WATER SERVICE LINES

Water service lines less than 4 inches (100 mm) in diameter must be copper tubing or PVC. Water service lines 4 inches (100 mm) and 6 inches (150 mm) in diameter must be ductile iron pipe and PVC pressure pipe; see G301002, paragraph 1.2, "Water Distribution Mains" for additional requirements for ductile iron and PVC piping.

G301002 1.3.1 Materials

a. Copper Tubing

1) Pipe: ASTM B 88/B 88M, Type K.

2) Fittings for Solder-Type Joint: ANSI B16.8 or ASME B16.22.

3) Fittings for Compression-Type Joint: ASME B16.26, flared tube type.

b. PVC Pressure Pipe

1) Pipe: ASTM D1785, Schedule 40 or ASTM D 2241, with SDR rating for 160 psi (1.1 MPa) pressure rating.

2) Fittings: ASTM D 2466.

3) Joints: Elastomeric gaskets for pressure rating; solvent cement joints, ASTM D 2564.

G301002 1.3.2 Service Connections

Connect service lines 2-inch (50 mm) diameter or less to the main by a corporation stop and install a gate valve on service line below the frostline.

a. Ductile-iron water mains: AWWA C600.
b. PVC water mains: UBPPA UNI-PUB-8 and the recommendations of AWWA M23, Chapter 9, "Service Connections."

G301002 1.3.3 Installation

Install pipe, fittings and accessories in accordance with manufacturer's instructions.

a. Metallic Piping: applicable requirements of AWWA C600.
b. PVC: ASTM D 2774 and ASTM D 2855.

G301002 1.4 CORROSION PROTECTION

G301002 1.4.1 Insulating Joints

Provide insulating joints to prevent contact between dissimilar metals at the joint between adjacent sections of piping in accordance with the pipe manufacturer's recommendations. Ensure that there is no metal-to-metal contact between dissimilar metals after the joint has been assembled.

To prevent the possibility of bi-metallic corrosion, service lines of dissimilar metal to the water mains and the attendant corporation stops must be wrapped with polyethylene or suitable dielectric tape for a minimum clear distance of 3 feet (900 mm) from the main.

G301002 1.5 VALVES

Install valves with the same diameter and have the same joint ends as the mains to which they are installed. Each type of valve must be of one manufacturer.

G301002 1.5.1 Gate Valves

G301002 1.5.1.1 Location

Install valves at all new points of connection. At a minimum, locate valves to ensure that no more than two fire hydrants will be out of service in the event of a single break in a water main. Locate valves outside of pavement and heavy traffic areas whenever possible.

G301002 1.5.1.2 Gate Valves 3-inch (75 mm) and Larger in Diameter

a. Valves (20-inch and smaller in diameter): AWWA C509 or AWWA C515, nonrising stem and of one manufacturer.
b. Valves (greater than 20-inch in diameter): AWWA C500.
c. Valves for Indicator Post: AWWA C509 or AWWA C500, as indicated above, with indicator post flange in accordance with applicable requirements of UL 262.
d. Interior Coating: AWWA C550.

G301002 1.5.1.3 Gate Valves Smaller than 3-inch (75 mm) in Diameter

MSS SP-80, Class 150, solid wedge. Provide valves with flanged or threaded end connections, with unions on both sides of the valve and a handwheel operator.

G301002 1.5.1.4 Valve Box

Provide a cast iron, adjustable, valve box for each gate valve on buried piping. Provide valve boxes of a size suitable for the valve on which it is to be used with a minimum diameter of 5-1/4 inches (130 mm). Provide a round head and cast the word "WATER" on the lid.

G301002 1.5.2 Check Valves

Provide check valves sized 2-inches (50 mm) to 24-inches (600 mm) as swing-check type (AWWA C508) and with a protective epoxy interior coating conforming to AWWA C550. For underground applications, provide check valve in a valve vault.

G301002 1.5.3 Air Release, Air/Vacuum, and Combination Air Valves

AWWA C512 and AWWA M51.

G301002 1.5.4 Corporation Stops

If service lines 2—inch diameter or less are tapping water mains, provide corporation stops. The corporation stops must be ground key type, bronze, ASTM B61 or ASTM B62.

G301002 1.5.5 Installation of Valves

Make and assemble joints to valves as specified for making and assembling the same type of joints between pipe and fittings.

G301002 1.6 WATER METERS

Provide water meter and remote reading as required by the utility provider and in accordance with AWWA standards.

G301002 1.7 BACKFLOW PREVENTION

Provide backflow prevention and cross connection control in accordance with AWWA M-14 and governing local/state plumbing codes and waterworks' regulations.

G301002 1.8 FIRE HYDRANTS

Fire hydrants must be of one manufacturer and in accordance with UFC 3-600-01, *Fire Protection Engineering*. Coordinate with the project's fire protection designer of record. Provide protection for fire hydrants located in areas subject to vehicle damage. Fire hydrants must have National Standard threads on hose and pumper connections. Provide a 6 inch (150 mm) inlet, two 2.5 inch (62 mm) hose connections and one pumper connection sized to accommodate local fire department equipment requirements. Paint hydrants with at least one coat of primer and two coats of enamel paint. Barrel and bonnet colors shall be in accordance with UFC 3-600-01. Stencil hydrant number and main size on the hydrant barrel using black stencil paint.

a. Dry Barrel Fire Hydrants: AWWA C502 with frangible sections.
b. Wet Barrel Fire Hydrants: AWWA C503 or UL 246, "Wet Barrel" design, with breakable features.
c. Installation: Install hydrants with the pumper connection facing the adjacent paved surface. If there are two, paved adjacent surfaces, contact the Contracting Officer for further direction.

G301002 1.9 THRUST RESTRAINT

Provide thrust restraint for all piping, valves, fittings, and other appurtenances of the water distribution system.

Provide thrust restraint using restrained joints in accordance with pipe manufacturer's recommendations, AWWA C600 and if for fire service main, NFPA 24.

G301002 1.10 DISINFECTION

Disinfect new water piping and existing water piping affected by Contractor's operations in accordance with the state waterworks' regulations and AWWA C651.

G301003 POTABLE WATER STORAGE

G301003 1.1 POTABLE WATER STORAGE TANKS

Provide potable water storage facilities in accordance with UFC 3-230-01, *Water Storage, Distribution, and Transmission;* and the state waterworks' regulations.

An elevated, steel water storage tank must be in accordance with AWWA D100. A ground, steel water storage tank must be in accordance with AWWA D100 for welded tanks and AWWA D103 for bolted tanks.

G301003 1.2 TANK ACCESSORIES

Provide piping and valves in accordance with G301002. Install an altitude valve in a valve vault with appropriate shut off valves and check valve.

G301003 1.3 TANK COATINGS

All primer, intermediate coat and topcoat materials must be manufactured

by one manufacturer. Secondary materials, which are produced or are specifically recommended by the coating system manufacturer, may be used. Contrasting colors between coats are required.

G301003 1.3.1 Interior Coating System

Provide a commercially available interior coating system that is certified in accordance with AWWA D102, ICS-No. 2 or ICS-No. 5, and with NSF 61 and is in accordance with the state waterworks' regulations.

The color of the final coat must be approved in writing by the Contracting Officer before application begins.

Apply coatings at the following specified thickness:

Coat	Minimum DFT (mils)	Maximum DFT (mils)
Primer	3	5
Intermediate	3	5
Top	3	5
Total Systems	9	15

G301003 1.3.2 Exterior Coating System

Provide a commercially available, zinc/epoxy/polyurethane exterior coating system that is certified in accordance with AWWA D102, OCS-No. 6 and is in accordance with the state waterworks' regulations.

The color of the final coat must be approved in writing by the Contracting Officer before application begins.

Apply coatings at the following specified thickness:

Coat	Minimum DFT (mils)	Maximum DFT (mils)
Primer	3	5
Intermediate	3	5
Top	2	3
Total Systems	8	13

G301004 FIRE PROTECTION WATER DISTRIBUTION

G301004 1.1 GENERAL REQUIREMENTS

Refer to applicable portions of Section G301002 and Section D40, *Fire Protection Systems*. Water main piping, service lines, fittings, valves, accessories and all other materials must meet the American Water Works Association (AWWA) standards for a minimum system working pressure of 200 psi (1380 kPa).

G301004 1.2 DETECTOR CHECKS

UL 312; detector check includes bypass meter, piping, gate valves, check valve and connections to detector check valve. Set valve to allow minimal water flow through bypass meter when major water flow is required.

G301004 1.3 FIRE DEPARTMENT CONNECTIONS

UL 405.

G301004 1.4 INDICATOR POSTS

UL 789.

G301005 FIRE PROTECTION WATER STORAGE

Fire Protection Water Storage shall be in accordance with UFC 3-600-01 and NFPA 22.

G301006 NON-POTABLE WATER DISTRIBUTION

Refer to G301002; note that system disinfection is not required.

G301007 PUMPING STATIONS

If a pump station is allowed, provide a packaged booster pump station including pumps, piping, valves, sensors, controls, and accessories to maintain the water system pressure in accordance with UFC 3-230-01, *Water Storage, Distribution, and Transmission;* and the state waterworks' regulations.

The packaged booster pump station must have an Underwriter’s Laboratories (UL) label indicating compliance of the equipment under the packaged pumping systems UL listing category. This label must be inclusive of the entire station with enclosure so as to demonstrate compliance with the National Electrical Code requirements for working clearances and wiring procedures.

All interior coatings of pumps, piping, valves and other accessories must be a National Standard Foundation (NSF) Standard 61 certified material for potable water.

G301008 PACKAGED WATER TREATMENT PLANTS

Provide packaged water treatment plants in accordance with UFC 3-230-03, *Water Treatment;* for pipeline materials and the state waterworks' regulations for treatment plant requirements.

G3020 SANITARY SEWER

G3020 1.1 GENERAL REQUIREMENTS

The gravity sanitary sewage collection system must be designed and constructed in accordance with UFC 3-240-01, *Wastewater Collection;* and the state sewer collection and treatment regulations. Connect the new sanitary sewage collection system to the nearest existing sanitary manholes or sanitary line adjacent to the project site. Provide design calculations that show the existing system is capable of handling the additional flows.

In areas where chemicals and other substances may be stored (including mechanical and electrical rooms), eliminate floor drains or make provisions to prevent spills from entering the sanitary sewer system. If there is process flow from equipment, discharge can be hard piped, with air gap, to the sanitary sewer.

Wherever possible, locate manholes and all other utility access structures out of paved areas.

G302001 SANITARY SEWER PIPING

G302001 1.1 GENERAL REQUIREMENTS

Provide all materials, equipment, labor, testing, and miscellaneous related items to provide sanitary sewage lines necessary for collection and services from the buildings.

G302001 1.2 GRAVITY SEWER PIPING

Gravity sanitary sewer mains and laterals must be Ductile Iron, PVC or Polypropylene sewer pipe and fittings. Use Ductile Iron under roadways or at depths greater than 10 feet (3.0 m). PVC and Polypropylene may only be used under roadways or at depths greater than 10 feet (3.0 m) when written approval is received by the Government's Civil Reviewer or indicated in another part of the RFP.

G302001 1.2.1 Materials

a. PVC Gravity Sewer Pipe

1) Piping and Fittings: ASTM D3034 or ASTM F679, SDR 35.

2) Joints: ASTM D3212 and ASTM F477.

b. Ductile Iron Gravity Sewer Pipe

1) Piping: ASTM A746. Provide required Thickness Class based on design information and methods in ASTM A746.

2) Fittings: AWWA C110 or AWWA C153.

3) Joints: AWWA C111.

4) Interior Coating: AWWA C104.

5) Exterior Protection (if required): AWWA C105, polyethylene encasement.

c. Dual Wall and Triple Wall Polypropylene Sewer Pipe 12" to 60"

1) Piping and Fittings: ASTM F2736 and ASTMF2764/F2764M.

2) Joints: ASTM D3212 and ASTM F477.

G302001 1.2.2 Connections to Existing Lines

Obtain approval from the Contracting Officer before making a connection to an existing line. Conduct work so that there is minimum interruption of service on existing line and provide a new manhole at the connection point.

G302001 1.2.3 Installation

Install pipe, fittings and accessories in accordance with manufacturer's instructions.

a. PVC and Dual and Triple Wall Polypropylene: ASTM D2321. Do not use ASTM D2321 Class IV or V materials for bedding, haunching or initial backfill materials.
b. Ductile Iron: AWWA C600.

Provide nondetectable warning tape and a continuous length of tracer wire for the full length of each run of nonmetallic piping below grade. Warning tape to be color coded with warning and identification of utility type imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (utility type) LINE BELOW" or similar wording. Color to be green for sewer systems. Terminate tracer wire above grade at valve boxes and at exterior of building.

G302001 1.3 PIPING FOR CLEANOUTS

G302001 1.3.1 Materials

a. Cast-Iron Soil Pipe for Cleanouts

1) Pipe: ASTM A 74, service.

2) Joints: ASTM C 564 compression-type rubber gaskets.

3) Exterior Protection (if required): AWWA C105, polyethylene encasement.

G302001 1.3.2 Installation

Install cast iron pipe and fittings in accordance with the recommendations of the pipe manufacturer.

G302002 SANITARY SEWER MANHOLES & CLEANOUTS

G302002 1.1 GENERAL REQUIREMENTS

Provide all materials, equipment, labor, testing, and miscellaneous related items for the sanitary manholes in accordance with the following:

a. Set manhole rim elevations flush with finished surface of paved areas or 1 inch (25 mm) above finished grade in unpaved areas.
b. Resilient connectors for making joints between manhole and pipes entering manhole must conform to ASTM C 923/C 923M.
c. Provide drop manholes when a gravity sewer pipe enters a manhole at an elevation of 24 inches (610 mm) or more above the manhole invert.

G302002 1.2 PRECAST CONCRETE MANHOLES

ASTM C 478/C 478M; base and first riser must be monolithic.

Precast manhole sections must have:

a. ASTM C 990/C 990M butyl gaskets;
b. ASTM C 443/C 443M rubber O-ring joints; or
c. ASTM C 443, Type B gaskets.

G302002 1.3 CAST-IN-PLACE CONCRETE MANHOLES

Reinforced concrete; designed according to ASTM C 890 for A-16 (AASHTO HS20-44), heavy-traffic, structural loading. Provide concrete work in accordance with ACI 301/301M and ACI 350-01; provide a minimum compressive strength of 4000 psi (28 MPa).

G302002 1.4 MANHOLE FRAMES AND COVERS

Frame and cover must be cast gray iron, ASTM A48/A48M, Class 35B, cast ductile iron, ASTM A536, Grade 65-45-12, or reinforced concrete, ASTM C478 ASTM C478M. Frame and cover must be designed to accommodate the imposed live load. Stamp or cast the words "Sanitary Sewer" into covers so that it is plainly visible.

G302002 1.5 MANHOLE STEPS

a. Zinc-coated steel: 29 CFR 1910.27.
b. Plastic or rubber coating pressure molded to steel: ASTM D 4101, copolymer polypropylene; or ASTM C 443/C 443M, except shore A durometer hardness must be 70 plus or minus 5.

Aluminum steps or rungs will not be permitted.

Steps are not required in manholes less than 4 feet (1.2 m) deep.

G302002 1.6 MANHOLE CONSTRUCTION

Where a new manhole is constructed on an existing line, remove existing pipe as necessary to construct the manhole. Cut existing pipe so that pipe ends are approximately flush with the interior face of manhole wall, but not protruding into the manhole. For changes in direction of the sewer and entering branches into the manhole, make a circular curve in the manhole invert of as large a radius as manhole size will permit. For cast-in-place concrete, no parging will be permitted on interior manhole walls.

G302002 1.7 CONNECTIONS TO EXISTING MANHOLES

Center pipe connections to existing manholes on the manhole. Holes for the

new pipe must be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe. Cut the manhole in a manner that will cause the least damage to the walls.

G302002 1.8 CLEANOUTS

Construct cleanouts of cast iron soil pipe and fittings; see G302001, paragraph 1.3.

G302003 LIFT STATIONS AND PUMPING STATIONS

G302003 1.1 GENERAL REQUIREMENTS

If a pump station is allowed, provide all materials, equipment, labor, testing and miscellaneous related items for a packaged lift or pump station system for the facility in compliance with the UFC 3-240-01, *Wastewater Collection*; the state sewerage regulations; and the utility provider's requirements.

G302003 1.2 SUBMERSIBLE PUMPS

Provide pumps capable of handling raw wastewater and passing spheres of at least 3 inches (75 mm) in diameter. The pump's suction and discharge openings must be at least 4 inches (100 mm) in diameter.

Provide submersible type sewage pumps, with guide rail system. Include ASTM A48/A48M, Class 25, nonclog, cast-iron impeller; and hermetically sealed motor with moisture-sensing probe, mechanical seals, and waterproof power cable. Construct the guide rail system of stainless steel. Provide a stainless steel lifting chain for raising and lowering the pump in the basin.

G302003 1.3 GRINDER PUMPS

Provide grinder-type sewage pumps, with guide rail system. Include stainless steel or bronze impeller and hermetically sealed motor with moisture-sensing probe, mechanical seals, and waterproof power cable. Construct the guide rail system of stainless steel. Provide a stainless steel lifting chain for raising and lowering the pump in the basin.

G302003 1.4 SUCTION LIFT PUMPS

Provide pumps capable of handling raw wastewater and passing spheres of at least 3 inches (75 mm) in diameter. The pump's suction and discharge openings must be at least 4 inches (100 mm) in diameter.

Provide dry-chamber-mounting, vacuum-primed, nonclog sewage pumps located in dry compartment above wet pit. Include ASTM A48/A48M, Class 25, nonclog, cast iron impeller; mechanical or stuffing box seals; pedestal mounted motor; and suction piping extending to bottom of wet pit.

Provide suction-lift pumps capable of automatic rapid self priming and re-priming at the "lead pump on" elevation. Suction piping must not exceed 25 feet (7.6 meters) in total length. Priming lift at the "lead pump on" elevation must include a safety factor of at least 4 feet (1.2 meters) from the maximum allowable priming lift for the specific equipment at design

operating conditions. The combined total of dynamic suction-lift at the "pump off" elevation and the required net positive suction head at design operating conditions must not exceed 22 feet (6.7 meters).

G302003 1.5 PUMP MOTOR

Provide pump motor sized to accommodate pump operation along the entire impeller curve.

G302003 1.6 STATION PIPING WITHIN WET WELL AND VALVE VAULT

G302003 1.6.1 Piping Less than 4-Inch (100 mm) in Diameter

a. PVC Pressure Pipe

1) Pipe: ASTM D 1785, Schedule 80.

2) Fittings: Schedule 80 socket fittings, ASTM D 2467; Schedule 80 threaded fittings, ASTM D 2464.

G302003 1.6.2 Piping 4 inch (100 mm) Diameter and Larger

a. Flanged Ductile Iron Pipe

1) Pipe: AWWA C115 and its appendices.

2) Fittings: AWWA C110 or AWWA C153.

3) Lining: AWWA C104.

G302003 1.7 FORCE MAINS

G302003 1.7.1 Force Mains for Submersible and Suction Lift Pumps

Force mains must be at least 4 inches (100 mm) in diameter and must be either ductile iron or PVC pressure pipe.

a. Ductile Iron Pressure Pipe

1) Pipe: AWWA C151, Pressure Class 350.

2) Fittings: AWWA C110 or AWWA C153.

3) Interior Lining: AWWA C104.

4) Exterior Protection (if required): AWWA C105, polyethylene encasement.

b. PVC Pressure Pipe

1) Pipe: AWWA C900, Pressure Class 150. AWWA C905.

2) Fittings: Ductile Iron (AWWA C110 or AWWA C153).

G302003 1.7.2 Force Mains for Grinder Pumps

Force mains less than 4 inches (100 mm) in diameter must be PVC pressure

pipe:

a. PVC Pressure Pipe

1) Pipe: ASTM D 1785, Schedule 40 or ASTM D 2241, with SDR rating for 160 psi (1.1 MPa) pressure rating.

2) Fittings: ASTM D 2466.

3) Joints: Elastomeric gaskets for pressure rating; solvent cement joints, ASTM D 2564.

G302003 1.8 PIPING ACCESSORIES

G302003 1.8.1 Insulating Joints

Provide between pipes of dissimilar metals a rubber gasket or other approved type of insulating joint or dielectric coupling to effectively prevent metal-to-metal contact between adjacent sections of piping.

G302003 1.8.2 Accessories

Provide flanges, connecting pieces, transition glands, transition sleeves, and other adapters as required.

G302003 1.8.3 Flexible Flanged Coupling

Provide flexible flanged coupling applicable for sewage as indicated. Use flexible flanged coupling designed for a working pressure of 350 psi (2400 kPa).

G302003 1.9 VALVES

Provide suitable shutoff and check valves on the discharge line of each pump. Locate the check valve between the shutoff valve and the pump. Locate valves in accordance with state sewerage regulations. Check valves must be suitable for the material being handled and placed on the horizontal portion of the discharge piping except for ball check valves, which may be placed in the vertical run. Provide valves capable of withstanding normal pressure and water hammer. Use valves from one manufacturer.

G302003 1.9.1 Shut Off Valves

G302003 1.9.1.1 Shut Off Valves Less than 4 Inch (100 mm) in Diameter

PVC ball valves.

G302003 1.9.1.2 Shut Off Valves 4 Inch (100 mm) and Larger in Diameter

AWWA C509 or AWWA C515, nonrising stem, and flanged. Provide valves with handwheels that open by counterclockwise rotation of the valve stem. Provide epoxy coating in accordance with AWWA C550.

G302003 1.9.2 Check Valves

G302003 1.9.2.1 Check Valves Less than 4-Inch (100 mm) in Diameter

Neoprene ball check valve with integral hydraulic sealing flange, designed for a hydraulic working pressure of 175 psi (1200 kPa).

G302003 1.9.2.2 Check Valves 4-Inch (100 mm) and Larger in Diameter

AWWA C508, flanged. Provide a nonclog, swing check valve rated for not less than 175 psig (1200 kPa) working pressure capable of passing 3-inch (75 mm) diameter solids.

G302003 1.9.3 Air Relief Valves

Provide air relief valves at high points in the force main to prevent air locking in accordance with AWWA M51. Provide vacuum relief valves, where required, to relieve negative pressures on force mains.

G302003 1.10 IDENTIFICATION TAGS AND PLATES

Provide valves with tags or plates numbered and stamped for their usage. Use plates and tags of brass or nonferrous material and mounted or attached to the valve.

G302003 1.11 THRUST RESTRAINT

Provide thrust restraint for force mains, valves and other features of the wastewater distribution system.

Provide thrust restraint using restrained joints in accordance with pipe manufacturer's recommendations, AWWA C600 and if for fire service main, NFPA 24.

G302003 1.12 STATION CONTROL SYSTEM

G302003 1.12.1 Operating Controls

G302003 1.12.2 Alarm Controls

Provide alarms for all pumping and lift stations; at minimum provide alarms for high level, power failure, pump failure, unauthorized entry or any cause of station malfunction. Provide alarms as required by the pump manufacturer to obtain warranty.

G302003 1.12.3 Telemetry

If required, provide a telemetry system in accordance with state sewer collection and treatment regulations and system owner's requirements to relay alarms to a facility that is manned 24 hours a day.

G302003 1.13 UNDERGROUND ENCLOSURES

G302003 1.14 STATION ACCESSORIES

G302003 1.14.1 Ventilation

Provide covered wet wells with provisions for air displacement venting to the outside. Provide galvanized ASTM A 53/A 53M pipe with insect screening.

Provide adequate ventilation for all pump stations.

G302003 1.14.2 Metering

Provide devices for measuring wastewater flow at all pumping stations. Provide indicating, totalizing and recording flow measurement at pumping stations with a 1200 gpm (76 l/s) or greater design peak hourly flow. For smaller stations, provide elapsed time meters in conjunction with pumping rate tests.

G302003 1.14.3 Pipe and Valve Supports

Use schedule 40 galvanized steel piping conforming to ASTM A 53/A 53M for pipe and valve supports. Provide either ANSI B16.3 or ANSI B16.11 galvanized threaded fittings.

G302003 1.14.4 Miscellaneous Metals

Use stainless steel bolts, nuts, washers, anchors, and supports for installation of equipment.

G302004 PACKAGED SANITARY SEWER TREATMENT PLANTS

Provide packaged wastewater treatment facilities in accordance with UFC 3-240-02, *Domestic Wastewater Treatment;* for pipeline materials and the state sewer collection and treatment regulations for treatment plant requirements.

G302005 SEPTIC TANKS

Provide septic tanks in accordance with the state and treatment regulations and the International Private Sewage Disposal Code 2000.

G302006 DRAIN FIELDS

Provide drain fields in accordance with the state and treatment regulations and the International Private Sewage Disposal Code 2000.

G302090 OTHER SANITARY SEWER

G302090 1.1 OIL/WATER SEPARATOR

Refer to G303090.

G3030 STORM SEWER

Provide all materials, equipment, labor, testing, and miscellaneous related items to provide storm drainage collection system necessary to drain the site. The storm sewer collection system must be designed and constructed in accordance with UFC 3-201-01, *Civil Engineering*; the utility provider's requirements; and the state stormwater management laws and regulations. Design project site to prevent

stormwater runoff in excess of the capacity of the existing utility system.

G303001 STORM SEWER PIPING

G303001 1.1 PIPING

Storm sewer piping 12 inches (300 mm) and larger in diameter shall be reinforced concrete, dutile iron or corrugated steel; PVC, corrugated aluminum, polyethylene and polypropylene pipe may only be used when written approval is received by the Government's Civil Reviewer or indicated in another part of the RFP.

Subsurface drainage piping shall be perforated PVC or HDPE.

G303001 1.1.1 Materials

a. PVC Pipe

1) Piping and Fittings: ASTM D3034, SDR 35.

2) Joints: ASTM D3212 and ASTM F477.

b. Ductile Iron Pipe

1) Piping: ASTM A746. Provide required Thickness Class based on design information and methods in ASTM A746.

2) Fittings: AWWA C110 or AWWA C153.

3) Joints: AWWA C111.

4) Interior Coating: AWWA C104.

5) Exterior Protection (if required): AWWA C105, polyethylene encasement.

c. Reinforced Concrete Pipe

1) Circular Pipe: ASTM C76/C76M. Provide required Class based on design information and methods in ASTM C76/C76M. Class III minimum.

2) Elliptical Pipe: ASTM C507/C507M. Provide required Class based on design information and methods in ASTM C76/C76M.

3) Joints:

a) ASTM C990/C990M butyl gaskets;

b) ASTM C 443/C 443M rubber O-ring joints; or

c) AASHTO M 198, Type B preformed plastic gaskets.

d. Corrugated Aluminum Pipe

1) Piping: ASTM B745/B745M.

2) Joints: Coupling bands conforming to ASTM B745/B745M.

3) Coating: Fully bituminous coated for all applications in accordance with ASTM A849. For applications where piping is part of a piped storm sewer system (not a culvert), provide pipe fully bituminous coated, invert (half) paved with concrete lining in accordance with ASTM A849.

e. Corrugated Steel Pipe

1) Piping: ASTM A760/A760M.

2) Joints: Coupling bands conforming to ASTM A760/A760M.

3) Coating: Fully bituminous coated for all applications in accordance with ASTM A849. For applications where piping is part of a piped storm sewer system (not a culvert), provide pipe fully bituminous coated, invert (half) paved with concrete lining in accordance with ASTM A849.

f. Polyetheylene (PE) Pipe

1) Piping 12" to 60" and Fittings: ASTM 2648/F2648M and AASHTO M 294 Type S, corrugated.

2) Joints: ASTM F477 and ASTM D3212

g. Dual and Triple Wall Polypropylene (PP) Pipe

1) Piping 12" to 60" and Fittings: ASTM F2736, ASTM F2764/F2764M, ASTM F2881 and AASHTO M 330 Type S or D

2) Joints: ASTM F477 and ASTM D3212

h. Perforated PVC Pipe: ASTM D 2729.

i. Perforated PE Pipe

1) Piping and Fittings: AASHTO M 294, Type SP, corrugated.

2) Joints: AASHTO M 294, Soiltight.

G303001 1.1.2 Installation

Install piping in accordance with manufacturer's recommendations and the following standards:

1. PVC, PE and Dual and Triple Wall PP: ASTM D 2321. Do not use ASTM D 2321 Class IV or V materials for bedding, haunching or initial backfill materials.
2. Ductile Iron: AWWA C600.
3. Reinforced Concrete: ACPA 01-102 and 01-103.
4. Corrugated Aluminum: ASTM B 788/B 788M.
5. Corrugated Steel: ASTM A 798/A 798M.
6. Perforated PVC and Perforated PE: ASTM D 2321. Do not use ASTM D 2321 Class IV or V materials for bedding, haunching or initial backfill materials.

Provide nondetectable warning tape and a continuous length of tracer wire for the full length of each run of nonmetallic piping below grade. Warning tape to be color coded with warning and identification of utility type imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION,

BURIED (utility type) LINE BELOW" or similar wording. Color to be green for sewer systems. Terminate tracer wire above grade at valve boxes and at exterior of building.

G303001 1.2 PIPING FOR CLEANOUTS

G303001 1.2.1 Materials

a. Cast-Iron Soil Pipe for Cleanouts

1) Pipe: ASTM A 74, service.

2) Joints: ASTM C 564 compression-type rubber gaskets.

3) Exterior Protection (if required): AWWA C105, polyethylene encasement.

G303001 1.2.2 Installation

Install cast iron pipe and fittings in accordance with the recommendations of the pipe manufacturer.

G303002 STORM SEWER STRUCTURES

G303002 1.1 GENERAL REQUIREMENTS

Provide all materials, equipment, labor, testing, and miscellaneous related items for the drainage structures in accordance with the following:

a. Set structure rim elevations flush with finished surface of paved areas or 1 inch (25 mm) above finished grade in unpaved areas.
b. Provide resilient connectors for making joints between manhole and pipes entering manhole in conformance with ASTM C 923/C 923M.
c. Provide precast or cast-in-place concrete drainage structures, except cast-in-place concrete is required for airfield drainage structures, headwalls and gutters.

G303002 1.2 PRECAST CONCRETE INLETS

Provide work and materials in accordance with applicable requirements of the State Highway Specifications (SHS) and standards where the project is located.

G303002 1.3 CAST-IN-PLACE CONCRETE DRAINAGE STRUCTURES

Provide work and materials in accordance with drainage structures indicated in the State Highway Specifications (SHS) and standards where the project is located.

For airfield drainage structures, provide work and materials in accordance with FAA ACA 150/5370-10B.

G303002 1.4 DRAINAGE STRUCTURE FRAMES AND COVERS

Frame and cover for gratings shall be cast gray iron, ASTM A48/A48M, Class 35B; cast ductile iron, ASTM A536, Grade 65-45-12; or cast aluminum, ASTM

B26/B26M, Alloy 356.OT6. Frame and cover must be designed to accommodate the imposed live loads. Stamp or cast the words "Storm Sewer" into covers so that it is plainly visible.

For airfield drainage structures, fabricate frames and covers of standard commercial grade steel welded by qualified welders in accordance with AWS D1.1/D1.1M. Provide covers of rolled steel floor plate having an approved anti-slip surface. Steel frames and covers must be hot dipped galvanized after fabrication. At the contractor's option, ductile iron covers and frames may be used for airfield drainage structures if designed for a minimum proof load of 100,000 pounds (45,000 kg) in lieu of the steel frames and covers. Covers must be of the same material as the frames (i.e. ductile iron frame with ductile iron cover, galvanized steel frame with galvanized steel cover). Perform proof loading in accordance with ASTM A 48/A 48M. Physically stamp proof loads into the cover. Provide the Contracting Officer copies of previous proof load test results performed on the same frames and covers as proposed for this contract. Modify the top of the structure to accept the ductile iron structure in lieu of the steel structure indicated. The finished structure must be level and non-rocking, with the top flush with the surrounding pavement.

G303002 1.5 DRAINAGE STRUCTURE STEPS

a. Zinc-coated steel: 29 CFR 1910.27.
b. Plastic or rubber coating pressure molded to steel: ASTM D 4101, copolymer polypropylene; or ASTM C 443/C 443M, except shore A durometer hardness shall be 70 plus or minus 5.

Aluminum steps or rungs will not be permitted.

Steps are not required in structures less than 4 feet (1.2 m) deep.

G303002 1.6 DRAINAGE STRUCTURE CONSTRUCTION

Where a new structure is constructed on an existing line, remove existing pipe as necessary to construct the structure. Cut existing pipe so that pipe ends are approximately flush with the interior face of structure wall, but not protruding into the structure.

G303002 1.7 CONNECTIONS TO EXISTING STRUCTURES

Center pipe connections to existing structures on the structure. Holes for the new pipe must be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe. Cut the structure in a manner that will cause the least damage to the walls.

G303002 1.8 CLEANOUTS

Construct cleanouts of cast iron soil pipe and fittings; see G303001, paragraph 1.2.

G303003 LIFT STATIONS

A stormwater pump station(s) will not be allowed.

G303004 CULVERTS

Culverts 12 inches (300 mm) and larger in diameter shall be reinforced concrete or corrugated steel; PVC, corrugated aluminum, polyethylene and polypropylene pipe may only be used when written approval is received by the Government's Civil Reviewer or indicated in another part of the RFP. See G303001, paragraphs 1.1.1 and 1.1.2 for material and installation requirements.

Flared end sections must be the same material as pipe material.

Provide erosion control in accordance with the State Erosion and Sedimentation Control Standards or EPA guidance where State Standards are unavailable.

G303005 HEADWALLS

Provide cast-in-place concrete headwalls in accordance with the State Highway Specification (SHS) and standards where the project is located.

G303006 EROSION & SEDIMENT CONTROL MEASURES

Refer to Section G103011.

G303007 STORMWATER MANAGEMENT

G303007 1.1 STORMWATER COLLECTION AND STORAGE

Provide permanent stormwater management (i.e., detention and retention ponds, LID and other drainage features) to control stormwater runoff in accordance with UFC 3-201-01, *Civil Engineering*, UFC 3-210-10, *Low Impact Development*, FC 1-300-09N Navy and Marine Corps Design Procedures, State and local stormwater management Laws and Regulations and applicable project sustainability goals. Integrate permanent stormwater management features into the site design in accordance with UFC 3-201-01, *Civil Engineering*.

Parking areas, roads, walks, courtyards, training areas and similar site features may not be used to detain or retain stormwater. Manage stormwater within detention or retention ponds and the LID features indicated in Part 3 of this RFP. Prevent upstream and downstream property damage.

G303090 OTHER STORM SEWER

G303090 1.1 OIL/WATER SEPARATOR

Provide an oil/water separator to remove free oil from oil-in-water mixtures originating from proposed facility operations. Provide grit protection upstream of the oil/water separator.

Provide an oil/water separator utilizing coalescing media and conforming to the applicable guidelines of the American Petroleum Institute (API).

Provide materials or a coating system which will protect the separator from the oil-in-water mixture, atmosphere, and in-situ soil conditions.

Use a separator with a completely removable cover.

G3040 HEATING DISTRIBUTION

G304001 OVERHEAD HOT WATER SYSTEMS

G304001 1.1 PIPING & FITTINGS

Hot water piping shall be ASTM A 53, Type E (electric-resistance welded), Grade A or B), or Type S (seamless, Grade A or B); black steel, Weight Class XS (Extra Strong). ASTM A 106, Grade A or B, black steel, Schedule 80 may be used.

G304001 1.2 INSULATION

Mineral fiber, calcium silicate, or cellular glass pipe insulation with aluminum jacket which matches existing or surrounding insulation. Paint jacket to suit Base Architectural Plan. The minimum insulation thickness shall be in accordance with the following table:

Table 1 Insulation Thickness for Hot Water Systems

Nominal Pipe Diameterinches (mm)	Mineral Fiberinches (mm)	Calcium Silicateinches (mm)	Cellular Glassinches (mm)
1.00 (25)	1.5 (38)	1.5 (38)	1.5 (38)
1.5 (38)	1.5 (38)	1.5 (38)	1.5 (38)
2.0 (51)	1.5 (38)	1.5 (38)	1.5 (38)
2.5 (64)	1.5 (38)	1.5 (38)	1.5 (38)
3.0 (76)	1.5 (38)	1.5 (38)	1.5 (38)
4.0 (100)	2.0 (51)	2.5 (64)	1.5 (38)
5.0 (125)	2.0 (51)	2.5 (64)	1.5 (38)
6.0 (150)	2.5 (64)	2.5 (64)	1.5 (38)
8.0 (200)	2.5 (64)	2.5 (64)	1.5 (38)
10.0 (250)	2.5 (64)	2.5 (64)	1.5 (38)
12.0 (300)	2.5 (64)	2.5 (64)	1.5 (38)
14.0 (350)	2.5 (64)	2.5 (64)	1.5 (38)
16.0 (400)	2.5 (64)	2.5 (64)	1.5 (38)
18.0 (450)	2.5 (64)	2.5 (64)	1.5 (38)

G304001 1.3 EXPANSION

Compensate for piping expansion by utilizing expansion loops and joints. Provide guided slip or flexible ball type expansion joints.

G304001 1.4 SUPPORTS

MSS SP-58 and MSS SP-69, adjustable supports with insulation protection saddles. Provide stainless steel axles for rollers. Provide support poles with guy wires and hardware.

G304002 OVERHEAD STEAM SYSTEMS

G304002 1.1 PIPING & FITTINGS

G304002 1.1.1 Steam Piping

Steam piping shall be ASTM A 53, Type E (electric-resistance welded, Grade A or B) or Type S (seamless, Grade A or B), black steel. Provide Weight Class STD (Standard) for welding end connections. Provide Weight Class XS (Extra Strong) for threaded end connections. ASTM A 106, Grade A or B, black steel, Schedule 40 may be used for pipe sizes through 9 inches (250 mm), and minimum pipe wall thickness of 0.35 inches (9.5 mm) for pipe sizes 12 inches (300 mm) and larger for welding end connections. Provide Schedule 80 for threaded end connections.

G304002 1.1.2 Condensate Piping

Condensate piping shall be ASTM A 53, Type E (electric-resistance welded), Grade A or B), or Type S (seamless, Grade A or B); black steel, Weight Class XS (Extra Strong). ASTM A 106, Grade A or B, black steel, Schedule 80 may be used.

G304002 1.2 INSULATION

Fibrous glass, calcium silicate, or cellular glass pipe insulation with aluminum jacket which matches existing or surrounding insulation. Paint jacket to suit Base Architectural Plan. The minimum insulation thickness shall be in accordance with the following tables:

Table 1 Insulation Thickness for Steam Systems

Nominal Pipe Diameterinches (mm)	Fibrous Glassinches (mm)	Calcium Silicateinches (mm)	Cellular Glassinches (mm)
1.00 (25)	3.5 (90)	4.0 (100)	*
1.5 (38)	3.5 (90)	4.0 (100)	*
2.0 (51)	3.5 (90)	4.0 (100)	*
2.5 (64)	3.5 (90)	4.0 (100)	*
3.0 (76)	4.0 (100)	4.5 (115)	*
4.0 (100)	4.0 (100)	4.5 (115)	*

5.0 (125)	4.5 (115)	5.0 (125)	*
6.0 (150)	4.5 (115)	5.0 (125)	*
8.0 (200)	5.0 (125)	6.0 (150)	*
10.0 (250)	5.0 (125)	6.0 (150)	*
12.0 (300)	5.0 (125)	6.0 (150)	*
14.0 (350)	5.0 (125)	6.0 (150)	*
16.0 (400)	5.0 (125)	6.0 (150)	*
18.0 (450)	5.0 (125)	6.0 (150)	*

* Cellular glass pipe insulation having an insulating efficiency not less than that of the specified thickness of calcium silicate may be provided.

Table 2 Insulation Thickness for Condensate Systems

Nominal Pipe Diameterinches (mm)	Mineral Fiberinches (mm)	Fibrous Glassinches (mm)
1.00 (25)	2.5 (64)	*
1.5 (38)	2.5 (64)	*
2.0 (51)	2.5 (64)	*
2.5 (64)	2.5 (64)	*
3.0 (76)	3.0 (76)	*
4.0 (100)	3.0 (76)	*
5.0 (125)	3.5 (90)	*
6.0 (150)	3.5 (90)	*
8.0 (200)	3.5 (90)	*
10.0 (250)	3.5 (90)	*
12.0 (300)	3.5 (90)	*
14.0 (350)	3.5 (90)	*
16.0 (400)	3.5 (90)	*

18.0 (450)	3.5 (90)	*

* Fibrous glass pipe insulation having an insulating efficiency not less than that of the specified thickness of mineral fiber may be provided.

G304002 1.3 EXPANSION

Compensate for piping expansion by utilizing expansion loops and joints. Provide guided slip or flexible ball type expansion joints.

G304002 1.4 SUPPORTS

MSS SP-58 and MSS SP-69, adjustable supports with insulation protection saddles. Provide stainless steel axles for rollers. Provide support poles with guy wires and hardware.

G304003 UNDERGROUND HOT WATER SYSTEMS

G304003 1.1 PIPING & FITTINGS

Direct buried, factory pre-fabricated, pre-insulated, piping systems shall consist of a service pipe with polyurethane insulation and a high-density polyethylene (HDPE) jacket. Provide factory fabricated fittings and components. Field insulation of fittings will not be allowed.

G304003 1.2 INSULATION

The minimum insulation thickness shall be in accordance with the following tables:

Table 1 Insulation Thickness for Drainable/Dryable Systems

Nominal Pipe Diameterinches (mm)	Parocinches (mm)	Epitherminches (mm)	Kaylo-10 Thermo-12 Super Caltempinches (mm)
1.00 (25)	2.0 (51)	2.5 (64)	4.0 (100)
1.5 (38)	2.0 (51)	2.5 (64)	4.0 (100)
2.0 (51)	2.5 (64)	3.5 (90)	4.5 (115)
2.5 (64)	2.5 (64)	3.5 (90)	4.5 (115)
3.0 (76)	3.0 (76)	4.0 (100)	5.0 (125)
4.0 (100)	3.0 (76)	4.0 (100)	5.0 (125)
5.0 (125)	3.0 (76)	4.0 (100)	5.0 (125)
6.0 (150)	3.5 (90)	4.5 (115)	5.5 (140)
8.0 (200)	3.5 (90)	4.5 (115)	5.5 (140)

10.0 (250)	4.0 (100)	5.0 (125)	6.0 (150)
12.0 (300)	4.0 (100)	5.0 (125)	6.0 (150)
14.0 (350)	4.0 (100)	5.0 (125)	6.0 (150)
16.0 (400)	4.0 (100)	5.0 (125)	6.0 (150)
18.0 (450)	4.0 (100)	5.0 (125)	6.0 (150)

Table 2 Insulation Thickness for Water Spread Limiting Systems

Nominal Pipe Diameterinches (mm)	Calcium Silicateinches (mm)	Polyurethaneinches (mm)
1.00 (25)	N/A	N/A
1.5 (38)	N/A	N/A
2.0 (51)	N/A	N/A
2.5 (64)	N/A	N/A
3.0 (76)	1.00 (25)	1.23 (31)
4.0 (100)	1.00 (25)	1.23 (31)
5.0 (125)	N/A	N/A
6.0 (150)	1.5 (38)	1.34 (34)
8.0 (200)	2.0 (51)	1.21 (30)
10.0 (250)	2.5 (64)	1.31 (33)
12.0 (300)	2.0 (51)	1.29 (33)
14.0 (350)	N/A	N/A
16.0 (400)	N/A	N/A
18.0 (450)	N/A	N/A

G304003 1.3 UHDS DESIGN

Design and provide direct buried, factory-prefabricated, pre-insulated main hot water piping, including piping in manholes. Asbestos cement or plastic conduit is not acceptable. The UHDS representative shall be certified in writing by the UHDS manufacturer to be technically qualified and experienced

in the installation of the system. Provide a Certificate of Satisfactory Operation certifying that at least 3 systems installed by the UHDS manufacturer within the previous 10 years have and are operating satisfactorily for not less than 5 years. The certificate shall include verification information.

G304003 1.4 VALVING

Provide isolation valves on supply and return lines at take-offs for service to each building. Valves shall be located in valve boxes. Valves shall be ASME class 150.

G304003 1.5 EXPANSION

Compensate for piping expansion by utilizing expansion loops.

G304004 UNDERGROUND STEAM DISTRIBUTION SYSTEMS

G304004 1.1 PIPING & FITTINGS

Direct buried, factory pre-fabricated, pre-insulated, steam and condensate piping systems shall consist of a steel service pipe with polyurethane insulation and a high-density polyethylene (HDPE) jacket. Provide factory fabricated fittings and components. Field insulation of fittings will not be allowed.

G304004 1.2 INSULATION

The minimum insulation thickness shall be in accordance with the following tables:

Table 1 Insulation Thickness for Drainable/Dryable Systems

Nominal Pipe Diameterinches (mm)	Parocinches (mm)	Epitherminches (mm)	Kaylo-10 Thermo-12 Super Caltempinches (mm)
1.00 (25)	2.0 (51)	2.5 (64)	4.0 (100)
1.5 (38)	2.0 (51)	2.5 (64)	4.0 (100)
2.0 (51)	2.5 (64)	3.5 (90)	4.5 (115)
2.5 (64)	2.5 (64)	3.5 (90)	4.5 (115)
3.0 (76)	3.0 (76)	4.0 (100)	5.0 (125)
4.0 (100)	3.0 (76)	4.0 (100)	5.0 (125)
5.0 (125)	3.0 (76)	4.0 (100)	5.0 (125)
6.0 (150)	3.5 (90)	4.5 (115)	5.5 (140)
8.0 (200)	3.5 (90)	4.5 (115)	5.5 (140)

10.0 (250)	4.0 (100)	5.0 (125)	6.0 (150)
12.0 (300)	4.0 (100)	5.0 (125)	6.0 (150)
14.0 (350)	4.0 (100)	5.0 (125)	6.0 (150)
16.0 (400)	4.0 (100)	5.0 (125)	6.0 (150)
18.0 (450)	4.0 (100)	5.0 (125)	6.0 (150)

Table 2 Insulation Thickness for Water Spread Limiting Systems

Nominal Pipe Diameterinches (mm)	Calcium Silicateinches (mm)	Polyurethaneinches (mm)
1.00 (25)	N/A	N/A
1.5 (38)	N/A	N/A
2.0 (51)	N/A	N/A
2.5 (64)	N/A	N/A
3.0 (76)	1.00 (25)	1.23 (31)
4.0 (100)	1.00 (25)	1.23 (31)
5.0 (125)	N/A	N/A
6.0 (150)	1.5 (38)	1.34 (34)
8.0 (200)	2.0 (51)	1.21 (30)
10.0 (250)	2.5 (64)	1.31 (33)
12.0 (300)	2.0 (51)	1.29 (33)
14.0 (350)	N/A	N/A
16.0 (400)	N/A	N/A
18.0 (450)	N/A	N/A

Table 3 Insulation Thickness for Condensate Return Systems

Nominal Pipe Diameterinches (mm)	Parocinches (mm)	Epitherminches (mm)	Kaylo-10 Thermo-12 Super Caltempinches (mm)
1.00 (25)	2.0 (51)	2.5 (64)	4.0 (100)

1.5 (38)	2.0 (51)	2.5 (64)	4.0 (100)
2.0 (51)	2.5 (64)	3.5 (90)	4.5 (115)
2.5 (64)	2.5 (64)	3.5 (90)	4.5 (115)
3.0 (76)	3.0 (76)	4.0 (100)	5.0 (125)
4.0 (100)	3.0 (76)	4.0 (100)	5.0 (125)
5.0 (125)	3.0 (76)	4.0 (100)	5.0 (125)
6.0 (150)	3.5 (90)	4.5 (115)	5.5 (140)
8.0 (200)	3.5 (90)	4.5 (115)	5.5 (140)
10.0 (250)	4.0 (100)	5.0 (125)	6.0 (150)
12.0 (300)	4.0 (100)	5.0 (125)	6.0 (150)
14.0 (350)	4.0 (100)	5.0 (125)	6.0 (150)
16.0 (400)	4.0 (100)	5.0 (125)	6.0 (150)
18.0 (450)	4.0 (100)	5.0 (125)	6.0 (150)

G304004 1.3 UHDS DESIGN

Design and provide direct buried, factory-prefabricated, pre-insulated main steam and condensate piping in separate conduits and including piping in manholes. Asbestos cement or plastic conduit is not acceptable. The UHDS representative shall be certified in writing by the UHDS manufacturer to be technically qualified and experienced in the installation of the system. Provide a Certificate of Satisfactory Operation certifying that at least 3 systems installed by the UHDS manufacturer within the previous 10 years have and are operating satisfactorily for not less than 5 years. The certificate shall include verification information.

G304004 1.4 VALVING

Provide isolation valves on supply and return lines at take-offs for service to each building. Valves shall be located in manholes. Valves shall be ASME class 150.

G304004 1.5 EXPANSION

Compensate for piping expansion by utilizing expansion loops. Locate anchors outside manholes.

G304005 REINFORCED CONCRETE MANHOLES & VALVE BOXES

G304005 1.1 MANHOLE CONSTRUCTION

Manholes shall be shall be constructed of reinforced, 3000 psi (206.8 bar) concrete and shall extend a minimum of 6 inches (300 mm) above grade. Depth shall be as required to maintain proper pipe slopes. Construct manhole floor and sides in one monolithic pour. Provide galvanized steel or sectioned aluminum, open grate or solid cover as indicated in ESR Section G30. Provide ventilation openings for solid cover. Provide ladder. Ladder shall be steel with non-slip surfaces and anchored to the wall. Manhole floor and walls shall be watertight. Provide sleeves or core drill openings for pipes with modular mechanical seals. Provide sump pit for pump.

G304005 1.2 VALVE BOX CONSTRUCTION

Cast-iron or ductile-iron box of a suitable size. Provide cast-iron or ductile-iron cover for the box with word(s) describing the utility cast on the cover.

G304005 1.3 MANHOLE SUMP PUMPS

Vertical sump pump. Operating temperature design must be 195 degrees F (93 degrees C) minimum. Provide with 2-pole float control.

G304090 OTHER HEATING DISTRIBUTION

G304090 1.1 WARNING & IDENTIFICATION TAPE

Polyethylene plastic tape manufactured specifically for warning and identifying buried utility lines. Warning tape to be color coded with warning and identification of utility type imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (utility type) LINE BELOW"or similar wording. Color to be white for steam systems.

G304090 1.2 CORROSION PROTECTION

Provide a cathodic protection system for the underground piping system. System shall be designed by a National Association of Corrosion Engineers (NACE) certified Cathodic Protection Engineer. The corrosion engineer shall obtain soil data and existing system conditions. Corrosion engineer shall supervise, inspect and test the installation and performance of the cathodic protection system. Test stations shall be post mounted and placed at the manhole or nearby building. Test stations shall be located at each end of each cathodically protected section.

G3050 COOLING DISTRIBUTION

G305001 OVERHEAD COOLING SYSTEMS

G305001 1.1 PIPING & FITTINGS

G305001 1.1.1 Chilled and Condenser Water Piping

Chilled and condenser water piping shall be electric resistance welded or seamless Schedule 40 black steel pipe conforming to ASTM A 53. Piping 4 inch (100 mm) and smaller may be ASTM B 88 Type K or L copper.

G305001 1.1.2 Steel Pipe Fittings

For piping 2 inch (50 mm) and smaller, provide ANSI/ASME B16.3 malleable iron screwed fittings or ASME B16.11 socket welding (Class 3000) or threaded type (Class 2000). Provide ASME/ANSI B16.9 butt-welding fittings or ASME/ANSI B16.5 flanged type for piping 2-1/2 inch (63 mm) and larger. Grooved joint pipe coupling systems of appropriate pressure rating are acceptable in lieu of welded or screwed fittings.

G305001 1.1.3 Copper Fittings

Provide ANSI B16.18 cast bronze solder joint type or ASME/ANSI B16.22 wrought copper solder joint type.

G305001 1.2 INSULATION

Mineral fiber, Urethane, cellular glass, Faced Phenolic Foam, or Flexible Cellular pipe insulation with aluminum jacket in accordance with ESR Section G30. The minimum insulation thickness shall be in accordance with the following table:

Table 1 Insulation Thickness for Cold Water Systems

Nominal Pipe Diameterinches (mm)	Mineral Fiberinches (mm)	Urethaneinches (mm)	Cellular Glassinches (mm)	Faced Phenolic Foaminches (mm)	Flexible Cellularinches (mm)
1.00 (25)	1.00 (25)	0.75 (19)	1.5 (38)	1.00 (25)	0.75 (19)
1.5 (38)	1.00 (25)	0.75 (19)	1.5 (38)	1.00 (25)	0.75 (19)
2.0 (51)	1.00 (25)	0.75 (19)	1.5 (38)	1.00 (25)	0.75 (19)
2.5 (64)	1.00 (25)	0.75 (19)	1.5 (38)	1.00 (25)	0.75 (19)
3.0 (76)	1.00 (25)	0.75 (19)	1.5 (38)	1.00 (25)	0.75 (19)
4.0 (100)	1.5 (38)	0.75 (19)	1.5 (38)	1.00 (25)	0.75 (19)
5.0 (125)	1.5 (38)	0.75 (19)	1.5 (38)	1.00 (25)	0.75 (19)
6.0 (150)	1.5 (38)	1.00 (25)	1.5 (38)	1.5 (38)	1.00 (25)
8.0 (200)	1.5 (38)	1.00 (25)	1.5 (38)	1.5 (38)	1.00 (25)
10.0 (250)	1.5 (38)	1.00 (25)	1.5 (38)	1.5 (38)	1.00 (25)
12.0 (300)	1.5 (38)	1.00 (25)	1.5 (38)	1.5 (38)	1.00 (25)
14.0 (350)	1.5 (38)	1.00 (25)	1.5 (38)	1.5 (38)	1.00 (25)
16.0 (400)	1.5 (38)	1.00 (25)	1.5 (38)	1.5 (38)	1.00 (25)

18.0 (450)	1.5 (38)	1.00 (25)	1.5 (38)	1.5 (38)	1.00 (25)

G305001 1.3 SUPPORTS

Provide MSS SP-58 and MSS SP-69, adjustable supports with insulation protection saddles. Provide stainless steel axles for rollers. Provide support poles with guy wires and hardware.

G305001 1.4 EXPANSION

Compensate for piping expansion by utilizing expansion loops and joints. Provide guided slip or flexible ball type expansion joints.

G305002 UNDERGROUND COOLING SYSTEMS

G305002 1.1 PIPING & FITTINGS

Direct buried, factory-prefabricated, pre-insulated, chilled water piping systems. All fittings and accessories shall be designed and factory-fabricated to prevent moisture from entering into the system. Backfill and overall installation shall meet the requirements of the piping system manufacturer.

G305002 1.2 VALVES

Provide isolation valves on supply and return lines at take-offs for service to each building. Valves shall be located in valve boxes.

G305090 OTHER COOLING DISTRIBUTION

G305090 1.1 EXPANSION

Compensate for piping expansion by utilizing expansion loops. Locate anchors outside manholes.

G305090 1.2 WARNING & IDENTIFICATION TAPE

Polyethylene plastic tape manufactured specifically for warning and identifying buried utility lines. Warning tape to be color coded with warning and identification of utility type imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (utility type) LINE BELOW" or similar wording.

G305090 1.3 CORROSION PROTECTION

Provide a cathodic protection system for the underground chilled water and condenser water piping system. System shall be designed by a National Association of Corrosion Engineers (NACE) certified Cathodic Protection Engineer. The corrosion engineer shall obtain soil data and existing system conditions. Corrosion engineer shall supervise, inspect and test the installation and performance of the cathodic protection system. Test stations shall be post mounted and placed at the manhole or nearby building. Test stations shall be located at each end of each cathodically protected section.

G3060 FUEL DISTRIBUTION

G306001 LIQUID FUEL DISTRIBUTION PIPING

G306001 1.1 GASOLINE/DIESEL

Fuel piping shall be ASTM A 53, Type E (electric-resistance welded, Grade A or B) or Type S (seamless, Grade A or B), black steel or API SPEC 5L, seamless, submerged-arc weld or gas metal-arc weld, Grade B, black steel. Provide Weight Class STD (Standard) for welding end connections. Provide Weight Class XS (Extra Strong) for threaded end connections.

For underground fuel distribution lines, provide nondetectable warning tape for the full length of each run of piping. Warning tape to be color coded with warning and identification of utility type imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (utility type) LINE BELOW" or similar wording. Color to be yellow for fuel lines.

G306003 LIQUID FUEL STORAGE TANKS

G306003 1.1 STORAGE TANKS

Aboveground, concrete encased or double wall in accordance with UL 142 and UL 2085 with secondary containment and leak monitoring with a capacity to meet the system requirements. Provide with overfill/spill containment, overfill protection and vents.

G306003 1.2 FUEL PUMPS

Fuel pumps shall comply with NEMA MG 1, NFPA 70, and be designed for use with hydrocarbon fuels and working pressure of 275 psig (1896 kilopascals) at 100 degrees F (38 degrees C).

G306003 1.3 FUEL METERS

Continuous duty, positive displacement type, with electronic thermal compensation capability, suitable for outdoor installation, and designed for use with hydrocarbon fuels and working pressure of 275 psig (1896 kilopascals) at 100 degrees F (38 degrees C).

G306004 LIQUID FUEL DISPENSING TANKS

The same as storage tanks except, include tank mounted dispenser with filter, vacuum breaker, safety breakaway, hose and nozzle.

G306006 GAS DISTRIBUTION PIPING (NATURAL & PROPANE)

G306006 1.1 STEEL PIPE

Gas piping shall be ASTM A 53, Type E (electric-resistance welded, Grade A or B) or Type S (seamless, Grade A or B), black steel. Provide Weight Class STD (Standard) for welding end connections. Provide Weight Class XS (Extra Strong) for threaded end connections.

G306006 1.2 POLYETHYLENE (PE)

PE pipe and heat fusion fittings shall conform to ASTM D 2513, Grade PE2406 or PE3408.

G306007 GAS STORAGE TANKS

G306007 1.1 PROPANE STORAGE TANKS

ASME labeled tank in accordance with NFPA 58 with a capacity to meet the system requirements.

G306009 OTHER GAS DISTRIBUTION

G306009 1.1 WARNING & IDENTIFICATION TAPE

Detectable aluminum foil, plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identifying buried piping. Warning tape to be color coded with warning and identification of utility type imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (utility type) LINE BELOW" or similar wording. Color to be yellow for gas lines.

-- End of Section --

SECTION G40

SITE ELECTRICAL UTILITIES
09/15

G40 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

G40 1.1 NARRATIVE

This section covers installations exterior to the facility outside the five foot line. See PTS Section D50, *Electrical*, for continuation of systems inside the five foot line, into and inside the building.

G40 1.2 ELECTRICAL DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

When all product Quality Control information is included in the Unified Facility Criteria (UFC) and there are requirement options identified in the ESR, then the Uniformat Level 4 titles (and possible subtitles) are included without repetition of requirements. One example of this is G401008, GROUNDING SYSTEMS.

G40 1.2.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed in UFGS Section 01 33 10.05 20, which includes the following significant UFC(s):UFC 3-501-01, Electrical Engineering)
UFC 1-200-02	High Performance and Sustainable Buildings
UFC 3-570-02N	Electrical Engineering Cathodic Protection

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 26 11 13.00 20	Primary Unit Substation
UFGS 26 11 16	Secondary Unit Substations
UFGS 26 12 19.10	Three-Phase Pad-Mounted Transformers
UFGS 26 12 19.20	Single-Phase Pad-Mounted Transformers
UFGS 26 13 00.00 20	SF6/High-Firepoint Fluids Insulated Pad-Mounted Switchgear
UFGS 26 23 00	Low Voltage Switchgear
UFGS 26 24 13	Switchboards
UFGS 26 27 14.00 20	Electricity Metering
UFGS 26 56 00	Exterior Lighting
UFGS 33 71 01	Overhead Transmission and Distribution
UFGS 33 71 02	Underground Electrical Distribution
UFGS 33 82 00	Telecommunications Outside Plant

G40 1.3 QUALITY ASSURANCE

Qualifications, certifications, and Test Plans indicated herein shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

The Designer of Record is responsible for approving the submittals listed below.

G40 1.3.1 Qualified Testing Organization

Contractor shall engage the services of a qualified testing organization to provide inspection, testing, calibration, and adjustment of the electrical distribution system and equipment listed in paragraph entitled "Acceptance Tests and Inspections" herein. Organization shall be independent of the supplier, manufacturer, and installer of the equipment. The organization shall be a first tier subcontractor.

a. Submit name and qualifications of organization. Organization

shall have been regularly engaged in the testing of electrical materials, devices, installations, and systems for a minimum of 5 years. The organization shall have a calibration program, and test instruments used shall be calibrated in accordance with NETA ATS.

b. Submit name and qualifications of the lead engineering technician performing the required testing services. Include a list of three comparable jobs performed by the technician with specific names and telephone numbers for reference. Testing, inspection, calibration, and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute for Certification in Engineering Technologies (NICET) with a minimum of 5 years' experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

G40 1.3.2 NEC Qualified Worker

Provide in accordance with NFPA 70. Qualified Workers shall be allowed to be assisted by helpers on a 1 to 1 ratio, provided such helpers are registered in recognized apprenticeship programs. Submit a certification confirming NEC Qualified Worker requirements.

G40 1.3.3 Qualified Medium Voltage Electrician

All workers on medium voltage electrical crews shall have 5 years experience working medium voltage systems on similar projects involving the same or higher voltage.

G40 1.3.4 Qualified Cable Splicer (Medium Voltage Cable)

The cable splicer/terminator must have a certification from the National Cable Splicing Certification Board (NCSCB) in the field of splicing and terminating shielded medium voltage (5 kV to 35 kV) power cable using pre-manufactured kits (pre-molded, heat-shrink, cold-shrink). Proof of certification for the individuals that will be performing cable splicer and termination work shall be submitted 30 days before splices or terminations are to be made.

G40 1.3.5 Qualified PV Installer

Installation of photovoltaic systems shall be by experienced and trained installers. At minimum the PV installation supervisor shall hold a "PV Installer Certification" as issued by the North American Board of Certified Energy Practitioners or hold a Certified Solar Roofing Professional (CSRP) credential issued by RISE "Roof Intergrated Solar Energy Inc".

G40 1.3.6 Qualified Cable Splicer (Telecommunications)

Certification shall include the training, and experience of the individual on specific type and classification of telecommunications cable to be provided under this contract.

G40 1.3.7 Qualified Cable Installer and Splicer (Fiber Optic Cable)

Certification shall include the training, and experience of the individual on specific type and classification of Fiber Optic media to be provided under this contract.

G40 1.3.8 Qualified Fiber Optic (FO) Cable Manufacturer

The FO media manufacturer shall have a minimum of 3 years experience in the manufacturing, assembly, and factory testing of FO media that complies with RUS REA Bull 1753F-601 (PE-90). Manufacturer shall provide a list of customers with 3 years of maintenance logs documenting experience with government customers.

G40 1.3.9 Material Standards

Ensure service support and provide manufacturer's nameplate in accordance with PTS Section Z10, *General Performance Technical Specification*.

G40 1.3.9.1 Warning Labels

Each enclosure of electrical equipment, including substations, pad-mounted transformers, pad-mounted switches, pad-mounted sectionalizing termination cabinets, and switchgear, shall have a warning label identifying the enclosure as 1) containing energized electrical equipment and 2) an arc flash hazard.

G40 1.3.10 Factory Testing

The Government reserves the right to witness all factory testing. The manufacturer shall have a calibration program that assures that all applicable test instruments are maintained within rated accuracy.

G40 1.3.11 Electrical System Startup and Testing

Submit test plans for approval. The test plans shall be tailored to the systems provided.

The test plan shall list make and model and provide functional description of the test instruments and accessories and shall describe the setup of the tests to be conducted. Test instruments shall be capable of measuring and recording or displaying test data at a higher resolution and greater accuracy than specified for the equipment's performance.

G40 1.3.11.1 Factory Trained Engineer

Provide a factory trained engineer to supervise start-up and testing as required in referenced specifications.

G40 1.3.11.2 Performance Verification Testing

The Contractor shall show by demonstration in service that all circuits and devices are in operating condition. Tests shall be such that each item of control equipment will function not less than five times. The Contractor shall provide all necessary test equipment, tools, fuel, load banks, labor, and materials

for testing. As a minimum, all systems shall be tested in accordance with manufacturer's recommendations. Additional testing requirements for the various systems are described with those systems, hereinafter. The Contractor shall assure that all applicable test instruments are maintained within rated accuracy. Dated calibration labels shall be visible on all test equipment.

Submit a separate electrical field test plan in accordance with manufacturer's recommendations and that conforms to NETA ATS for each piece of Electrical Distribution Equipment and System requiring Performance Verification Testing.

The following items identify specific test requirements. Additional test requirements are contained in the applicable UFGS.

a. Cable – Test cable in accordance with the manufacturer's recommendations and NETA ATS. Adhere to precautions and limits as specified in the applicable NEMA/ICEA Standard for the specific cable.
b. Grounding - Test ground systems in accordance with the manufacturer's recommendations and NETA ATS.
c. Site Lighting - Contractor's Quality Control (CQC) representative shall perform a field survey of site lighting systems in accordance with IESNA for acceptance. Show that the lighting system operates in accordance with the user’s requirements and is in accordance with designed levels. Provide certification that the measured lighting levels conform to the design requirements.
d. Telecommunications wiring - Test all cables in accordance with industry standards.

G40 1.3.11.3 Acceptance Tests and Inspections

The Qualified Testing Organization shall provide the Acceptance Tests and Inspections test plan and procedures and perform the acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with NETA ATS, the manufacturer's recommendations, and paragraph entitled "Field Quality Control" of each applicable specification section. Tests identified as optional in NETA ATS are not required unless otherwise specified. Equipment shall be placed in service only after completion of required tests and evaluation of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing.

Specific test requirements are contained in the UFGS for equipment.

G40 1.4 DESIGN SUBMITTALS

Design Submittals shall be in accordance with PTS Section Z10, *General*

Performance Technical Specifications, UFGS Section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, and UFC 3-501-01, *Electrical Engineering*.

In addition, UFGS sections listed below or in the body of the PTS text are to be used by the Designer of Record (DOR) as a part of the design submittal. If the UFGS products or systems are applicable to the project, the DOR shall edit these referenced UFGS sections and submit them as a part of the design submittal specification. Edit the specification sections in accordance with the limitations stated in PTS Section Z10, *General Performance Technical Specifications*.

UFGS 26 11 13.00 20, *Primary Unit Substation*

UFGS 26 11 16, *Secondary Unit Substations*

UFGS 26 12 19.10, *Three-Phase Pad-Mounted Transformers*

UFGS 26 12 21, *Single-Phase Pad-Mounted Transformers*

UFGS 26 13 00.00 20, *SF6/High-Firepoint Fluids Insulated Pad-Mounted Switch Gear*

UFGS 26 23 00, *Low Voltage Switchgear*

UFGS 26 24 13, *Switchboards*

UFGS 26 27 14.00 20, *Electricity Metering*

UFGS 33 71 01, *Overhead Transmission and Distribution*

UFGS 33 71 02, *Underground Electrical Distribution*

UFGS 33 82 00, *Telecommunications Outside Plant*

G40 1.4.1 Sustainable Design Submittal

Submit sustainable design submittals in accordance with UFGS 01 33 29.05 20, *Sustainability Reporting for Design-Build*.

G40 1.5 CONSTRUCTION SUBMITTALS

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the PTS Section Z10 requirements, the Designer of Record (DOR) shall approve the following construction submittals as a minimum:

OMSI Information for Electrical Equipment (if OMSI Manual for the entire project is not already required); all "G" item submittals listed in the submittals of the specifications sections identified in the Design Submittals paragraph above; and all "G" item submittals listed in Government Surveillance UFGS Section 01 33 00.05 20, *Construction Submittal Procedures*.

Provide certification that all adjustable protective device settings have been set in accordance with the coordination study for the as-built equipment and configuration.

G40 1.5.1 Sustainable Construction Submittal

Submit sustainable construction submittals in accordance with UFGS 01 33 29.05 20, *Sustainability Reporting for Design-Build*.

G4010 ELECTRICAL DISTRIBUTION

G401001 SUBSTATIONS

When secondary unit substations are required, the Designer of Record shall utilize UFGS Section 26 11 16, *Secondary Unit Substation*, and UFGS Section 26 23 00, *Switchboards and Switchgear*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

G401002 TRANSFORMERS

When transformers are required, the Designer of Record shall utilize UFGS Section 26 12 19.10, *Three-Phase Pad Mounted Transformers*, UFGS Section 26 12 19.20, *Single-Phase Pad Mounted Transformers*, or UFGS Section 33 71 01, *Overhead Transmission and Distribution*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

G401003 SWITCHES, CONTROLS AND DEVICES

When switches or control devices are required, the Designer of Record shall utilize UFGS Section 26 13 00.00 20, *SF6/High-Firepoint Fluids Insulated Pad Mounted Switchgear*, or UFGS Section 33 71 01, *Overhead Transmission and Distribution*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

G401004 OVERHEAD ELECTRIC CONDUCTORS

Power line conductors shall be strung in accordance with manufacturer's standard sag and tension recommendations.

G401005 TOWERS, POLES, CROSSARMS AND INSULATORS

Wood poles shall comply with ANSI 05.1 and RUS 1728F-700. Pressure treat poles in accordance with AWPA C1 and AWPA C4 as referenced in RUS 1728F-700. The quality of each pole shall be ensured with "WQC" (wood quality control) brand on each piece or by an approved inspection agency report. Do not use creosote treated poles, lodgepole pine, and western larch pine poles.

Concrete poles shall comply with ANSI loadings for distribution poles.

The size of poles required, class, height and other data, shall be determined by the designer of record to meet requirements of the pole line. Crossarms shall be wood, steel or fiberglass in accordance with industry and local standards. Insulators, cutouts and associated equipment shall be determined by the Designer of Record to meet system requirements.

G401006 UNDERGROUND ELECTRIC CONDUCTORS

Route underground cables to minimize splices. Cable pulling tensions shall not exceed the maximum pulling tension recommended by the cable manufacturer. Medium voltage cable termination shall be suitable for the location installed and meet IEEE Std. 48 Class 1 requirements.

G401007 DUCTBANKS, MANHOLES, HANDHOLES AND RACEWAYS

Concrete manholes and handholes shall be standard type pre-cast concrete. Composite/Fiberglass handholes shall be polymer concrete reinforced with a heavy weave fiberglass reinforcing as indicated. Load ratings of manholes and handholes shall be suitable for the location installed.

G401008 GROUNDING SYSTEMS

G401009 METERING

When metering is required the Designer of Record shall utilize UFGS section 26 27 14.00 20 for the project specification and shall submit the edited specification section as part of the design submittal for the project.

G401010 CATHODIC PROTECTION SYSTEMS

Cathodic protection systems shall be in accordance with UFC 3-570-02N.

G401011 EQUIPMENT REQUIREMENTS FOR COASTAL AND HIGH HUMIDITY AREAS

G4020 SITE LIGHTING

G402001 EXTERIOR LIGHTING FIXTURES AND CONTROLS

Utilize SSL lighting sources for exterior lighting, except where lighting is required to match an existing source.

Comply with ANSI/ASHRAE/IES 90.1 for all exterior lighting applications and controls. Comply with UFC 3-530-01 for reduction of light pollution.

Provide SPD at panelboards that include circuits feeding exterior lighting systems.

Coordinate the design and luminaire selection with the landscape designer. Such coordination should include the location of poles which may conflict with tree locations.

When exterior lighting is required the Designer of Record shall utilize UFGS section 26 56 00 for the project specification and shall submit the edited specification section as part of the design submittal for the project.

G402002 SPECIAL SECURITY LIGHTING SYSTEM

G402003 OTHER AREA LIGHTING

G402004 LIGHTING POLES

Poles shall meet International Building Code for street lighting poles, and AASHTO loadings for highway and sports lighting poles taking into account the effective

projected areas of the luminaries provided. Poles shall be direct set or anchor-base type designed for use with underground supply conductors.

G402005 UNDERGROUND ELECTRIC CONDUCTORS

Provide in accordance with Paragraph G401006.

G402006 DUCTBANKS, MANHOLES AND HANDHOLES

Handholes and underground conduits for site lighting shall be in accordance with Paragraph G401007.

G402007 GROUNDING SYSTEMS

G4030 SITE COMMUNICATION AND SECURITY

G403001 TELECOMMUNICATIONS SYSTEMS

G403002 CABLE TV SYSTEMS (CATV)

G403003 CABLES AND WIRING

Provide underground copper cable pair in accordance with RUS 345-67. Provide aerial cable in accordance with RUS 345-67 except that it shall be suitable for aerial installation and shall be Figure 8 distribution wire with 6,000 pound (26,700 N) Class A galvanized steel or 6,000 pound (26,700 N) aluminum-clad steel strand. Screen-compartmental core cable shall be filled cable meeting the requirements of RUS 345-67. Fiber optic media shall meet all performance requirements of EIA/TIA-568-A and the physical requirements of ICEA S 87-640 and EIA/TIA-598-A.

G403004 DUCTBANKS, MANHOLES AND HANDHOLES

Provide in accordance with paragraph G401007.

G403005 TOWERS, POLES AND STANDS

Provide in accordance with paragraph G401005.

G403006 TV CAMERAS AND MONITORS

G403007 ELECTRONIC SECURITY SYSTEM (ESS)

G403008 OTHER COMMUNICATION AND ALARM

G403009 GROUNDING SYSTEMS

G403010 INDUSTRIAL CONTROL SYSTEMS (ICS)

G4090 OTHER ELECTRICAL UTILITIES

G409007 PHOTOVOLTAIC ENERGY SYSTEM

Provide a grid tied, photovoltaic system, including structural support system, crystalline photovoltaic panels, combiner boxes, and inverters.

Provide all labor, materials, equipment and supervision required to

implement the design and to provide a fully operational system.

Provide crystalline photovoltaic modules with a 20-year limited manufacturer warranty that generates no less than 80% of the rated output under Standard Test Conditions (STC). PV modules shall comply with IEC-61215 and UL-1703.

Provide inverters that comply with UL-1741 and IEEE-1547. Inverters shall operate over an ambient temperature range of -25 degree C to 55 degree C with a minimum efficiency of 95 percent at full load.

Provide start-up and testing utilizing manufacturer certified technician. Submit startup and testing report.

G409007 1.1 CODES AND STANDARDS

The PV system hardware and services shall meet or exceed all applicable local, State and utility requirements, conform to the applicable codes and standards, and have passed the listing and qualification tests, listed below. (Comply with the most recent version of each document).

a. IEEE 1262 "Recommended Practice for Qualification of Photovoltaic Modules".
b. PowerMark certification for PV modules.
c. IEEE Standard 928-1986, Recommended Criteria for Terrestrial Photovoltaic Power Systems (PV system performance criteria).
d. IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems.
e. Underwriters Laboratories 1741-2001 (UL Standard for Inverters and Charge Controllers).
f. Underwriters Laboratories 1703 (UL Standard for Listing Photovoltaic Modules).
g. Certification of PV Equipment: All PV modules, inverters, and electrical components shall be required to be listed or recognized by an appropriate and recognized United States Safety Laboratory (for example: UL or ETL).

G409007 1.2 PHOTOVOLTAIC APPLICATION ANALYSIS

Provide a comprehensive "Photovoltaic Application Analysis" with a detailed description of system, application, site shading conditions and expected kW output of the photovoltaic application. The analysis shall utilize the Solmetric Suneye or the Solar Pathfinder shading analyzers to analyze the effects of the existing site shading conditions. Analysis shall include estimated PV output in kWh per year.

G409007 1.3 TECHNICAL REQUIREMENTS

The contractor work responsibilities include at a minimum: system design, equipment selection, and PV system installations. System shall be individually capable of providing peak power output of at least proposed PV system size, 208 or 480 volt, 3-phase, 4-wire power.

The final System configuration shall allow automatic operation without operator intervention. System design and equipment

specifications shall minimize maintenance requirements. System shall include metering that must be incorporated with current AMI network (Advanced Metering Infrastructure) and planned energy metering projects.

The inverter(s) disconnects and associated electrical equipment must be located in an area that is accessible, weather-protected, and secure from vandalism and personal injury.

Disconnects and over current devices shall be mounted in approved boxes, enclosures, or panel boards. Disconnects and switches shall be DC rated when used in DC applications. Metal enclosures and boxes shall be bonded to the grounding conductor.

At a minimum, electrical meters shall capture the following data on individual system performance (minimum solar irradiance, DC power, AC real power, AC current, AC voltage, and power factor (recommend ION 8600 for AC); ambient air temperature, PV cell temperature, kW, and kWh). This data shall be captured at hourly intervals for a minimum one year. Units of temperature, power, and current shall be in Fahrenheit, Watts, and Amps respectively.

Transformers, if required, shall have a minimum efficiency based on factory test results of not less than the efficiency indicated in 10 CFR 431, Subpart K, paragraph 431.196(b). Transformers shall be housed in a NEMA 4X enclosures.

Mounting structures shall be corrosion resistant to marine environment.

Provide permanent plaque or directory at each building service and power source identifying all other building services and power sources.

-- End of Section --

SECTION H10

WATERFRONT STRUCTURES
09/15

H10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

H10 1.1 NARRATIVE

This Section must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation.

This Section includes the requirements for the design and construction of waterfront structure, described in ESR H10, *Waterfront Structures*, of Part 3 and as identified on the RFP drawings provided in Part 6.

H10 1.2 WATERFRONT STRUCTURE DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*.

H10 1.2.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-220-01, *Geotechnical Engineering*

UFC 3-301-01, *Structural Engineering*

UFC 4-151-10, *General Criteria for Waterfront Construction*

UFC 4-152-01, *Design: Piers And Wharves*

UFC 4-152-07, *Design: Small Craft Berthing Facilities*

UFC 4-159-03, *Design: Moorings*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS Section 03 01 30.71, *Concrete Rehabilitation*

UFGS Section 03 31 29, *Marine Concrete*

UFGS Section 09 97 13.26, *Coating of Steel Waterfront Structures*

UFGS Section 09 97 13.27, *Exterior Coating of Steel Structures*

UFGS Section 09 97 13.28, *Protection of Buried Steel Piping and Steel Bulkhead Tie Rods*

UFGS Section 31 23 00.00 20, *Excavation and Fill*

UFGS Section 31 62 13.20, *Precast/Prestressed Concrete Piles*

UFGS Section 31 62 13.24, *Concrete Cylinder Piles*

UFGS Section 32 17 23.00 20, *Pavement Markings*

UFGS Section 35 59 13.13, *Prestressed Concrete Fender Piling*

UFGS Section 35 59 13.14 20, *Polymeric Fender Piles*

UFGS Section 35 59 13.16, *Marine Fenders*

H10 1.2.2 General Requirements

H10 1.2.2.1 Subsurface Soils Information and Geotechnical Report

Any information presented in Part 6 of the RFP with regard to soil sampling and laboratory testing is for the Contractor's information only and is not guaranteed to fully represent all subsurface conditions. Contractor shall perform, at his expense, such subsurface exploration, investigation, testing, and analysis as his Designer of Record deems necessary for the design and construction of the foundation system. Contractor shall assemble all boring logs and present them in the design plans.

H10 1.2.2.2 Earthwork

The Designer of Record shall utilize UFGS Section 31 23 00.00 20 , *Excavation and Fill*, for the project specification.

H10 1.2.2.3 Marine Concrete

The Designer of Record shall utilize UFGS Section 03 31 29, *Marine Concrete*, including the use of epoxy coated rebar, for the project specification covering concrete components used in waterfront superstructure, substructure, deck and mooring and berthing systems, unless noted otherwise. The maximum water-cement ratio and minimum compressive strength shall be 0.40 and 5000 psi (35 MPa) respectively.

H10 1.2.2.4 Concrete Cover

Concrete components submerged in water or subjected to water spray shall have a minimum of 3 inches (75 mm) concrete cover over reinforcing steel or prestressing steel.

H10 1.2.2.5 Coating of Steel Waterfront Structures

The Designer of Record shall utilize UFGS Section 09 97 13.26, *Coating of Steel Waterfront Structures*, for the project specification covering coating of galvanized and non-galvanized steel structure elements such as piles, sheet piles, fender piles, power booms, power mounds, mooring hardware, and other miscellaneous steel items located on the waterfront structure and exposed to water immersion, water splash and spray, high humidity or tropical environmental condition.

Coating of miscellaneous steel items located on the waterfront structure and not exposed to water immersion, water splash and spray, high humidity or tropical environmental condition can follow UFGS Section 09 97 13.27, *Exterior Coating of Steel Structures*.

H10 1.2.2.6 Stainless Steel

Stainless steel when used shall be Type 316 or 316L.

H10 1.2.2.7 Dewatering

Dewatering requirements and methods shall be established by the Contractor's Structural/Geotechnical Engineers, based on his subsurface exploration and investigation considering soil conditions and local subsurface waters and surface water, including rainfall. Any dewatering discharge will require a NPDES permit.

H10 1.2.2.8 Permit and Environmental Control

Waterfront structure work shall meet the permit and environmental control requirements of Section 01 57 19.00 20, *Temporary Environmental Controls*, in Part 2. In-water construction shall not commence until the required USACOE permits are obtained and shall meet the conditions stipulated in the USACOE permits.

H10 1.2.2.9 Repair and Rehabilitation

Repair and rehabilitation of waterfront structure, if required, shall cover concrete spalls, delaminations and cracks and steel corrosion. Concrete repair and rehabilitation shall follow the requirements of UFGS Section 03 01 30.71, *Concrete Rehabilitation*. Detailed existing condition inspection shall be done during the design phase. Inspection shall be performed by certified concrete technicians or structural engineers to identify and document the size and locations of cracks, spalls, delaminations, corrosion and other deteriorations on the existing structure. Underwater inspection shall be performed by qualified divers with similar qualifications as the underwater inspectors used for Underwater Quality Control (UWOC) described in the "Underwater Inspection" paragraph of this PTS Section.

H10 1.3 QUALITY ASSURANCE

Qualifications, certifications, and Test Plans indicated herein shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

The Designer of Record is responsible for approving the submittals listed below.

H10 1.3.1 Earthwork

Perform quality assurance for earthwork in accordance with IBC Chapter 17 and UFGS Section 31 23 00.00 20, *Excavation and Fill*. A registered Professional Engineer shall provide inspection of excavations and soil/groundwater conditions throughout construction. The Engineer shall be responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Engineer, with the concurrence of the Contractor and the Contracting Officer, shall update the excavation, sheeting, and dewatering plans as construction progresses to reflect actual site conditions and shall submit the updated plan and a written report (with professional stamp) at least monthly informing the Contractor and the Contracting Officer of the status of the plan and an accounting of Contractor adherence to the plan; specifically addressing any present or potential problems. The Engineer shall be available to meet with the Contracting Officer at any time throughout the contract duration. The contractor shall bear all costs of the Engineer.

H10 1.3.2 Piles

Perform quality assurance for pile construction in accordance with UFC 3-220-01. Pile installation procedures and installed piles shall be inspected and found to be in compliance with these specifications prior to acceptance of the work. Concrete piles, if used for the project and inspected to contain cracks completely around the piles, shall be replaced at no additional cost to the Government. Refer to the "Underwater Inspection" paragraph of this PTS Section for special inspection requirements.

Install indicator test piles as directed by the Contractor's Structural/Geotechnical Engineer. The load capacity of piles, as determined by pile driving formulae or geotechnical analysis, shall be verified by load tests or by dynamic pile analyzer methods. Test pile installation procedures shall be as directed by the Contractor's Structural/Geotechnical Engineer. Results of the indicator test pile program and final pile installation criteria shall be submitted to the Contracting Officer prior to installation of the production piles.

H10 1.3.3 Underwater Inspection

Contractor's Underwater Quality Control (UWQC) Team shall perform underwater surveillance and inspection of all under water construction. The UWQC lead diver shall be thoroughly familiar with the design plans and specifications to sufficiently understand the

engineering aspects of the underwater construction and to be able to recognize and document potential problem areas such as improperly constructed or defective work. A report including photographs and/or videos shall be prepared and submitted with the QC report after each dive. The report shall include a description of all improperly constructed or defective areas and conditions. Frequency of underwater surveillance and inspection shall be after substructure installation and prior to superstructure and deck construction, after project construction is completed, and after all repairs to improperly constructed or defective areas and conditions have been completed. In addition to underwater conditions, survey and inspect above water, below deck conditions.

Contractor shall repair and correct all improperly constructed or defective areas and conditions identified in the report at no additional cost to the Government. Prior to performing any work, submit to the Contracting Officer for approval the repair or corrective actions to be taken including plans and specifications.

H10 1.3.4 Marine Concrete

Quality Assurance requirements for Marine Concrete shall be in accordance with the UFGS Section 03 31 29, *Marine Concrete*.

If project is located outside of the mainland U.S. and Hawaii, Contractor is advised that the Chloride Ion Test required per UFGS Section 03 31 29, *Marine Concrete*, is a long lead item (the test will take at least 60 days) and it may be necessary to have the test done in the U.S mainland.

H10 1.4 DESIGN SUBMITTALS

Design submittals shall be in accordance with PTS Section Z10, *General Performance Technical Specification*, Section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-301-01, *Structural Engineering*, and UFC 4-152-01, *Design: Piers and Wharves*.

Additional design submittals for waterfront structure construction are as follows:

Concept Design Submittal:

Conceptual substructure, superstructure and deck layout and structural framing plans

Concept substructure and slope and wave protection layout plans

Concept design report to describe the system and justification of the selections. The submittal shall include a detailed description including sketches of all proposed in-water construction adequate for the USACOE permit application.

Design Development Submittal:

Existing condition inspection report

Preliminary substructure, superstructure and deck layout and structural framing plans with substructure locations

Preliminary substructure and slope and wave protection plans with locations of facilities and type of construction finalized

Preliminary substructure sections and details with substructure sizes finalized

Preliminary slope and wave protection details

Preliminary calculations to demonstrate that the basis framing and sizing of the major substructure and superstructure elements meet the performance requirements specified in the RFP.

Preliminary geotechnical report(s) including recommendation on test pile program

100% and Final Design Submittal:

Final plans, sections and details

Final design calculations

Final geotechnical report(s)

H10 1.5 CONSTRUCTION SUBMITTALS

The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*. Construction submittals shall be in accordance with Section 01 33 00.05 20, *Construction Submittal Procedures*.

In addition to the Government Approval items listed in Section 01 33 00.05 20, the following waterfront structure related critical items shall be submitted for Government Approval:

Marine Concrete Mix Design

Pile Load Test Reports

Fender Product Data

In additional to the Government Surveillance items listed in Section 01 33 00.05 20, the following waterfront structure related items shall be submitted for Government Surveillance:

Piling Shop Drawings

Fender Piles shop Drawings

Fender Panels Shop Drawings

Mooring Hardware Shop Drawings

H1010 SUBSTRUCTURE

H101001 PILE FOUNDATIONS

Provide foundations in compliance with the requirements of this RFP and in accordance with the recommendations of the Contractor's Geotechnical/ Structural Engineers.

H101001 1.1 PILES

H101001 1.1.1 Restrictions

Restrictions are listed in the "Substructure" paragraph in ESR H10, *Waterfront Structures*, of Part 3.

H101001 1.1.2 Driving Equipment

Install piles to the required tip elevation or capacity with a pile hammer of sufficient weight and energy to suitably drive the piles without damage. Operate hammer at manufacturer's recommended speed, and drive piles without interruption using the appropriate equipment as recommended by the Contractor's Geotechnical Engineer.

a. Drive production piles with the same hammer, cap block and cushion materials, and use the same operating conditions, including pre-drilling (if allowed per this RFP), as indicator test piles.
b. Pile driving equipment shall match the equipment assumptions on which the pile driving formulae used to determine blow counts are based.

H101001 1.1.3 Installation Tolerances

a. Locate pile butts not more than 4 in (100 mm) from the location indicated at cutoff elevation. Manipulation of the piles is not permitted. In addition to the stated tolerances, the clear distance between the heads of piles and the edges of pile caps shall be determined by the Contractor’s Structural Engineer but no less than a minimum of 5 in (125 mm).
b. Locate top of sheet piles at cutoff elevation within 1/2 inch (12 mm) horizontally and 2 inch (50 mm) vertical of the location indicated. Manipulation of the piles is not permitted.
c. A variation of not more than 2 percent from the vertical for plumb piles, or not more than 4 percent from the required angle for batter piles will be permitted.

H101001 1.1.4 Mislocated and Damaged Piles

Remove and replace with new piles those piles that are cracked, damaged, mislocated, or installed out of alignment tolerance or provide additional piles, installed as directed by the Contractor's

Structural/Geotechnical Engineer, at no additional cost to the Government.

H101001 1.1.5 Pile Driver Analyzer

The dynamic wave equation method of analysis, pile driver analyzer, shall be used to validate pile and pile hammer compatibility, establish pile driving criteria, and establish terminal penetration resistance.

H101001 1.1.6 Pile Spacing

For cast-in-place concrete or augercast piles, provide adequate distance, as determined by the Contractor's Structural / Geotechnical Engineer, between freshly placed concrete and other pile installation operations to avoid damage to concrete.

H101001 1.1.7 Prestressed Concrete Piling

The Designer of Record shall utilize UFGS Section 31 62 13.20, *Precast/Prestressed Concrete Piles*, or 31 62 13.24, *Concrete Cylinder Piles*, for the project specification.

H101001 1.1.8 Reinforced Concrete Drilled Shaft

Concreting of reinforced concrete drill shaft with water inside the shaft shall be done using the tremie method of concrete placement. Disposition of the displaced water shall meet the environmental control requirements of Section 01 57 19.00 20, *Temporary Environmental Controls*, of Part 2. For concrete placed under water, non-destructive test method shall be specifies to verify the integrity of the concrete.

H101001 1.1.9 Steel Pipe Piles

Steel pipe pile with spiral-butt or spiral-lap seams shall not be used.

H101001 1.1.10 Coating for Steel Piles

For steel piles in contact with water, provide cathodic protection of the piles meeting the requirements of the "Cathodic Protection System" paragraph in PTS Section G40, *Site Electrical Utilities*. In addition, apply protective coating conforming to SSPC PS 11.01 and UFGS Section 09 97 13.26, *Coating of Steel Waterfront Structures*, on all surfaces of the steel piles exposed to water for corrosion protection. Handle treated or coated piles so as to protect the treatment or the coating. Repair damage or defects to treatment or coating.

H101001 1.2 SHEET PILES

Sheet pile can be used to provide vertical support to waterfront structure and shall be of either steel, precast reinforced concrete or fiberglass reinforced plastic construction. Refer to the "Sheet Pile Bulkhead" paragraph of this PTS Section for additional, including corrosion protection, requirements.

H101001 1.3 CAISSONS

Caisson can be used to provide vertical support to waterfront structure. Refer to the "Caissons" paragraph under "Quays" paragraph in this PTS Section for additional requirements.

H101001 1.4 COFFERDAMS

Cofferdam can be used to provide vertical support to waterfront structure and shall be constructed of steel sheet pile cells. Refer to the "Sheet Pile Bulkhead" paragraph in this PTS Section for additional requirements.

H101001 1.5 WRAPS AND ENCASEMENTS

Existing piles can be repaired by wrapping or encasing with non-corrosive material including but not limited to fiberglass reinforced plastic and reinforced concrete.

H101001 1.6 OTHER PILE FOUNDATION ELEMENTS

Not used.

H101002 PILE CAPS

Pile caps that are in contact with water (including ground water), and water spray shall meet the requirements of the "Marine Concrete" paragraph, including the use of epoxy coated rebar, in this PTS Section. Use of non-marine concrete and non-epoxy coated rebar in buried pile caps placed above ground water may be considered. Concrete cover on reinforcing steel, steel piling and other embedded steel items shall be at least 3 inches (75 mm).

H101003 QUAYS

Guidance on seismic performance requirement for tie-back sheet pile bulkheads and gravity retaining structures (including caissons) located in high seismic areas can be found in the Criteria Section of NFESC Technical Report TR-3103-SHR, *Seismic Criteria for California Marina Oil Terminals*(referenced from UFC 4-152-01).

H101003 1.1 SHEET PILES BULKHEAD

Sheet pile bulkhead can be used as a solid retaining structure and can be either of steel, reinforced precast concrete or fiberglass reinforced plastic construction with tie-back anchors or other means of anchors. Backfill behind the bulkhead shall be designed and constructed to minimize its liquefaction potential. Corrosion protection of steel sheet pile shall be in accordance with the requirements of the "Coating of Steel Piles" paragraph in this PTS Section. Top of sheet piles shall be encased in a reinforced concrete pile caps (refer to the "Pile Caps" paragraph in this PTS Section). Scour protection at the mud-line shall be considered in the design of sheet pile bulkhead.

H101003 1.1.1 Tie-Back Anchors

Design of the bulkhead and its tie-back anchors shall consider liquefaction potential of the site and the backfill behind the bulkhead. For tie-back anchors using piles and piles caps, refer to

requirements in the "Piles" and "Pile Caps" paragraphs in this PTS Section.

H101003 1.1.2 Tie Rods

Corrosion protection shall be provided for steel tie-rods. Means of corrosion protection shall include cathodic protection meeting the requirements of "Cathodic Protection System" paragraph in PTS Section G40, *Site Electrical Utilities*, and either coated or tape-wrapped conforming to UFGS Section 09 97 13.28, *Protection of Buried Steel Piping and Steel Bulkhead Tie*.

H101003 1.2 CONCRETE GRAVITY WALLS

Concrete gravity walls can be used as a solid retaining structure and shall be of cast-in-place or precast concrete block construction. Backfill behind the gravity walls shall be designed and constructed to minimize its liquefaction potential. Scour protection at the mud-line shall be considered in the gravity wall design.

H101003 1.3 BLOCK WALLS

Block walls constructed of masonry or stone blocks shall be reinforced with steel reinforcing bar and can be used for minor quay wall construction. Block wall shall not be used to retain the embankment in the primary wharf or pier structure.

H101003 1.4 CAISSONS

Precast reinforced concrete caissons can be used as a solid retaining structure. Backfill behind the caissons shall be designed and constructed to minimize its liquefaction potential. Scour protection at the mud-line shall be considered in the caisson design.

H101003 1.5 CRIBS

Crib wall of precast reinforced concrete units can be used for minor quay wall construction and cannot be used to retain embankment in the primary wharf or pier structure. Crib wall using steel units shall not be allowed.

H101003 1.6 OTHER QUAY ELEMENTS

Not used.

H101004 RELIEVING PLATFORMS

Relieving platform can be used in conjunction with a sheet pile bulkhead (with or without tie-back anchors) to reduce the lateral load on the sheet pile created by heavy surcharge load. Relieving platform consists of the following components: piles, sheet pile, pile caps, deck and fill. Requirements of these components are provided under the "Piles", "Sheet Piles", "Pile Caps" and "Deck" of this PTS Section.

H101005 REVETMENTS

Revetment can be used to retain the embankment either along the waterfront or upland

to the pile-supported wharf or pier. Revetments can be constructed of rock dike or granular fill material. Refer to Section H30, *Coastal Protection*, for additional requirements. Design of the revetment shall consider liquefaction potential of the site. Guidance on seismic performance requirements of revetment in high seismic areas can be found in the Criteria Section of NFESC Technical Report TR-3103-SHR, *Seismic Criteria for California Marina Oil Terminals*(referenced from UFC 4-152-01). A cut-off wall (curtain wall) shall be provided at the interface between the pile-supported wharf/pier and the upland area (refer to the "Cut-Off Wall" paragraph in this PTS Section).

H101006 SEAWALLS

Seawall shall be designed to retain the soil behind the wall and to protect the waterfront from wave erosion. Seawall can be constructed to retain fill above a caisson, cofferdam, revetment, concrete gravity wall or natural ground and shall be of reinforced concrete construction. Scour protection at the base of the wall shall be considered in the seawall design.

H101007 BOAT RAMPS

Boat ramp shall be designed to accommodate the launching of the specified boats and shall be constructed of sheet pile or reinforced concrete walls and reinforced concrete slab.

H101008 CUT-OFF WALLS

Cut-off walls or curtain walls shall be constructed at the interface between the wharf/pier deck and the backland and shall be designed to retain the land side soil without loss of material. Cut-off-wall can be either of reinforced concrete or steel/concrete sheet pile construction.

H101009 FIREWALLS AND HANGING PANELS

H101009 1.1 FIRE WALLS

Fire walls shall be provided for timber wharf/pier.

H101009 1.2 WAVE ATTENUATION PANELS

For site with high waves, pile supported wharf/pier shall be designed for the uplift wave forces. Wave attenuation panels can be installed to mitigate the wave impact to the wharf/pier structure.

Design life of the wave attenuation panels shall be the same as the primary wharf/pier structure.

H101009 1.3 OTHER WALLS AND PANELS

Not used.

H101090 OTHER SUBSTRUCTURE COMPONENTS

Not used.

H1020 SUPERSTRUCTURE

H1020 1.1 STRUCTURAL FRAME

For pile supported waterfront structures, the deck shall be supported on a lateral load resisting structural frame.

Structural frame elements of pile supported waterfront structures will include piling, columns, girders, beams and deck slab. No exposed steel deck framing will be allowed.

H1020 1.2 MAIN LATERAL-FORCE RESISTING SYSTEM

Any main lateral-force resisting system meeting the requirements of this Section may be used.

H102001 BEAM AND GIRDERS

For single level, or the lower level of a double level wharf/pier, beams and girders can be the same as the pile caps. Steel beam and girder shall be encased in non-corrosive material such as reinforced concrete, and fiberglass reinforced plastic. The deck shall be integrated with and composite to the beam and girder system. Beams and girders can be embedded into the deck slab for wharf/pier with thick deck. Refer to the "Deck" paragraph of this PTS Section for additional requirements.

H102002 COLUMNS

For single level wharf/pier, the supporting piles can be the same as the columns. For double level wharf/pier, the upper level can be supported on columns non-continuous from the lower lever columns/piles. Steel columns shall be encased in non-corrosive material such as reinforced concrete, and fiberglass reinforced plastic.

H102003 UTILITY ENCLOSURES

H102003 1.1 UTILITY VAULTS

Provide electrical pits/vaults under electrical power outlet assemblies and for above-deck substations and provide electrical manholes and handholes as required to meet the functional requirements of the "Electrical Utilities" paragraph in PTS Section H50, *Waterfront Utilities*. Use of below-deck substations/transformers (housed in a vault) is discouraged and its use will require special approval as specified in UFC 4-150-02.

Pits, vaults, manholes and handholes shall be constructed of reinforced concrete with water proof joints and seals to prevent sea and ground water infiltration. Manhole and handhole covers shall have sealed joints to preclude runoff and deck surface spills from entering the cavities. These covers shall be of concrete or steel construction and shall be designed for all waterfront structure live load. Manhole and handhole covers shall have lifting devises or means of lifting to facilitate removal of the covers. Provisions shall be made to drain any water accumulation inside the pits.

Concrete pits, vaults, manholes and handholes integrated with the pile supported deck shall meet the requirements of the "Marine Concrete" paragraph in this PTS Section. Use of non-marine concrete in manholes and handholes buried in soil and not integrated with the deck concrete can be

used.

All exposed steel shall be protected from corrosion.

H102003 1.2 UTILITY TRENCHES

Provide utility trenches and covers as required to meet the functional requirements of the "Civil/Mechanical Utilities" paragraph in PTS Section H50, *Waterfront Utilities*.

Trenches shall be constructed of reinforced concrete with water proof joints and seals to prevent sea and ground water infiltration. Trench covers, except at location of the utility stations, shall have sealed joints to preclude runoff and deck surface spills from entering the trench. Trench covers shall be of reinforced concrete or steel construction and shall be designed for all waterfront structure live loads. Trench covers shall have lifting devises or means of lifting to facilitate removal of the covers. Provisions shall be made to drain any water accumulation inside the trenches.

Concrete utility trench integrated with the pile supported deck shall meet the requirements of the "Marine Concrete" paragraph in this PTS Section. Use of non-marine concrete in utility trenches buried in soil and not integrated with the deck concrete can be used.

All exposed steel components shall be protected from corrosion.

H102090 OTHER SUPERSTRUCTURE ELEMENTS

Not used.

H1030 DECK

H103001 DECK

For open type of wharf/pier where the deck is supported on piles, waterfront structure deck shall be integrated with the framing system (beams, girders and columns system) meeting the requirements of the "Superstructure" paragraph in this PTS section. This elevated deck shall be of reinforced concrete construction meeting the requirements of the "Marine Concrete" paragraph in this PTS Section.

Electrical and communication conductors shall be contained in conduits embedded in the elevated deck, contained in concrete jacket below the deck, or supported by a raceway system inside an enclosure such as a covered utility trench/tunnel. Thickness of wharf concrete deck element shall be as required to adequately provide for size, number and concentration of conduit. Refer to the "Electrical Utilities" paragraph in PTS Section H50, *Waterfront Utilities*, for additional requirements.

The following systems shall not be used for this project: non-composite or composite concrete slabs on steel form deck, precast concrete soffit slabs without composite cast-in-place concrete overlay, wood deck on concrete, wood, or steel framing, and steel deck on concrete, wood or steel framing.

Elevated deck on wharf/pier shall be sloped to drain to the harbor (where allowed by local resource agencies) or to collection (where required by local resource agencies).

H103002 ON-GRADE SLAB

For wharf/pier deck supported on grade, provide Portland cement concrete pavement, asphalt concrete pavement, or structural reinforced concrete slab as required to meet the specified service conditions and loading in accordance with the requirements of this PTS Section, PTS Section G20 (for pavement design) and other portions of this RFP.

On-grade slab or pavement on wharf/pier shall be sloped to drain to the harbor (where allowed by local resource agencies) or to collection (where required by local resource agencies).

H103003 DECK OVERLAY

Concrete overlay placed on precast concrete soffit slabs shall be of composite reinforced concrete construction with reinforcing ties or stirrups connecting the overlay and precast slabs.

H103004 CURBS AND BULLRAILS

Curbs and bullrails meeting the requirements of Paragraph 4-7.3 in UFC 4-152-01 shall be provided along the waterside edges of wharf/pier. Curbs and bullrails shall be of reinforced concrete construction meeting the requirements of the "Marine Concrete" paragraph in this PTS Section.

H103005 MOORING FOUNDATIONS

Foundation shall be provided for mooring hardware such as bollards, double bitts and cleats. The mooring hardware foundations shall be adequate to resist the rated capacity of the hardware. Mooring hardware foundations on open wharf/pier shall be anchored into the deck and support framing. Mooring hardware foundations on-grade shall be of reinforced concrete construction supported on piles if recommended by the Contractor's Structural/Geotechnical Engineers. Fully embedded anchor bolts shall be galvanized. Anchor bolts with exposed ends shall be of stainless steel.

H103006 HIGH MAST LIGHTING FOUNDATIONS

Foundation shall be provided for high mast light pole or regular light poles. Light pole foundations design shall meet the requirements IBC. Light pole foundations on open wharf/pier shall be anchored into the deck and support frame. Light pole foundations on grade shall be of reinforced concrete construction supported on piles if recommended by the Contractor's Structural/Geotechnical Engineers. Fully embedded anchor bolts shall be galvanized. Anchor bolts with exposed ends shall be of stainless steel.

H103007 UTILITY MOUNDS

Electrical outlet assemblies and other electrical utility components shall be housed inside a power mounds. Power mound enclosure shall be constructed of the concrete or steel as specified in the "Deck" paragraph in ESR H10, *Waterfront Structures*, of Part 3. Power mound shall be designed to be waterproof and to withstand the wind and wave loads that existing at the waterfront.

H103008 EXPANSION JOINTS

Expansion joint shall be armored with steel as specified in the "Deck" paragraph in ESR H10, *Waterfront Structures*, of Part 3. Differential settlement across the joint shall be less than 1/8-inch (3 mm).

H103009 GUARD POSTS AND RAILING

Guard posts shall be provided to protect deck components including, but not limited to, light poles, telecommunication stations, life ring stations, and similar components from damaged by equipment and vehicle moving on the wharf/pier. Railing shall be provided for personnel protection. Guard posts and railing shall be of coated galvanized steel construction.

Pipe railing shall be constructed over utility risers to protect the risers from snagging of mooring lines. This pipe railing shall be constructed of steel piping as specified in the "Pipe Guardrail" paragraph in PTS Section H50, *Waterfront Utilities*, and the "Deck" paragraph in ESR H10, *Waterfront Structures*.

H103010 PAINT STRIPING

Paint striping shall follow the requirements of UFGS 32 17 23.00 20, *Pavement Markings*. Color shall be determined by the Contractor’s Designer-of-Record.

H103010 1.1 DECK STRIPING

Striping shall be provided on the wharf/pier deck. Striping requirements shall be determined based on safety consideration and to identify different operational areas. Minimum striping requirements are shown on the RFP drawings provided in Part 6.

H103010 1.2 CURB STRIPING

Paint new station marks on curb and bullrail along waterfront of wharf/pier at spacing of approximately every 25 feet (7.5 meters).

H103090 OTHER DECK COMPONENTS

Not used.

H1040 MOORING AND BERTHING SYSTEM

H104001 PRIMARY FENDER SYSTEM

H104001 1.1 FENDER PILES

Fender piles used in the primary fender system shall be closely spaced to provide adequate support to the fenders, or camels. Fender piles used in secondary fender system shall have maximum spacing of 10 feet (3 m).

Fender pile blockings and chocks shall be of plastic timber construction. Connecting hardware including but not limited to nuts, bolts, washers, brackets and pile collars for the fender pile system shall be of 316 or 316L stainless steel or galvanized steel construction. Provide UHMW polyethylene rubbing strips (secured by stainless steel fasteners) on the front face of each fender pile. For steel fender piles, if used, provide cathodic protection meeting the requirements of the "Cathodic Projection System" paragraph in PTS Section G40, *Site Electrical Utilities*, and apply

protective coating conforming to SSPC PS 11.01 and UFGS Section 09 97 13.26, *Coating of Steel Waterfront Structures*.

No timber fender piles will be allowed.

H104001 1.2 FENDER FRAMING

Fender framing or panels may be required to support the fender or fender pile clusters. The framing can be of either stainless steel or coated and cathodically protected steel construction. The fender panels shall be of concrete or coated and cathodically protected steel construction.

H104001 1.3 FENDERS

Support framings or backing panels suitable for the type of fender used shall be provided. Refer to the "Fender Framing" paragraph in this PTS Section for additional requirements.

H104001 1.4 EXTRUDED FENDERS

Extruded fenders shall meet the "extruded fenders" related requirements in UFGS Section 35 59 13.16, *Marine Fenders*.

H104001 1.5 MOLDED FENDERS

Molded fenders shall meet the "molded fenders" related requirements in UFGS Section 35 59 13.16, *Marine Fenders*.

H104001 1.6 FOAM-FILLED FENDERS

Foam-filled fenders shall meet the "foam-filled fenders" related requirements in UFGS Section 35 59 13.16, *Marine Fenders*.

H104001 1.7 PNEUMATIC AND HYDRO-PNEUMATIC FENDERS

Pneumatic and hydro-pneumatic fenders shall meet the "pneumatic and hydro-pneumatic fender" related requirements in UFGS Section 35 59 13.16, Marine Fenders.

H104001 1.8 CAMELS

Camels design shall follow the design guidance in Paragraph 6-8 of UFC 4-152-01.

H104002 SECONDARY FENDER SYSTEM

Secondary fender system shall be provided between the primary fenders along the wharf/pier waterfront to protect wharf/pier from accidental contact with ships or routine berthing of barges and small crafts.

Refer to the "Fender Piles" and "Fender Framing" paragraphs in this PTS Section for requirements of fender piles used in secondary fender system.

H104003 CORNER FENDER SYSTEM

Corner fender system shall be provided at all corners of wharf/pier for accidental

contact with ships or routine contact with tug boats. Refer to the "Fender Piles" and "Fender Framing" paragraphs in this PTS Section for additional requirements.

H104004 DOLPHINS

Breasting dolphin or mooring dolphins, if used shall meet the applicable requirements of the "Substructures", "Superstructure", and "Deck" paragraphs in this PTS Section.

H104005 MOORING HARDWARE

H104005 1.1 BOLLARDS

H104005 1.2 DOUBLE BITTS

H104005 1.3 CLEATS

H104005 1.4 QUICK RELEASE HOOKS

Not used.

H104005 1.5 CAPSTANS AND WINDLASSES

Not used.

H104090 OTHER MOORING AND BERTHING COMPONENTS

Not used.

H1050 APPURTENANCES

H1050 1.1 HANDRAILS

H1050 1.2 BROWS

Brow design shall follow the design guidance provided in Paragraph 7-4 of UFC 4-152-01.

H1050 1.3 ELECTRICAL POWER CABLE BOOMS

For requirements for electrical power cable booms, refer to the "Electrical Power Cable Booms for Berthing of Submarine" paragraph in PTS Section H50, *Waterfront Utilities*.

H1050 1.4 FLOATS

Landing float design shall follow the design guidance provided in Paragraph 7-3 of UFC 4-152-01.

H1050 1.5 SAFETY LADDERS

Safety ladders shall be provided along the wharf/pier waterfront. Safety ladders shall be of Type 316 L stainless steel or fiberglass reinforced plastic construction and shall be spaced no more than 200 feet (60 meters). The bottom of the ladders shall be extended at least 2 feet (600 mm) below the MLLW. Member size for connections shall be 3/8-inch (10 mm) thick

minimum. Ladder shall be designed for 300 pounds (1.33 kN) rated capacity minimum and a minimum of 250 pounds (1.11 kN) lateral load applied anywhere on the ladder. In all cases, the ladder shall meet OSHA requirements.

H1050 1.6 LIFE RINGS

Life rings with support stands and 90 feet (27 meters) rope minimum, spaced no more than 150 feet (45 meters) shall be provided along the wharf waterfront. The support stand shall be of stainless steel construction.

H1050 1.7 OIL CONTAINMENT BOOM AND SUPPORT ATTACHMENTS

-- End of Section --

SECTION H30

COASTAL PROTECTION
09/15

H30 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

H30 1.1 NARRATIVE

This Section must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation.

This Section covers the design and construction requirements for the coastal protection, described in ESR H30, Coastal Protection, of Part 3 and as identified on the RFP drawings provided in Part 6.

H30 1.2 COASTAL PROTECTION DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*.

H30 1.2.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-220-01, *Geotechnical Engineering*

UFC 4-150-06, *Military Harbors and Coastal Facilities*

US ARMY CORPS OF ENGINEERS (COE)

COE EM 1110-2-1100, *Coastal Engineering Manual*

COE EM 385-1-1, *Safety and Health Requirements Manual*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS Section 03 31 29, *Marine Concrete*

UFGS Section 31 23 00.00 20, *Excavation and Fill*

H30 1.2.2 General Requirements

H30 1.2.2.1 Subsurface Soils Information and Geotechnical Data

Any information presented in Part 6 of this RFP with regard to soil sampling and laboratory testing is for the Contractor's information only and is not guaranteed to fully represent all subsurface conditions. Contractor shall perform, at his expense, such subsurface exploration, investigation, testing, and analysis as his Designer of Record deems necessary for the design and construction of the coastal protection system. Contractor shall assemble all boring logs and present them in the design plans.

H30 1.2.2.2 Stone

Quality of Stone used in Coastal Protection system shall conform to the specified requirements when tested as specified in this Section. Visual examination of the quarry, including examination of the blast samples, suitable tests and service records shall be required to determine the acceptability of the stone. To ensure the required quality, stone shall be subject to petrographic analysis and X-ray diffraction analysis conforming to ASTM C 295, as well as specific gravity, absorption, durability and wetting and drying tests as follows:

TEST	TEST METHOD	REQUIREMENT
Apparent Specific Gravity	ASTM C 127	2.55 min.
Absorption	ASTM C 127	2.0% max.
Durability	ASTM C 535	50% max. after 1000 revs.
Sulfate Soundness	ASTM D 5240	10% max. after 5 cycles(magnesium sulphate)

The size and quantity of test specimens used for the tests listed above shall conform to the requirements of ASTM D 4992.

Contractor may be required to provide representative samples of the proposed stone materials from each stone source. The samples shall consist of sufficient individual pieces to allow reviewing of stone quality and gradation. In no case shall the sample be less than 110 pounds (50 kg).

Stone that comes from off-island sources must be thoroughly washed and disinfected at the source in accordance with the provisions of Territory of Guam, Executive Order No. 91-16, Relative to the Importation of Sand and Other Quarried Materials. Stone shall also be suitable for Ocean Dumping

Permit Evaluations.

H30 1.2.2.3 Permit and Environmental Control

Coastal protection work shall meet the permit and environmental control requirements of Section 01 57 19.00 20, *Temporary Environmental Controls*, in Part 2. In-water construction shall not commence until the required USACOE permits are obtained and shall meet the conditions stipulated in the USACOE permits.

H30 1.3 QUALITY ASSURANCE

Qualifications, certifications, and Test Plans indicated herein shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

The Designer of Record is responsible for approving the submittals listed below.

H30 1.3.1 Earthwork

Perform field quality control required in Section 31 23 00.00 20, *Excavation and Fill*.

H30 1.3.2 Stone Quality

Submit all tests specified in the "Stone" paragraph in this PTS Section for review prior to loading stone for transport. Stone is not to be shipped until the quality of the stone has been certified.

Stone which does not conform in specific gravity, structure, and other characteristics, or that has substances on or within the stone that would make it unsuitable for ocean placement as described in the "Stone" paragraph in this PTS Section, will be rejected. The presence of unsatisfactory stone or objectionable foreign material in any load of stone delivered for use in the work will be deemed sufficient reason for rejection of the whole load. Any such load shall be immediately removed from the work, at Contractor’s expense.

Prior to placement, all stone shall be subject to acceptance by the Contracting Officer. Acceptance of any stone shall not constitute acceptance of all rock from a source. All accepted stone shall be of the same litho logy as the original stone from which test results or service records were taken as a basis for approval of the source.

H30 1.4 DESIGN SUBMITTALS

Design submittals shall be in accordance with PTS Section Z10, *General Performance Technical Specification*, Section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-201-01, *Civil Engineering*, and UFC 4-150-06, *Military Harbors and Coastal Facilities*.

Additional design submittals for coastal protection facility construction

are as follows:

Concept Design Submittal:

Concept wave and slope protection layout plans

Concept design report to describe the system and justification of the selections. The report also shall include a detailed description including sketches of all proposed in-water constructions adequate for the USACOE permit application

Design Development Submittal:

Preliminary wave and slope protection plans with locations and limits of facilities and type of construction finalized

Preliminary wave and slope protection details

Preliminary geotechnical report(s)

Design methodology and calculations for wave and slope protection

100% and Final Design Submittal:

Final plans, sections, details and calculations

Final geotechnical report(s)

H30 1.5 CONSTRUCTION SUBMITTALS

The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*. Construction submittals shall be in accordance with Section 01 33 00.05 20, *Construction Submittal Procedures*.

H3010 WAVE PROTECTION

Contractor shall provide wave protection at locations identified on RFP drawings provided in Part 6 and as required based on the Contractor's design.

H3010 1.1 DESIGN REQUIREMENTS

Oceanographic design parameters to be used to generate the design wave forces are as described in ESR H30, *Coastal Protection*, of Part 3. These criteria shall be considered minimum requirements. Waterfront improvements shall be subject to thorough engineering analysis using all relevant criteria that could affect the integrity and performance of the constructed waterfront improvements.

Wave protection armors shall be designed in accordance with the guidance of UFC 4-150-06 and COE EM 1110-2-1100 and to provide for sufficient hydraulic stability.

H301001 WAVE PROTECTION ARMORS

Wave protection armors shall be of natural stone or precast concrete units. Concrete used shall meet the requirements of UFGS Section 03 31 29, *Marine Concrete*.

Stone shall meet the quality requirements described in the "Stone Quality" paragraph in this PTS Section.

Minimum size of stone used as armor or rip rap for wave protection shall be as specified in "Wave Protection" paragraph in ESR H30, *Coastal Protection*, of Part 3.

H301002 BREAKWATERS

Not used.

H3020 SLOPE PROTECTION

Contractor shall provide slope protection identified on RFP drawings provided in Part 6 and as required based on the Contractor's design.

H3020 1.1 DESIGN REQUIREMENTS

Slope protection shall be provided to retain and protect existing or new embankment along the waterfront. It can either be revetments (dikes) constructed of rock, granular fill or combination of rock and granular fill with wave protection or wave protection over existing embankment. Design of the slope protection shall consider liquefaction potential of the site. Guidance on seismic performance requirements of dikes in high seismic areas can be found in the Criteria Section of NFESC Technical Report TR-3103-SHR, *Seismic Criteria for California Marina Oil Terminals*(referenced from UFC 4-152-01.

Slope protection shall be designed in accordance with the guidance of UFC 4-150-06, UFC 3-220-01 and COE EM 1110-2-1100.

H302001 ROCK REVETMENTS

Stone shall be quarry stone, angular in shape, with its largest dimension not in excess of 3 times its least dimension, and able to form a stable protection structure meeting all requirements of this RFP. Stone shall be sound, durable, hard, resistant to abrasion and free of laminations, weak cleavage planes, and the undesirable effects of weathering. Stone shall be of such character that it will not disintegrate from the action of air, water, or the conditions to be met in handling and placing. All material shall be clean and free from deleterious impurities, including alkali, earth, clay, refuse and adherent coatings.

Stone shall meet the quality requirements described in the "Stone Quality" paragraph in this PTS Section.

H302002 GRANULAR FILL REVETMENTS

Not used.

H302003 COMBINED RCOK AND GRANULAR FILL REVETMENTS

Not used.

-- End of Section --

SECTION H40

NAVIGATION DREDGING AND RECLAMATION
09/15

H40 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

H40 1.1 NARRATIVE

This Section must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation.

This Section covers the design and construction requirements for navigation dredging, and reclamation, described in ESR H40, *Navigation Dredging and Reclamation*, of Part 3 and as identified on the RFP drawings provided in Part 6.

H40 1.2 NAVIGATION DREDGING AND RECLAMATION DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*.

H40 1.2.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 4-150-06, *Military Harbors and Coastal Facilities*

U.S. ARMY CORPS OF ENGINEERS (COE)

COE EM 385-1-1, *Safety and Health Requirements Manual*
COE EM 1110-2-1003, *Hydrographic Surveying*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS Section 31 23 00.00 20, *Excavation and Fill*
UFGS Section 35 20 23, *Dredging*

H40 1.2.2 General Requirements

H40 1.2.2.1 Hydrographic Survey Data

An existing hydrographic survey map is included in Part 6 of this RFP for the Contractor's information only. The Government does not guarantee that this map fully represents all submarine surface conditions. Contractor shall perform, at his expense, such hydrographic survey as his Designer of Record deems

necessary for the design and construction of the navigation dredging and reclamation related work.

H40 1.2.2.2 Dredge Material Management Plan

Government's dredge material characterization and management plan is included in Part 6 of this RFP. Contractor’s dredging and disposal design and field operations shall following the guidelines provided in this report.

H40 1.2.2.3 Geotechnical Data

Any information presented in Part 6 of this RFP with regard to soil sampling and laboratory testing is for the Contractor's information only and is not guaranteed to fully represent all subsurface conditions. Contractor shall perform, at his expense, such subsurface exploration, investigation, testing, and analysis as his Designer of Record deems necessary for the design and construction of the navigation dredging and reclamation work. Contractor shall assemble all boring logs and present them in the design plans.

H40 1.2.2.4 Navigation and Clearance

In-water work shall minimize interference with the use of the navigation channels and passages. The Contracting Officer will direct the shifting and moving of dredges or the interruption of in-water operations to accommodate the movement of vessels and floating equipment, if necessary.

Additional details of scheduling and clearance requirements are provided in Section 01 14 00.05 20, *Work Restrictions for Design-Build*, in Part 2.

H40 1.2.2.5 UXO

If Unexploded Ordnance (UXO) is encountered, Contractor shall stop dredging operation immediately and notify the Contracting Officer for direction.

H40 1.2.2.6 Erosion and Sediment Control Plan

The erosion and sediment control plan shall include the measures required to reduce on-site erosion and off-site runoff and sedimentation. The plan shall comply with all requirements of the state or territory in which the project is located.

H40 1.2.2.7 NPDES General Permit and SWP3

National Pollutant Discharges Elimination System (NPDES) General Permit for Storm Water Discharges is required for construction sites over one acre.

The Storm Water Pollution Prevention Plan (SWP3) shall be prepared by a registered professional engineer. The SWP3 is a comprehensive program document detailing the intended methods

of complying with applicable storm water management regulations and requirements. The plan shall comply with all requirements of the state in which the project is located.

H40 1.2.2.8 Contaminated Material Removal Work Plan

The Contaminated Material Removal Work Plan shall be prepared by a design professional which meets the criteria listed herein and specially address protection of on-site personnel, workers and the environment.

H40 1.2.2.9 Field Sampling and Laboratory Test Plan

The Field Sampling and Laboratory Test Plan prepared by a design professional which meets the criteria listed herein and specially address protection of on-site personnel, workers and the environment.

H40 1.2.2.10 Permit and Environmental Control

Dredging and reclamation work shall meet the permit and environmental control requirements of Section 01 57 19.00 20, *Temporary Environmental Controls*, in Part 2. In-water construction shall not commence until the required USACOE permits are obtained and shall meet the conditions stipulated in the USACOE permits.

H40 1.2.2.11 Vessel Maneuverability Study and Channel Design

Vessel maneuverability study and channel design, if specified in ESR H40, *Navigation Dredging and Reclamation,* in Part 3 shall be performed accordance with the guidance of UFC 4-150-06.

H40 1.3 QUALITY ASSURANCE

Materials installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found to be not in compliance shall be removed, or corrective measures taken, to assure compliance with the referenced standard.

H40 1.3.1 Hydrographic Surveys

Contractor shall perform pre-dredge hydrographic survey to establish the base line sea bottom profile and post-dredge hydrographic survey to verify that the dredged depth and limits meet the RFP requirements.

Hydrographic surveys shall be performed as detailed in UFGS Section 35 20 23, *Dredging*, and meet or exceed the survey standards listed in the US Army Corps of Engineers EM 1110-2-1003 (Hydrographic Surveying) for Class I surveys. Surveys shall be done in compatible datum as listed in the RFP drawings provided in Part 6. The hydrographic surveying firm selected by the Contractor must be approved by the Contractor's Engineer of Record prior to performing surveys for this Contract.

H40 1.3.2 Earthwork

Perform field quality control required in Section 31 23 00.00 20 , *Excavation and Fill*.

H40 1.4 DESIGN SUBMITTALS

Design submittals shall be in accordance with PTS Section Z10, *General Performance Technical Specification*, UFGS Section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, UFC 3-201-01, *Civil Engineering*, and UFC 4-150-06, *Military Harbors and Coastal Facilities*.

Additional design submittals for dredging and reclamation are as follows:

Concept Design Submittal:

Preliminary vessel maneuverability study and channel design report if required per ESR H40, *Navigation Dredging and Reclamation*, in Part 3

Concept dredging and reclamation layout plans

Concept design report to provide detailed description including sketches describing all proposed in-water constructions adequate for the USACOE permit application

Detailed dredge disposal plan including where, how and permitting information.

Design Development Submittal:

Final vessel maneuverability study and channel design report if required per ESR H40, *Navigation Dredging and Reclamation*, in Part 3

Preliminary dredging and reclamation plans with locations, limits and phasing of construction and type of construction finalized

Preliminary dredging and reclamation details

Preliminary geotechnical report(s)

100% and Final Design Submittal:

Final plans, sections and details

Final geotechnical report(s)

H40 1.5 CONSTRUCTION SUBMITTALS

The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*. Construction submittals

shall be in accordance with Section 01 33 00.05 20, *Construction Submittal Procedures*.

H4010 DREDGING

Contractor shall dredge to the depths described in ESR H40, *Navigation Dredging and Reclamation*, of Part 3 the channel, turning basin and berth areas as identified on RFP drawings provided in Part 6 or as required to be determined by the Contractor. Contractor's Designer-of Record shall edit UFGS Section 35 20 23, *Dredging*, for the project specification. No blasting will be permitted to perform dredging.

H4020 DREDGE DISPOSAL

Contractor shall dispose of the dredge material at the disposal site(s) described in ESR H40, *Navigation Dredging and Reclamation*, of Part 3.

H402001 OCEAN DISPOSAL

Information on the ocean disposal site if used is provided in ESR H40, *Navigation Dredging and Reclamation*, in Part 3.

H402002 NEW CONFINED DISPOSAL FACILITIES

The new confined disposal facility if required in accordance to ESR H40, *Navigation Dredging and Reclamation*, in Part 3, shall have adequate capacity to store the dredged material including considerations for over-dredge allowance and bulk factor.

H402003 EXISTING CONFINED DISPOSAL FACILITY

Information on the existing confined disposal facility, if used, is provided in ESR H40, *Navigation Dredging and Reclamation*, in Part 3.

H4030 RECLAMATION

Locations of reclamation are identified in the drawings provided in Part 6 or as required to be determined by the Contractor. Handling of the material shall be as specified within UFGS Section 31 23 00.00 20, *Excavation and Fill*.

-- End of Section --

SECTION H50

WATERFRONT UTILITIES
4/08

H50 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

H50 1.1 NARRATIVE

This Section must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation.

This Section covers installations within the waterfront facility. See PTS Sections G30, *Site Civil/Mechanical Utilities*, G40, *Site Electrical Utilities*, for continuation of systems beyond the five foot line.

H50 1.2 WATERFRONT UTILITIES DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*.

H50 1.2.1 Government Standards

UNITED FACILITIES CRITERIA (UFC)

UFC 3-201-01, *Civil Engineering*

UFC 3-600-10N, *Fire Protection Engineering*
UFC 4-150-02, *Dockside Utilities for Ship Service*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS Section 09 97 13.26, *Coating of Steel Waterfront Structures*
UFGS Section 26 05 33, *Dockside Power Connection Stations*

H50 1.3 QUALITY ASSURANCE

Qualifications, certifications, and Test Plans indicated herein shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

The Designer of Record is responsible for approving the submittals listed below.

H50 1.3.1 Waterfront Civil/Mechanical Utilities

For waterfront civil/mechanical utilities quality assurance requirements, refer to applicable portion of the "Quality Assurance" paragraph in PTS Section G30, *Site Civil/Mechanical Utilities*.

H50 1.3.2 Waterfront Electrical Utilities

For waterfront electrical utilities quality assurance, refer to applicable portions of the "Quality Assurance" paragraph in PTS Section G40, *Site Electrical Utilities*.

H50 1.3.3 Waterfront Fire Protection

For waterfront fire protection quality assurance requirements, refer to applicable portion of the "Quality Assurance" paragraph in PTS Section D40, *Fire Protection*.

H50 1.4 DESIGN SUBMITTALS

Design submittals shall be in accordance with PTS Section Z10, *General Performance Technical Specification*, Section 01 33 10.05 20, *Design Submittal Procedures*in Part 2, UFC 3-201-01, *Civil Engineering*, UFC 3-401-01, *Mechanical Engineering*, UFC 3-501-01, *Electrical Engineering*, UFC 3-600-10N, *Fire Protection Engineering*, and UFC 4-150-02, *Dockside Utilities for Ship Services*.

H50 1.5 CONSTRUCTION SUBMITTALS

The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*. Construction submittals shall be in accordance with Section 01 33 00.05 20, *Construction Submittal Procedures*in Part 2.

If an OMSI manual is not a contract requirement, then provide product data for all equipment; and submit operation and maintenance data in accordance with Section 01 78 24.00 20, *Electronic Facility Operation and Maintenance Support Information*in Part 2.

Provide certification that all adjustable protective device settings have been set in accordance with the coordination study for the as-built equipment and configuration.

H5010 CIVIL/MECHANICAL UTILITIES

H5010 1.1 PIPE LOCATION

Piping on deck with asphalt concrete pavement can be either placed underground, in a concrete trench or on a ledge outboard of the pier/wharf concrete curb/bullrail. Piping on elevated concrete deck or concrete deck on-grade can be placed in a concrete trench or on a ledge outboard of the pier/wharf concrete curb/bullrail. For utility trench requirements, refer to the "Utility Trenches" paragraph in PTS Section H10, *Waterfront Structures*.

H5010 1.2 TEMPORARY REMOVAL AND REPLACEMENT

Where necessary or as indicated on RFP drawings provided in Part 6, temporary removal and replacement of utilities and installation of interim facilities may be required to maintain services to existing facilities. Temporary replacement facilities shall match the function and quality of existing facilities.

H501001 POTABLE WATER

Requirements for potable water on pier/wharf are provided below. Additional requirements are provided in the "Potable Water Distribution" paragraph in PTS Section G30, *Site Civil/Mechanical Utilities*.

H501001 1.1 PIPING

Water service lines 100mm and smaller shall be brass pipe, ASTM B43, extra strong. Fittings shall be brass or bronze, FS WW-P-460, 120 psi (825 kPa) minimum. Water lines between 4 inches and 12 inches (100 mm and 300 mm) shall be ductile iron pipe (AWWA C151) or PVC pressure pipe (AWWA 900 DR18). Water lines placed above ground or in a trench shall be flanged ductile iron pipe (AWWA C115). Fittings shall be ductile iron (AWWA C110 or AWWA C153) with rubber sealed gasket joints (AWWA C115). Piping and fittings for ductile iron pipe shall have cement-mortar lining (AWWA C104).

H501001 1.2 VALVES

H501001 1.2.1 Gate Valves

Provide gate valves conforming to AWWA C509, nonrising stem type with flanged ends. Body, bonnet and gate shall be of ductile iron. Valves shall open by counterclockwise rotation of the valve stem. Stuffing boxes shall have O-ring stem seals. Stuffing boxes shall be bolted and constructed so as to permit easy removal of parts for repair. Bronze used in valves shall be Grade A, Grade D or Grade E as specified in AWWA C509. Valves shall have protective epoxy interior coating conforming to AWWA C550.

H501001 1.3 BACKFLOW PREVENTERS

Provide reduced pressure principle type backflow preventers, with epoxy coated and lined ductile iron bodies, replaceable bronze seats, stainless steel internal parts, nonrising stem gate shut-off valves, and suitable for pressures up to 175 psi (1,200 kPa) at 110 degrees F (43 degrees C).

H501001 1.4 PRESSURE REGULATORS

Provide adjustable pressure regulator to reduce incoming water pressure to level specified in the "Portable Water" paragraph of ESR Section H50, *Waterfront Utilities*in Part 3.

H501001 1.5 UTILITY STATION PIPING AND OUTLET

Piping and outlets shall be in accordance with UFC 4-150-02 or as shown in RFP drawings provided in Part 6.

H501002 SALTWATER

Not used.

H501003 SANITARY SEWER

Requirements for sanitary sewer on pier/wharf are provided below. Additional requirements are provided in the "Sanitary Sewer Piping" and "Sanitary Sewer Manholes & Cleanouts" paragraphs in PTS Section G30, *Site Civil/Mechanical Utilities*.

H501003 1.1 PIPING

Piping shall be ductile iron, flanged, conforming to AWWA C115/A21.15, Thickness Class 56. Fittings shall conform to AWWA C110/A21.10 or AWWA C153/A21.53 and shall have a pressure rating at least equivalent to that of the pipe. Pipe and fittings shall have a ceramic epoxy internal lining resistant to chemical attack.

H501003 1.2 VALVES

H501003 1.2.1 Plug Valves

Provide plug valves with cast iron bodies, MSS SP-78. Valves shall be rated for at least 175 psi (1,200 kPa) at 140 degrees F (60 degrees C). Valves and operators shall be designed for outdoor service. Provide valve with internal lining or coating compatible with ship and submarine sewage discharge.

H501003 1.2.2 Check Valves

Provide swing type check valve with flanged ends. Valves shall be designed for outdoor service. Valve materials shall be compatible with ship and submarine sewage discharge.

H501003 1.3 CAMLOCK HOSE COUPLING

Provide camlock hose coupling with stainless steel coupler body, Viton gasket, and twin cam arms with finger rings and stainless steel pins. Coupling shall have a pressure rating of at least 145 psi (1,000 kPa). Provide matching stainless steel plug with stainless steel connecting chain.

H501004 BILGE AND OILY WASTE

H501004 1.1 PIPING

Piping shall be ductile iron, flanged, conforming to AWWA C115/A21.15, Thickness Class 56. Fittings shall conform to AWWA C110/A21.10 or AWWA C153/A21.53 and shall have a pressure rating at least equivalent to that of the pipe. Pipe and fittings shall have a ceramic epoxy internal lining resistant to chemical attack.

H501004 1.2 VALVES

H501004 1.2.1 Plug Valves

Provide plug valves with cast iron bodies, MSS SP-78. Valves shall be rated for at least 175 psi (1,200 kPa) at 140 degrees F (60 degrees

C). Valves and operators shall be designed for outdoor service. Provide valve with internal lining or coating compatible with ship and submarine bilge and oily waste discharge.

H501004 1.3 CAMLOCK HOSE COUPLING

Provide camlock hose coupling with stainless steel coupler body, Viton gasket, and twin cam arms with finger rings and stainless steel pins. Coupling shall have a pressure rating of at least 145 psi (1,000 kPa). Provide matching stainless steel plug with stainless steel connecting chain.

H501005 STEAM

Not used.

H501006 COMPRESSED AIR

Not used.

H501090 OTHER CIVIL/MECHANICAL UTILITIES

Not used.

H501091 MISCELLANEOUS MATERIAL

H501091 1.1 PIPE GUARDRAILS

Provide Schedule 80 pipe guardrails of stainless steel, ASTM A 312/A 312 M, Type 316L, or of galvanized and coated steel, with butt welding fittings of the same material and weight of the piping.

H501091 1.2 PIPE HANGERS AND SUPPORTS

Pipe hangers and supports shall conform with MSS SP-58 and MSS SP-69 and shall be of Type 316 or Type 316L stainless steel or galvanized steel.

H501091 1.3 HARDWARE

Hardware, including bolts, nuts, washers, anchors and screws, shall be of Type 316 stainless steel or galvanized steel.

H501091 1.4 MISCELLANEOUS METAL

Miscellaneous metal shall be standard mill finished structural steel shapes, galvanized ASTM A 36/ASTM A 36M steel, or Type 316L stainless steel.

H5020 ELECTRICAL UTILITIES

H5020 1.1 DUCT/CONDUIT PLACEMENT

Ducts and conduits located on elevated deck shall be embedded in the concrete deck. As an alternative, electrical cables can be contained inside concrete jackets supported below the deck.

H502001 ELECTRICAL POWER DISTRIBUTION

H502001 1.1 ELECTRICAL POWER DISTRIBUTION

Waterfront electrical power distribution systems may include the primary system to the substation and the secondary system that serves electrical power outlet assemblies located on the wharf/pier.

Electrical power distribution shall be in accordance with the requirements of the applicable portion of the "Electrical Distribution" paragraph in PTS Section G40, *Site Electrical Utilities*.

H502001 1.2 ELECTRICAL POWER OUTLET ASSEMBLIES

Refer to the "Utility Mounds" paragraph in PTS Section H10, *Waterfront Structures*, for enclosure for electrical power outlet assembly.

The Designer of Record shall utilize UFGS Section 26 05 33, *Dockside Power Connection Stations*, for work related to waterfront electrical power outlet assemblies. Multiple three phase, three wire power receptacles suitable for the power ratings specified in the "Electrical Power Distribution" paragraph of ESR Section H50, *Waterfront Utilities*in Part 3 shall be provided. These power outlet assemblies shall be served by substations with 3 phase, 3 wire delta secondaries. Each receptacle at the power outlet assembly shall be supplied by a power circuit breaker that is capable of delivering the specified amperes continuously with adequate long time trip rating to allow continuous operation at specified amperes without nuisance tripping. Provide remote controls for each circuit breaker serving share power receptacles. Provide controls for primary and secondary main circuit breakers at the electrical power outlet assemblies served.

Industrial power outlets shall be provided for portable equipment used at pier side. Industrial power outlets shall include 3 phase 4 wire receptacles and 3 wire receptacles for the specified voltages, and 115 volt convenience receptacles. Industrial power outlets shall be served from a substation or transformer with grounded neutral secondary.

H502002 TELECOMMUNICATION

Refer to the "Utility Mounds" paragraph in PTS Section H10, *Waterfront Structures*, for enclosure for telecommunication stations.

Refer to the "Site Communication and Security" paragraph in PTS Section G40, *Site Electrical Utilities*, for requirements for Cable, wiring, ductbanks, manholes and handholes.

H502003 LIGHTING

Refer to the "Site Lighting" paragraph in PTS Section G40, *Site Electrical Utilities*, for requirements for over deck lighting.

Provide lighting fixtures mounted on high mast poles.

Provide a computer model of the illumination system using photometric data prepared for the fixture by an independent testing laboratory. Follow IES standards for preparation of the computer model. Adjust and modify the design to provide the illumination required. The corrosion protection features shall be suitable for the environmental condition at the site.

H502004 LIGHTNING PROTECTION

Lightning protection system shall be catenary wire type that complies with NFPA 780, MIL-HDBk-1004/6, *Lightning Protection*, and NAVSEA OP 5 Chapter 6, Lightning Protection. Protection system shall be design for protection of ordnance that is placed on the pier/wharf. Provide primary and secondary ground wires and means for connecting portable equipment to the grounding system. Material used shall be suitable for the environmental conditions at the site.

H502005 ELECTRICAL POWER CABLE BOOMS FOR BERTHING OF SUBMARINES

Function of the power boom is to support and deliver power cables from the on pier/wharf power outlet assembly to the points of power connection on the berthed submarine. Locations of the power booms and the ranch of operation are as shown on RFP drawings provided in Part 6.

The power boom shall be of galvanized steel construction with proper corrosion protection coating meeting the requirements of UFGS Section 09 97 13.26, *Coating of Steel Waterfront Structure*. Bolts, nuts and washers shall be hot deep galvanized. When the boom is under its stowed position at the pier/wharf or when the boom is positioned to connect the cables to the submarine, the boom shall be secured from unexpected movement in both horizontal and vertical directions. Both horizontal and vertical movements of the boom shall be activated manually with the assistance of power, mechanical or hydraulic device. Safeguard shall be provided to preclude simultaneous movement in different directions and uncontrolled movement while the boom is in motion.

The power cable shall be supported on a cable tray in the boom with means of delivering the cables to the submarine at different locations as shown on RFP drawings provided in Part 6. Use of electrical hoist may be allowed.

All electrical or hydraulic components shall be suitable for outdoor services in marine environment. The rate of movement at the end of the boom shall be limited to 8 feet/minute (2.5 meters/minute). Moving elements that involve metal-to-metal contact shall have friction reduction components (such as Teflon coatings and bronze bushings).

Structural design requirements for the power boom shall be in accordance with PTS Section H10, *Waterfront Structure*.

H502090 OTHER ELECTRICAL UTILITIES

Not used.

H5030 WATERFRONT FIRE PROTECTION

H503001 FIRE PROTECTION WATER

H503002 FIRE ALARM

---End of Section---

SECTION H60

WATERFRONT DEMOLITION
09/15

H60 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

H60 1.1 NARRATIVE

This Section must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation.

This Section includes the requirements for the design and construction of waterfront demolition, described in ESR H60, *Waterfront Demolition*, of Part 3 and as identified on the RFP drawings provided in Part 6.

H60 1.2 WATERFRONT DEMOLITION DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*.

H60 1.2.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-800-10N, *Environmental Engineering for Facility Construction*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS Section 02 83 13.00 20, *Lead In Construction*

H60 1.2.2 General Requirements

H60 1.2.2.1 General Demolition

The work includes demolition, salvage of identified items and materials and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed. Materials that cannot be removed daily shall be stored in areas specified in the Demolition Plan. Remove indicated existing elements of waterfront facilities as identified on drawings provided in Part 6 and as required to be determined by the Contractor.

H60 1.2.2.2 Utilities

Remove existing utilities as identified in ESR H60, *Waterfront Demolition*, and on RFP drawings provided in Part 6 and terminate in a manner conforming to the nationally recognized code covering the specific utility.

H60 1.2.2.3 Dust Control

Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area.

H60 1.2.2.4 Traffic Control

Where pedestrian and vehicle safety is endangered, use traffic barricades.

H60 1.2.2.5 Burning

Burning will not be permitted.

H60 1.2.2.6 Lead Based Paint

Refer to the "Lead Based Paint" paragraph in PTS Section F20, *Selective Building Demolition*.

H60 1.2.2.7 Mercury and Low Level Radioactive (LLR) Component

Refer to the "Mercury and LLR Components" paragraph in PTS Section F20.

H60 1.2.2.8 PCB's

Refer to the "PCB's" paragraph in PTS Section F20, *Selective Building Demolition*.

H60 1.2.2.9 Ozone Depleting Substance (ODS)

Refer to the "ODS" paragraph in PTS Section F20, *Selective Building Demolition*.

H60 1.2.2.10 Salvage Material

All demolished material will become the property of the Contractor except for the salvage items identified in ESR H60, *Waterfront Demolition*, in Part 3. Salvage items will become the property of the Government.

H60 1.2.2.11 Permit and Environmental Control

Waterfront demolition work shall meet the permit and environmental control requirements of Section 01 57 19.00 20, *Temporary Environmental Controls for Design-Build*, in Part 2. In-water and over-water demolition shall not commence until the required USACOE permits are obtained and shall meet the conditions stipulated in the USACOE permits.

H60 1.3 QUALITY ASSURANCE

Qualifications, certifications, and Test Plans indicated herein shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

The Designer of Record is responsible for approving the submittals listed below.

H60 1.4 DESIGN SUBMITTALS

Design submittals shall be in accordance with PTS Section Z10, *General Performance Technical Specification*, 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine Corps Design Procedures*, UFC 3-800-10N, *Environmental Engineering for Facility Construction*.

H60 1.5 CONSTRUCTION SUBMITTALS

The general requirements of this PTS Section are located in PTS Section Z10, *General Performance Technical Specification*. Construction submittals shall be in accordance with 01 33 00.05 20, *Construction Submittal Procedures*.

H6010 IN-WATER OR OVER-WATER DEMOLITION

Demolition of in-water or over-water substructure, superstructure, deck and coastal protection components identified on the RFP drawings provided in Part 6 or as required based on the Contractor's design shall be performed meeting the permit and environmental control requirements specified above.

H6020 NON-IN-WATER OR NON-OVER-WATER WATERFRONT DEMOLITION

For non-in-water or non-over-water waterfront demolition, refer to PTS Section F20, *Selective Building Demolition*.

H6030 HAZARDOUS COMPONENTS ABATEMENT

Refer to the "Hazardous Components Abatement" paragraph in Section F20, *Selective Building Demolition*.

---End of Section---

SECTION Z10

GENERAL PERFORMANCE TECHNICAL SPECIFICATION
09/15

Z10 GENERAL

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

Z10 1.1 NARRATIVE

All Performance Technical Specification (PTS) sections must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation. This PTS section provides general requirements for the other PTS sections of this RFP and is used in conjunction with the other PTS sections.

Refer to UFGS section 01 33 10.05 20, *Design Submittal Procedures*for the Order of Precedence of the RFP Parts. Requirements listed in the Project Program take precedence over the PTS sections requirements; therefore, requirements identified in the Project Program eliminate options related to that requirement in the PTS sections.

Z10 1.2 DESIGN GUIDANCE

Provide work in compliance with the following design standards and codes, as a minimum. Government standards listed in this RFP take precedence over industry standards.

The PTS Sections reference published standards, the titles of which can be found in the *Unified Master Reference List (UMRL)*on the Whole Building Design Guide at the Unified Facilities Guide Specification (UFGS) Website . The publications referenced form a part of this specification to the extent referenced. The publications are referred to in the section text by the basic designation only. Industry standards, codes, and Government standards referenced in the section text, and not found in the UMRL, are listed at the beginning of the PTS sections.

The advisory provisions of all referenced codes, standards, and specifications must be mandatory; substitute words such as "must", or "required" for words such as "should", "may", or "recommended," wherever they appear. The results of these wording substitutions incorporate these code and standard statements as requirements. Reference to the "authority having jurisdiction" for variance from criteria shall be interpreted to mean the "Chief Engineer, NAVFAC" and for contractual obligations on this project shall be interpreted to mean the "Contracting Officer". Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

The following list of codes and standards is not comprehensive and is

augmented by other codes and standards referenced and cross-referenced in the RFP.

Z10 1.2.1 INDUSTRY CODES

INTERNATIONAL BUILDING CODE (IBC) as modified by UFC 1-200-01. UFC 1-200-01 applies the IBC to the project and references other commercial standards and UFC criteria that become part of the contract.

Z10 1.2.2 INDUSTRY REQUIREMENTS

WHOLE BUILDING DESIGN GUIDE (WBDG)

WHOLE BUILDING DESIGN GUIDE, Ensure Occupant Safety and Health (Systems Safety Engineering) at http://www.wbdg.org/design/ensure_health.php

Z10 1.2.3 GOVERNMENT STANDARDS

Z10 1.2.3.1 UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01	General Building Requirements(UFC 1-200-01 is a hub document that provides general building requirements and references other critical UFCs. A reference to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs. A complete list of these Tri-Service Core UFCs is located in UFGS section 01 33 10.05 20)
UFC 1-200-02	High Performance and Sustainable Buildings
FC 1-300-09N	Navy and Marine Corps Design Procedures

Z10 1.2.3.2 FEDERAL STANDARDS

Architectural Barriers Act Accessibility Standard with DEPSECDEF Memorandum 31 Oct 2008, "Access for People with Disabilities"

Occupational Safety and Health Association (OSHA)

Z10 1.3 MATERIALS AND EQUIPMENT REQUIREMENTS IDENTIFICATION

Z10 1.3.1 MATERIALS STANDARD

Refer to the Project Program for identification of Government Furnished Equipment.

The equipment items shall be supported by service organizations that

are convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

Materials, equipment, fixtures, and other appurtenances shall comply with applicable Underwriters Laboratories, (UL) Inc., American National Standards Institute, Inc., and National Electrical Manufacturer's Association standards or applicable standards of a similar independent testing organization. All materials shall be new, and shall bear the label of Underwriters Laboratories whenever standards have been established and label service is normally and regularly furnished by the agency. All equipment provided shall be listed and labeled suitable for the specified purpose, environment, and application and installed in accordance with manufacturer’s recommendations. Insulation shall be asbestos free.

Z10 1.3.2 EQUIPMENT NAMEPLATE IDENTIFICATION

Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.

Z10 1.3.3 FIELD-APPLIED NAMEPLATES

Provide laminated plastic nameplates for each piece of equipment. Each nameplate must identify the function and, when applicable, the number designation of that piece of equipment as used in the design documents. Provide melamine plastic nameplates, 0.125 inch (3 mm) thick, white with black center core.

Z10 1.4 COMMISSIONING

Commission the building systems identified in the Project Program paragraph 2.2.3. Refer to UFGS section 01 45 00.05 20, *Design and Construction Quality Control*for commissioning requirements. Test reports must be certified by the Commissioning Authority (CA), that work is in compliance with requirements of the RFP.

Z10 1.5 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTS

Verification of satisfactory construction and system performance shall be via Performance Verification Testing, Acceptance Tests, and submittal of test reports certified by the Designer of Record (DOR), that work is in compliance with requirements of the RFP. The Government reserves the right to witness all Performance Verification and Acceptance Tests, review data, and request other such additional inspections and repeat tests as necessary to ensure that the work and provided services conform to the stated requirements. Contractor shall pay the cost of all testing.

Refer to each PTS section to identify Performance Verification and Acceptance Testing required by the work specified in that PTS section.

Z10 1.6 SUBMITTALS

Contractor's design submittals that combines design and construction

submittals, must jointly comply with UFGS sections 01 33 00.05 20, *Construction Submittal Procedures*and 01 33 10.05 20, *Design Submittal Procedures*. Contractor's construction submittals that are submitted separate from the design submittals must comply with UFGS 01 33 00.05 20, *Construction Submittal Procedures*.

Refer to “"Construction Quality Control" in UFGS 01 33 00.05 20, *Construction Submittal Procedures*and 01 45 00.05 20, *Design and Construction Quality Control*to define reviewing and approving Authority of design and construction submittals.

Utilize the same materials and equipment that are approved and provided for an initial facility design, on all follow-on facilities that use the same design with-in this contract. Once the initial facility design is approved by the Government, the Contractor must obtain Government approval to change materials and equipment when designing and constructing follow-on facilities utilizing the same design.

Z10 1.6.1 DESIGN SUBMITTALS

Design submittals shall be in accordance with Unified Facility Guide Specification (UFGS) section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine CorpsDesign Procedures*, and other discipline-specific guidelines listed in the applicable PTS sections.

UFGS Section 01 33 10.05 20, *Design Submittal Procedures*requires the use of UFGS sections in the development of the contractor originated specification. The Designer of Record (DOR) shall edit the UFGS sections for the project and submit the edited specification as a part of the design submittal. The DOR shall edit the UFGS as follows:

(1) Prepare UFGS Specifications as part of the project specification,

(2) Delete only portions of the UFGS specification that are not applicable to the project,

(3) Edit only the bracketed choices that are within the UFGS specification text,

(4) Edit blank bracketed options to include requirements that exercise prudence and adherence to acceptable industry standards,

(5) Comply with the directions, directives, and requirements of all UFGS Criteria Notes. The UFGS Criteria Notes are typically bordered on the top and bottom by a line of asterisks to highlight their location.

(6) If proprietary information is provided or required to streamline the construction submittal process, include proprietary information in the edited UFGS sections and added to the end of each UFGS section. Confirm that the proprietary products, materials, and systems listed in the specifications are in compliance with the requirements of the RFP.

Z10 1.6.2 CONSTRUCTION SUBMITTALS

Submit for approval to the Designer of Record (DOR), construction submittals, product data, manufacturer's information, shop drawings, and test reports on all materials and systems installed in the project, unless the DOR designates submittal for QC approval. Refer to each PTS section for further construction submittal requirements relating to the work identified in that particular PTS section. Some PTS sections reference UFGS sections that will require more construction submittals for DOR approval than is stated above. Refer to Section 01 33 00.05 20 for the list of construction submittals reserved for Government Approval and Government Surveillance.

--End of Section--

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PART 5 – PRESCRIPTIVE TECHNICAL SPECIFICATIONS (NOT USED)

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PART 6 – ATTACHMENTS (BY OTHERS)