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DOCUMENT 00 01 15

LIST OF DRAWINGS
02/11

PART 1 GENERAL

1.1 SUMMARY

This Section lists the drawings for the project pursuant to Contract Clause "DFARS 252.236-7001, Contract Drawings, Maps and Specifications."

1.2 CONTRACT DRAWINGS

Contract drawings are as follows:

LIST OF DRAWINGS - PERIMETER SECURITY ROAD REPAIRS

DRAWING NO.	NAVFAC DWG NO.	PWD ME DWG NO.	TITLE
G-001	12916775		TITLE SHEET
G-001A	12916776		LIST OF DRAWINGS
G-002	12916777		KEY PLAN
G-003	12916778		GENERAL NOTES
G-004	12916779		GENERAL NOTES
G-005	12916780		GENERAL CONSTRUCTION FENCE DETAILS AND NOTES
V-101	12916781		AREA G - EXISTING CONDITIONS - PLAN 1
V-102	12916782		AREA G - EXISTING CONDITIONS - PLAN 2
V-103	12916783		AREA G - EXISTING CONDITIONS - PLAN 3
V-104	12916784		AREA G - EXISTING CONDITIONS - PLAN 4
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CEC001	12916787		EROSION CONTROL NOTES
CEC002	12916788		EROSION CONTROL DETAIL 1
CEC003	12916789		EROSION CONTROL DETAIL 2
CEC101	12916790		AREA G - WORK AREA ONE EROSION CONTROL PLAN
CEC102	12916791		AREA G - WORK AREA TWO EROSION CONTROL PLAN
CEC103	12916792		AREA G - WORK AREA THREE EROSION CONTROL - PLAN 1
CEC104	12916793		AREA G - WORK AREA THREE EROSION CONTROL - PLAN 2
CEC105	12916794		AREA G - WORK AREA FOUR EROSION CONTROL PLAN
CEC106	12916795		AREA G - WORK AREA FIVE EROSION CONTROL - PLAN 1
CEC107	12916796		AREA G - WORK AREA FIVE EROSION CONTROL - PLAN 2
CEC108	12916797		AREA G - WORK AREA SIX EROSION CONTROL PLAN
CEC109	12916798		AREA G - WORK AREA SEVEN EROSION CONTROL - PLAN 1
CEC110	12916799		AREA G - WORK AREA SEVEN EROSION CONTROL - PLAN 2
CEC111	12916800		AREA H - WORK AREA ONE EROSION CONTROL PLAN
CEC112	12916801		AREA H - WORK AREA TWO EROSION CONTROL

		- PLAN 1
CEC113	12916802	AREA H - WORK AREA TWO EROSION CONTROL - PLAN 2
CEC114	12916803	AREA H - WORK AREA THREE EROSION CONTROL PLAN
C-101	12916804	LAYDOWN PLAN
C-102	12916805	AREA G - PLAN 1
C-103	12916806	AREA G - PLAN 2
C-104	12916807	AREA G - PLAN 3
C-105	12916808	AREA G - PLAN 4
C-106	12916809	AREA H - PLAN 1
C-107	12916810	AREA H - PLAN 2
C-201	12916811	AREA G - PROFILE 1
C-202	12916812	AREA G - PROFILE 2
C-203	12916813	AREA G - PROFILE 3
C-204	12916814	AREA G - PROFILE 4
C-205	12916815	AREA G - PROFILE 5
C-206	12916816	AREA G - PROFILE 6
C-207	12916817	AREA H - PROFILE
C-301	12916818	AREA G - TYPICAL SECTIONS
C-302	12916819	AREA H - TYPICAL SECTIONS
C-303	12916820	AREA G - CROSS SECTIONS 1
C-304	12916821	AREA G - CROSS SECTIONS 2
C-305	12916822	AREA G - CROSS SECTIONS 3
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-- End of Document --

SECTION 01 11 00.00 20

SUMMARY OF WORK (PWD ME)
05/21

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals; G

Work Sequencing, Phasing, and Preparation Plan; G

Salvage Plan; G

1.2 WORK COVERED BY CONTRACT DOCUMENTS

1.2.1 Project Description

The work includes the following and incidental related work:

Base Bid Scope of Work includes:

a. Constructing laydown area to store materials and equipment.

b. Providing payment to regulating authorites for In-Lieu Fee.

c. Raising and widening of exisitng gravel road at work Area G. Constructing stone revetment slope on ocean side of roadway. The revetment construction will require portions of the Ground Grid to be temporarily cut such that additional length can be added and the grounding wire be lowered in the ground prior to installation of revetment. The grounding wire is to be repaired via exothermic weld. See Specification 01 14 00.00 20 Attachment A for grounding grid work requirements.Installation of several drainage features including a new open bottom box culvert. The open bottom box culvert requires the final design to be provided by the manufacturer.

d. Raising and widening of exisitng gravel road at work Area H. Constructing stone revetment slope on ocean side of roadway. The revetment construction will require portions of the Ground Grid to be temporarily cut such that additional length can be added and the grounding wire be lowered in the ground prior to installation of revetment. The grounding wire is to be repaired via exothermic weld. See Specification 01 14 00.00 20 Attachment A for grounding grid work requirements. Installation of several drainage features including a new open bottom box culvert. The open bottom box culvert requires the final design to be provided by the manufacturer.

e. Incidental related work.

Project Options include:

Option 1: Roadway safety improvements at Vicker's corner. Improvements include: regrading the roadway, new pavement, guardrail, striping, signage as well as other incidental related work.

Option 2: The removal and replacement of two (2) existing roadway culverts on ridge road. Mill and overlay of approximately 2,800 lf of roadway between B103 and B100. Provide crack seal after mill prior to overlay. Work must be sequenced such that the culverts are replaced prior to the mill and overlay.

Option 3: 2,000 Tons of pavement to be placed along contiguous sections of roadway along the perimeter security roads.

1.2.2 Project Sequencing Requirements

Provide Work Sequencing, Phasing, and Preparation Plan indicating how the work is to be accomplished and incorporating Government directives. The intent of this Plan is to show the Government that a complete understanding of the project requirements are understood including subcontractors. The Plan must be carefully prepared and must include every aspect of the project including outages that will be required to support the construction and how it is to be accomplished with an absolute minimum of disruption to Government operations. No work may begin on the project until this plan is reviewed and approved by the Contracting Officer.

The following restrictions apply to the sequencing of the work:

a. Existing equipment to remain in construction areas (e.g. Helix House equipment, etc.) must be protected from dust, debris, demolition, and construction activities to ensure the items are not damaged and are useable at project completion.

b. The building will be occupied by Government personnel adjacent to work areas during the project.

c. Buildings 101 and 102 are historic facilities and require special coordination to have limited impact on the historic fabric and character defining features of the structures. Work must comply with the SECRETARY OF THE INTERIOR'S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES.

1.2.3 Location

The work is located at the NCTAMS LANT DET CUTLER, Cutler, Maine, approximately as indicated. The exact location will be shown by the Contracting Officer.

1.3 PROJECT ENVIRONMENTAL GOALS

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 project that meets the functional program needs and incorporates sustainability principles. Specifically:

a. 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. 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.

e. Manage construction site and storage of materials to ensure no negative impact on the indoor environmental quality of the building.

f. Reduce construction waste through reuse, recycling, and supplier take-back.

1.4 OCCUPANCY OF PREMISES

Adjacent facilities and buildings will be occupied during performance of work under this Contract.

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, parking, building entrances and exits, and emergency response vehicle access.

1.5 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 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.

1.6 LOCATION OF UNDERGROUND UTILITIES

Verify location of underground utilities in accordance with Section 01 35 26.00 22 GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME).

1.6.1 Notification Prior to Excavation

Ground disturbing activities and excavation work are not anticipated for this project and must occur without prior approval of the Contracting Officer. If required and approved, notify the Contracting Officer at least 48 hours prior to starting excavation work. Refer to Section 01 35 26.00 22 GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME) for Dig Safe requirements.

1.7 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 2 miles of the construction site.

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.

1.8 BENEFICIAL OCCUPANCY

The Contractor must submit the Certificate of Beneficial Occupancy Acceptance Checklist with the required documentation no later than ten (10) working days prior to requesting the Government take Beneficial Occupancy. This checklist will be provided to the Contractor by the Contracting Officer.

The Contractor is responsible for ensuring all work noted on this form is complete and accepted by the Contractor's QC Manager prior to submitting the form to the NAVFAC PWD ME Construction Manager for NAVFAC PWD ME signatures. Failure of the Contractor to verify all work and provide the required documentation will delay the processing of acceptance of Beneficial Occupancy.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00.00 20

WORK RESTRICTIONS (PWD ME) (AOR)
01/22

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.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2019) Standard for Safeguarding Construction, Alteration, and Demolition Operations

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of Contact Personnel; G

Vehicle List; G

Outage Plan; G

1.3 SPECIAL SCHEDULING REQUIREMENTS

a. During the implementation of the project, if differing site conditions are encountered that generate an RFI which requires technical review by the DOR and the Government for the electrical design, a minimum of 7 working days will be required to provide the vetted response. The Contractor must include this requirement in his/her project schedule.

b. The VLF Facility site will remain in operation during the entire construction period. The Contractor must conduct his/her operations so as to cause the least possible interference with normal operations of the Activity.

c. During the entire construction period for this project, other construction projects and maintenance activities will be occurring within and around the Helix Houses and on the Activity. The Contractor must coordinate the work of this contract with the other projects and maintenance activities.

d. Permission to interrupt any Activity roads and/or utility services must be submitted to the Contracting Officer in writing a minimum of 15 calendar days prior to the desired date of interruption. The Outage process (Instruction 11300.9) is used for this purpose, as discussed under UTILITY CUTOVERS AND INTERRUPTIONS. A minimum of 21 days (3 weeks) is required for outages that will directly affect the mission. These outages must be on Monday maintenance days between 0800 and 1400. Any mission outages outside of these hours must be identified on the project schedule for long term coordination.

e. Coordinate the work with the sequencing/phasing requirements outlined in Section 01 11 00.00 20 SUMMARY OF WORK (PWD ME). The project must be sequenced to limit power and communication outages to the periods of time as indicated and as directed.

f. Have materials, equipment, and personnel required to perform the work at the site prior to the commencement of the work. Specific items of work to which this requirement applies include:

(1) Environmental protection components.

(2) Work within bunkers, manholes, culverts, and tunnels.

g. The work under this contract requires special attention to the scheduling and conduct of the work in connection with existing operations.

Identify on the construction schedule each factor which constitutes a potential interruption to operations.

The following conditions apply:

(1) VLF signal transmission operations.

(2) Work within bunkers, manholes, and tunnels will be subject to increased restriction. Work in these areas will be allowed for approximately one 6.5-hour period (8:00am to 2:30pm), once each week, during scheduled 'down days'. Down days may be cancelled or extended as directed by the Contracting Officer.

(3) Coordination with Activity operations.

(4) Coordination with other construction and maintenance projects on the Activity.

k. Removal operations must not commence until the specified work plans and environmental protection plan have been approved by the Contracting Officer.

1.4 CONTRACTOR ACCESS AND USE OF PREMISES

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations. Keep within the limits of the work and avenues of ingress and egress. Do not enter restricted areas unless required to do so and until cleared for such entry.

All Contractors' equipment must be conspicuously marked with company signage for identification.

1.4.1 Subcontractors and Personnel Contacts

Furnish 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.

1.4.2 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 Base pass expiration date (if applicable).

1.4.3 Identification Badges and Installation Access (NCTS Cutler)

a. Submit to John Watson and Seth Maker via email (email addresses below) a list of names of those Contractor personnel who require access to the Facility, along with the company each person directly works for, the buildings/locations on the Facility where each person will be working, and the project title. The Contractor is required to identify the start and end date of their request. Each request can cover up to a year.

Maker, Seth R CIV NAVFAC MIDLANT, PWD Maine (mail to: Seth.maker.civ@us.navy.mil)
Seth Maker, EIT
Construction Manager (CM)
NAVFAC MIDLANT, PWD Maine
Cutler Field Office
O: 207-259-8301
C: 207-317-2674

Watson, John V CIV NAVFAC MIDLANT, PWD Maine (mail to: john.watson6.civ@us.navy.mil)
John V. Watson
Engineering Technician (ET) Construction
NAVFAC MIDLANT, PWD Maine
Cutler Field Office
C: 207-341-1136

b. For each company working under this Contract, identify a Point of Contact (POC) so the Cutler Facility Office and Base Security know who to reach out to for access issues. Only identify the POC the first time Base access is requested.

c. Once the list of employees requesting access is received, the Cutler Field Office will push it through the NCTAMS DET Cutler access coordinator (Pat Perry), Base Security, and Mission Security. Once

the list has been forwarded to the applicable parties, the Contractor will be notified.

d. Once the Contractor has confirmation the list has been sent to Base Security, the Contractor can send the 5512-1 form via email to Security Officers Mike Fullmer and Steve Albee. Their email addresses are below:

stephen.r.albee.civ@us.navy.mil

michael.r.fullmer.civ@us.navy.mil

e. When Contractor employees arrive at the main gate and Pass Office, they must have appropriate ID and check in for a base access badge at the main gate and also a mission access badge at Building 100. The list of ID requirements is on page 3 of the access form. If a drivers license indicates “not for Federal use” or something similar on it, it cannot be used as a form of ID.

f. See below for additional information.

Contractor must submit the company name, names of employee's, date of birth, place of birth and contracted period of performance using SECNAV Form 5512-1 (May 2021) (Attachment A) a minimum of 7 working days in advance for vetting and approval as described above. The employees will be placed on an access list for the duration of the contract as requested for up to 365 days. At the end of that time period the Contractor must resubmit access request information. The Contractor must follow this procedure each year for the duration of the contract. A picture ID (i.e., driver's license) will be required to enter the facility. Driver's licenses must be "Real ID" compliant. Refer to OPNAVINST 5530.14E Chapter 12, Table 12-2, for a list of acceptable forms of ID for Base access (refer to Attachment A). All vehicles are required to have current registration, inspection and insurance. For concerns regarding access contact the Base Police at 207-259-8267.

1.4.4 Contractor Daily Check-In

Contractors must report to the NCTAMS LANT DET CUTLER Administration Office for check-in and issue of a building/facility access badge before proceeding to their work site. The contractor must return the access badge to the NCTAMS LANT DET Cutler Administration Office once their work is completed. For contractors that will be working onboard NCTAMS LANT DET Cutler for periods longer than one week, an inventory of the company's employee's access badges must be verified with the NCTAMS LANT DET Cutler Administration Office by COB every Monday.

1.5 ACTIVITY REGULATIONS

1.5.1 Radiological

1.5.1.1 Radioactive Sources

All contracts involving radiation generating devices must conform to the requirements listed in Section 01 35 26.00 22 GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME) and U.S. Army Corps of Engineers Safety Manual EM 385-1-1. All requirements are to be submitted to the Contracting Officer at least 14 days prior to commencement of operations involving radiation generating devices. A requirements checklist will be provided

by NAVFAC (COTs) Contractor Oversight Technician and also available on PWD Maine website:

https://www.navfac.navy.mil/navfac_worldwide/atlantic/fecs/mid-atlantic/pwd_maine/about_us/construction.html

1.5.2 Laser Control

Contractor must comply with laser safety requirements under 21 CFR 1040 and ANSI 2136.1-1986 for any work under this contract utilizing lasers.

1.5.3 Energy Conservation

In cooperation with Government representatives, the Contractor must participate in an active program directed toward the efficient use of energy. Government furnished utilities will not be provided for air conditioning of Contractor trailers or office areas.

1.5.4 Fire Prevention

Contractor must familiarize and require all their employees to become familiar with fire prevention regulations within the Station to include the proper method of turning in a fire alarm, storage of flammable and combustible materials and control of combustible waste and trash. Any HOT WORK (welding, burning, grinding, cutting, etc.) requires a HOT WORK PERMIT prior to commencing such work. This permit is obtained from the Activity's Fire Department via the Contracting Officer.

1.5.5 Pesticide and Herbicide Control

Contractor must not apply pesticides nor herbicides unless specifically required by this contract. Where application of pesticides or herbicides is required, provide the submittals required by the specification and obtain written approval prior to any application. Contracting Officer will require review and approval of pesticides or herbicides submittals.

1.5.6 Smoking Policy

In accordance with NAVFAC policy, smoking is prohibited inside all buildings and other facilities except those areas specifically identified as smoking areas (e.g., smoking shelters). Smoking is not permitted within 20 feet of air intakes, doorways or windows.

1.6 WORKING HOURS

Regular working hours must consist of a period established by the Contracting Officer between 7 AM and 3:30 PM, Monday through Friday, excluding Government holidays. The regular working hours must be confirmed with the Contracting Officer.

1.6.1 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Provide written requests fifteen (15) Calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress and to allow scheduling full time escorts for the building(s) if required. During periods of darkness, the different parts of the work must be lighted in a manner approved by the Contracting Officer.

As part of the requests, provide the specific dates, hours, location(s), type(s) of work to be performed, Contract number, and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours.

Working on Weekends: Any request to work on a weekend must be submitted to the Contracting Officer no later than two (2) working days prior to the requested work weekend.

1.7 WORK IN OCCUPIED BUILDING(S)

Work under this contract may be located in an occupied building. Move unfixed furniture away from Contractor's working area as required to perform the work; protect; and replace in original locations upon completion of the work. Leave fixed equipment in place and protect against damage or temporarily disconnect, relocate, protect, and reinstall at completion of work. If determined necessary by the Contracting Officer, the Government will remove and relocate other Government property in the areas of the buildings scheduled to receive work. Allow 15 calendar days after written notification from the Contractor for the Government to relocate Government property.

1.8 UTILITY CUTOVERS AND INTERRUPTIONS

Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays unless noted otherwise as approved by the Contracting Officer. Conform to procedures required in the paragraph "Work Outside Regular Hours." Utility Cutovers and Interruptions that affect the mission must be scheduled for Monday maintenance days. Anticipated costs must be included in the bid.

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

Interruption to Water, Sanitary Sewer, Storm Sewer, Telephone Service, Electric Service, Air Conditioning, Heating, Fire Alarm, Compressed Air, and other utilities must be considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours." This time limit includes time for deactivation and reactivation.

Operation of Station Utilities: The Contractor must not operate nor disturb the setting of control devices in the Station's 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 in writing within 15 calendar days when such operation is required.

Any Outage requests denied due to incomplete information required to support the requested outages, will not be justification for a delay claim. The Contractor must review any planned outage with the NAVFAC Construction Management Team prior to submitting a outage request to ensure the necessary information is included with the request to avoid any delays.

Submit an Outage Plan as indicated.

1.9 GENERAL RESTRICTIONS

(1) Exterior work must not be performed when the wind velocity exceeds

35 mph measured at 30 feet above the ground or when thunderstorms or any other violent weather and/or winds of 50 mph or more are predicted. The Contractor must verify wind speed and weather conditions.

(2) Work will be prohibited any time that operational commitments dictate as directed by the Contracting Officer.

(3) Contractor personnel must not perform any work unless they have the following minimum equipment:

a. Hard hats
b. Long pants
c. Gloves.
d. Safety shoes
e. Safety glasses
f. Portable radios
g. Appropriate class reflective vests
h. Fall protection
i. Hearing protection
j. Reflective Foul Weather Gear when needed

(4) The klaxon for the north or south must be checked before working in the arrays.

(5) Contractor personnel must assure that the de-ice breakers located at the Power Plant are locked out.

(6) Work areas must be kept clear of all debris.

(7) Osprey nests, if encountered, must not be disturbed. The Contractor must notify the Contracting Officer. Osprey nests must be relocated by the Government only between September 1 and April 15.

1.10 SPECIFIC RESTRICTIONS

a. Work required by this project and specific procedures and outages must be closely coordinated and approved by the Contracting Officer and NCTAMS personnel.

1.11 FIRE PROTECTION

1.11.1 Compliance

The Contractor must comply with COE EM 385-1-1, NFPA 241, Utility and Facility Outages, and Activity's fire regulations. Obtain approval from the Activity's Fire Chief via the Contracting Officer prior to commencement of hot work operations.

1.11.2 Notification of Fire

Post Activity's fire poster in conspicuous locations and at telephones in Contractor trailers.

1.11.3 Fire Protection

Any contractors working around, inside, or on the roof of any NCTAMS Lant Det Cutler VLF operational buildings, towers or fuel tanks, must move all

equipment including JLG lifts, vehicles, generators and any other construction project support equipment a minimum of 100 feet away from these structures at the conclusion of each work day.

1.12 SECURITY REQUIREMENTS

1.12.1 General

Contractor employees and representatives performing work under this contract are required to be United States citizens. If naturalized, the individual must present his naturalization papers to the Security Officer for inspection. Foreign born personnel must present evidence of citizenship regardless of citizenship of parents, as required by immigration laws.

1.12.2 Application and Issue of Security Badges

Refer to paragraph entitled IDENTIFICATION BADGES AND INSTALLATION ACCESS. A "Real ID" compliant picture ID is required in addition to satisfactory proof of citizenship. See Attachment A. Comply with NCTAMS Rules and Procedures for access to secured spaces as coordinated with and as directed by the CM/ET. Provide a minimum of five (5) working days advance notice to the CM/ET the location(s) of required access, when access is needed, how long access is required, and the names of those to access the space(s).

"Permanent" (photo) Standard Access Control Badges will be issued to Contractor personnel requiring access for three (3) or more work days. Contractor personnel will be required to complete an authorization application form for local record check, and a personal information sheet. The forms will be furnished to the Contractor following award of any contract resulting from this solicitation, at time of pre-performance or pre-construction conference.

In the event the Contractor requires access to contract work areas not permitted by the level of security badge issued, such need must be demonstrated and an escort obtained. The escort must remain visible to the Contractor at all times within areas requiring escort.

STANDARD ACCESS CONTROL BADGES MUST BE ATTACHED TO THE OUTER GARMENT AND DISPLAYED AT ALL TIMES WHILE ON THE ACTIVITY.

CONTRACTOR PERSONNEL MUST NOT ENTER AREAS FOR WHICH THEY HAVE NOT BEEN CLEARED. WHERE A NEED HAS BEEN DEMONSTRATED TO ENTER SUCH AREAS, CONTRACTOR MUST BE UNDER CONSTANT ESCORT BY PERSONNEL WHO HAVE BEEN CLEARED. FAILURE TO ADHERE TO POSTED SECURITY REQUIREMENTS MAY RESULT IN REMOVAL OF THE EMPLOYEE FROM THE ACTIVITY WITH FUTURE ACCESS DENIED.

1.12.3 Application and Issue of Crane Passes

Comply with EM 385-1-1.

1.12.4 Return of Badges and Vehicle Passes

Contractor must ensure all vehicle access permits and personnel badges are returned to the Security Officer when the need has ended. Contractor must account in writing for each missing pass or badge prior to final payment being made on the contract.

1.12.5 Contractor Security Responsibilities

Contractor employees must not transport, drink, or have in their possession any alcoholic beverages. Possession of any controlled substances without a physician's prescription is also prohibited. Any Contractor employee appearing to be under the influence of intoxicating liquor or narcotics will be apprehended by Activity Police, escorted off of the Activity, and turned over to the local Police Department.

Any vehicle found to contain federally controlled substances, including marijuana and products containing CBD including usable residue, may be seized and impounded. Within 24 hours of the work day following any vehicle seizure, the Activity Police will have determined whether forfeiture of the vehicle is required. If not, the vehicle will be returned to the owner or authorized agent. If the vehicle is determined to be appropriate for forfeiture, the Activity's Legal Officer will notify the Drug Enforcement Administration of such seizure and impoundment, for initiation of forfeiture proceedings pursuant to Title 2l, U.S. Code, Section 88l. Such actions may be taken regardless of whether the owner/operator of the vehicle had knowledge of the presence of drugs in the vehicle. The Government may pursue criminal or other disciplinary actions pursuant to Title l8, U.S. Code, Section l382.

Possession of firearms, ammunition and/or explosives is prohibited. In the event explosives are required for construction work, specific handling requirements and approvals must be obtained from the Security Officer via the Contracting Officer.

Cameras, video equipment, or similar photographic equipment must not be introduced into nor removed from the Activity. In the event such equipment is required for performance of contract work, approvals must be obtained from the Security Officer via the Contracting Officer.

Laptop computers must not be introduced into nor removed from the Activity. If laptop computers are required to perform work, obtain approvals from the Security Officer via the Contracting Officer.

Driver use of a hand-held cellular phone in a moving vehicle on the Activity is prohibited. This prohibition does not include hands-free cellular phone devices. Hands-free devices include console/dash-mounted or otherwise secured cellular phones with integrated features such as voice-activation, speed dial, speakerphone or other similar technology for sending and receiving calls.

Driver use of any portable, personal listening device worn inside the aural canal, around or covering the driver's ear while operating a motor vehicle is prohibited. Listening devices include wired or wireless earphones and headphones (including blue tooth or similar technology), and do not include hearing aids or devices designed and required for hearing protection.

The use of radar or laser detection devices to indicate the presence of speed recording instruments or to transmit simulated erroneous speeds is prohibited in accordance with OPNAVINST 5100.2H.

The Contractor must indoctrinate personnel on access limitations to ensure security control is maintained as an integral part of their work pattern and habit.

Contractor must indoctrinate his/her personnel on escorting procedures and responsibilities. Contractor personnel acting as escorts for other Contractor personnel assume full responsibility for their actions. Escorts must be within sight of the persons being escorted at all times.

Contractor is advised that any unescorted personnel found in security areas requiring a higher level clearance than the level represented by the badge displayed will be removed from the area with possible confiscation of security badges and vehicle passes.

1.12.6 Access to Unclassified Information

Access to U.S. Navy technical information manuals, documents, drawings, plans, specifications, and other information (e.g., photos, presentations, renderings, papers, etc.) is government property and restricted to an official need-to-know basis. 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.

1.12.7 Disclosure of Information

a. The Contractor must not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., hard copies, computer files, film, tape, document), pertaining to any part of this contract or any program related to this contract, unless the Contracting Officer has given prior written approval.

b. Requests for approval under paragraph (a) must identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor must submit its request to the Contracting Officer at least 10 business days before the proposed date for release.

c. The Contractor agrees to include a similar requirement, including this paragraph (c), in each subcontract under this contract. Subcontractors must submit requests for authorization to release through the prime contractor to the Contracting Officer.

1.13 CONSTRUCTION VEHICLES

The Contractor must not utilize any vehicle that will exceed an HS20 wheel load. The use of "off road", "utility", or "ATV" vehicles which cannot be legally operated on State roadways or highways is prohibited.

1.14 EMPLOYEE PARKING

Employees must park privately owned vehicles as directed by the Contracting Officer. Employee parking must not interfere with existing and established parking requirements of the Activity.

1.15 GROUNDING GRID LOCATING, INSPECTION, AND REPAIR

A buried grounding grid consisting of bare copper wire exists throughout the NCTAMS LANT DET Cutler site approximately 3- to 12-inches below grade. The existing grid wires are connected together via exothermic welds (Cadwell). Prior to excavating, the grounding grid must be located and documented. Every effort must be made not to damage the existing grounding grid. Where the existing grounding grid is damaged, it must be repaired as indicated and as directed by the Contracting Officer. Prior

to the repairs, a Government Representative must be present to witness the repairs. The locations of the repairs must be documented and included in the as-built record drawings.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 20 00.00 22

PRICE AND PAYMENT PROCEDURES (PWD ME)
05/22

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	(2016) 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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Schedule of Prices; G

1.3 SCHEDULE OF PRICES

1.3.1 Data Required

Within 15 calendar days of notice of award, prepare and deliver to the Contracting Officer a Schedule of Prices (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. Provide labor, material, equipment for each line item. Contractor overhead and profit including salaries for field office personnel, if applicable, must be proportionately spread over all pay items and not included as individual pay items. Summarize costs and for each construction category.

1.3.2 Payment Schedule Instructions

Payments will not be made until the Schedule of Prices has been submitted to and accepted by the Contracting Officer.

Additionally, the Schedule of Prices must be separated as follows:

a. Primary Facilities Cost Breakdown:

Defined as work on the primary facilities out to the 5 foot line. Work out to the 5 foot line includes construction encompassed within a theoretical line 5 foot from the face of exterior walls and includes attendant construction, such as pad mounted HVAC cooling equipment, cooling towers, and transformers placed beyond the 5 foot line.

b. Supporting Facilities Cost Breakdown:

Defined as site work, including incidental work, outside the 5 foot line.

If as-built drawings, eOMSI, or operations and maintenance manuals are required, payments for either will not be made until complete and final submissions are approved by the Contracting Officer. The following minimum amounts must be included as Schedule of Prices line items:

Minimum Schedule of Prices values for complete final approved as-built drawings (based on awarded Contract amount: $0-$150K 4%; $150k-$700k 3%; $700k - $2.49M 2%; $2.5M + 2% (max $200k))

Minimum Schedule of Prices value for complete final approved Operation and Maintenance Manuals (based on awarded Contract amount: $0-$150K 2%; $150k-$700k 2%; $700k - $2.49M 1%; $2.5M + 1% (max $200k))

Minimum Schedule of Prices value for complete final approved eOMSI Workbook (based on awarded Contract amount: $0-$150K 2%; $150k-$700k 2%; $700k - $2.49M 1%; $2.5M + 1% (max $200k))

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. 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. 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 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.

1.4 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 accounting records, equipment use rates must 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. Invoices not completed in accordance with Contract requirements will be returned to the Contractor for correction of the deficiencies. The requests for payment must include the documents listed below.

a. The Contractor's invoice, on NAVFAC Form 4330 furnished by the Government, showing in summary form, the basis for arriving at the amount of the invoice. Form 4330 must include certification by the Quality Control (QC) Manager as required by the Contract.

b. The Estimate for Voucher/ Contract Performance Statement on NAVFAC Form 4330 furnished by the Government. Use NAVFAC Form 4330, unless otherwise directed by the Contracting Officer, on NAVFAC Contracts when a Monthly Estimate for Voucher is required.

c. Contractor's Monthly Estimate for Voucher and Contractors Certification (NAVFAC Form 4330) with Subcontractor and supplier payment certification. Other documents, including but not limited to, that need to be received prior to processing payment include the following submittals as required. These items are still required monthly even when a pay voucher is not submitted.

d. Monthly Work-hour report.

e. Updated Construction Progress Schedule and tabular reports required by the Contract.

f. Contractor Safety Self Evaluation Checklist.

g. Updated submittal register.

h. Solid Waste Disposal Report.

i. Certified payrolls.

j. Updated testing logs.

k. Other supporting documents as requested.

1.5.2 Submission of Invoices

If DFARS Clause 252.232-7006 Wide Area Work Flow Payment Instructions is included in the Contract, provide the documents listed in above paragraph CONTENT OF INVOICE 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, provide it as instructed by the Contracting Officer.

Monthly invoices and supporting forms for work performed through the anniversary award date of the Contract must be submitted to the Contracting Officer within 5 calendar days of the date of invoice. For example, if Contract award date is the 7th of the month, the date of each

monthly invoice must be the 7th and the invoice must be submitted by the 12th of the month.

1.5.3 Final Invoice

a. A final invoice must be accompanied by the Final Release. If incorporated, the Final Release must contain the corporate seal. An officer of the corporation must sign and the corporate secretary must certify the Final Release.

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

c. Final invoices not accompanied by the Final Release will be considered incomplete and will be returned.

1.6 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests 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 32.103 Progress Payments Under Construction Contracts:

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 FAR 52.236.21.

1.6.2 Payment for Onsite and Offsite Materials

Progress payments may be made 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 must 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/pre-stressed 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 must be specifically and separately identified in the estimates of work submitted for the Contracting Officer's approval in accordance with Schedule of Prices requirement of this Contract. Requests for progress payment consideration for such items must be supported by documents establishing their value and that the title requirements of the clause at FAR 52.232-5 "Payments Under Fixed-Price Construction Contracts" 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 must be stored in the Continental United States. Other locations are subject to written approval by the Contracting Officer.

g. Materials in transit to the job site or storage site are not acceptable for payment.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

Background

Throughout the installation there exists over 2,200 miles of copper "Ground Grid". It is all but certain that any ground disturbing work will result in the encountering of the Ground Grid. Interactions with this grid must follow the requirements as provided in this document. The possibility exists for the Ground Grid to be electrically charged and should be treated with extreme caution.

Ground Grid interaction outside of the Antenna Arrays are different than inside of the Arrays or in the Bowtie area (the area between the Arrays). Rebar, fencing, and structures outside of the antenna arrays will NOT be attached to the Ground Grid. Grounding outside of the Arrays will be engineer and constructed with the potentials from the RF power levels of the Arrays taken into consideration.

General Requirements (all Ground Grid interactions)

1. No excavation is to occur without approval gained from NCTAMS det Cutler via the Contracting Officer Representative (COR)
2. The Ground Grid is considered an UNDERGROUND UTILITY. Requirements related to identifying, marking, interaction, etc as specified in the Contract Documents is to be adhered to. This includes, but is not limited to appropriate Utility Locating to locate the Ground Grid.
3. A minimum of ten days prior to planned activities that involve the Ground Grid, submit to the COR a detailed work plan which also indicates on a drawing what Ground Grid has been located in the area of work and all planned activities involving interaction with the Ground Grid. **No grid may be cut without Mission approval received via the COR.**
4. Note that the Ground Grid varies in size and any repairs made should be the same gauge as the specific wire being repaired.
5. Any rebar is to be provided with a suitable copper pigtail and be exothermically welded to a suitable grounding system based on location.
6. Any work not specifically described in this document shall be reviewed with the COR to determine required approvals.
7. Where splicing occurs, splice material to match gauge of existing.

Procedures for Excavating in Areas of Ground Grid

Contractor shall provide detailed work plan that incorporates the following requirements to maintain worker safety while performing work around the Ground Grid.

Locating and exposing grounding grid (May be performed during Mission operation)

1. The Ground Grid is shallow and once located should be exposed using non-conductive hand tools in accordance with contract requirements to hand dig within 3' of any utility. Care should be taken not to break the Ground Grid. If a breaks in the Ground Grid are encountered, it should be flagged and avoided until the Mission is offline.

2. Grid should be exposed in an area larger than that required for the intended work.

3. Grid Shall NOT BE CUT, HANDLED, or EXOTHERMIC WELDED back together when Mission is Operating. *Note that different grounding grid wire sizes may be encountered.*

Cutting Ground Grid (Shall only be performed when Mission is offline)

1. Cut grid on both sides of work area with sufficient clearance to work area.

2. Mark cut end with nylon string or other means to recover cut end and cover with soil (min 8") with string or other means exposed to surface for future locating. Alternatively, contractor may utilize insulated mats with a minimum rating of 600 V.

3. Label cut section to ensure it can be placed back in its original location and attached to original conductor, then relocate it away from the work area to protect it from damage during work. Splicing in additional wire to reconnect to original wire is acceptable.

4. Note the area cleared of ground grid shall be based on contractor estimated production operations between down days and so that both cutting and exothermic welding can be completed on adjacent sections during mission down times. Only approved cutting as submitted to the COR shall be performed. Additional ground grid shall not be removed without Det Cutler approval received via the COR.

New Construction (May be performed during Mission operation once Ground Grid is secured)

1. Perform the Contract Work
    a. Use low ground pressure equipment or ensure grid is removed beyond the limits of construction equipment travel to prevent damage to shallow grid.
    b. Connections to rebar ground leads shall not be made to suitable grounding system while mission is operating.

Restoring Ground Grid (Shall only be performed during Mission downtime)

1. Uncover cut ends
2. Exothermic weld grid pieces back in original location and attached to original conductor. Splicing in additional wires to original wire is acceptable. *Note that different grounding grid wire sizes may be encountered and grounding grid wires must be put back in same location or replaced with copper to match existing wire size for that location.*

*To eliminate the potential for current travelling through the rebar, the KTR may wait until such time as rebar is discontinuous with an adjacent section of construction (ie where a ductbank intersects a rebar discontinuous manhole) or after foundations are backfilled before connecting leads to suitable grounding system.

Grounding of Metal Installations including Fences, Poles, and Similar

Mission approvals as explained in "Procedures for Excavating in Areas of Grounding Grid" still apply.

1. Any metal permanently installed on site, such as a fence is to be grounded to a suitable grounding system.

2. Fencing outside the Arrays will NOT be connected to the existing Ground Grid. Every pole is to be grounded with a 4 or 6 gauge wire and a ground rod. The fencing will require grounding that is engineered with the potentials from the RF power levels of the Arrays taken into consideration.

3. Fencing inside the Arrays and Bowtie areas are to be grounded by an exothermic welded 4 or 6 gauge wire to the Ground Grid.

4. Security Cables will be grounded on both ends

5. All gates require a ground jumper wire around all hinges. Lock plates either need to be electrically isolated or jumpers installed across the locks.

Permanent Alterations to the Ground Grid

In the event a project necessitates the altering of the ground grid, the following procedures are to be followed. This includes the construction of buildings, retention ponds, and similar ground disturbance activities. Mission approvals as explained in "Procedures for Excavating in Areas of Ground Grid" still apply.

1. Any rebar used on site is to be connected to the suitable grounding system.

2. For new structures with foundations/slabs
    a. Ground Buss around existing buildings is a continuous 1/0 copper wire. New structures shall match this detail.
    b. Engineered and constructed to provide sufficient grounding of rebar exposed to the RF power levels of the Arrays.
    c. Existing Ground Grid located below new footings/foundation/slab locations will be rerouted around new construction to maintain a continuous circuit.

3. For Retention ponds and similar projects
    a. All affected Ground Grid is to be replaced with new Ground Grid a minimum of 12" below finish elevation of water body base and edges.
    b. New Ground Grid to be connected to existing grid at perimeter of disturbance with exothermic weld with same gauge as the specific section being extended

installation.

(2) Persons requesting access who are not in possession of an approved, government issued credential listed in paragraph 1204.b. shall provide an unexpired document for identity proofing purposes listed in Table 12-1. Any fraudulent information passed during the process may lead to prosecution under appropriate legal authorities.

(3) Authorized government representatives shall, prior to acceptance, visually and tactilely (by touch or feel) inspect documents for evidence of tampering, alteration, or other indications of falsified/fraudulent documents. Authorized government representatives will not accept documents that appear to be fraudulent, forged, or counterfeit and follow the CO's directed standards for response actions to include detention of persons attempting to provide fraudulent documents. Indications of tampered documents include:

(a) Strange text, fonts, slightly altered text, incomplete letters, misaligned words, strange spacing and errors in punctuation or spelling.

(b) Texture or physical indication the photograph has been glued over the original.

Table 12-1. List of Identity Proofing Documents

Documents that Establish Identity
1. U.S. Passport or Passport Card
2. Permanent Resident Card or Alien Registration Receipt Card (Form I-551)
3. Foreign passport that contains a temporary I-551 stamp or temporary I-551 printed notation on a machine-readable immigrant visa (MRIV)
4. Employment Authorization Document (Card) that contains a photograph (Form I-766)
5. In the case of a nonimmigrant alien authorized to work for a specific employer incident to status: (a) Foreign passport; and (b) Form I-94 or Form I-94A has the following: (1) Bearing the same name as the passport; and (2) An endorsement of the alien's nonimmigrant status, as long as the period of endorsement has not yet expired and the proposed employment is not in conflict with any restrictions or limitations identified on the form.
6. Driver's license or ID card issued by a RealID Act compliant state or outlaying possession of the U.S., provided it contains

a photograph and biographic information such as name, date of birth, gender, height, eye color, and address. Licenses or IDs possessing "NOT APPLICABLE FOR FEDERAL PURPOSES" will not be accepted.
7. State-issued Enhanced Driver's licenses
8. Driver's license issued by the U.S. Department of State
9. Border Crossing Card (From DSP-150)
10. Identification card issued by Federal, State, or local government agencies, provided it contains a photograph and biographic information such as name, date of birth, gender, height, eye color, and address.
11. Veteran Health Identification Card (VHIC) issued by the Department of Veterans Affairs
12. Department of Homeland Security "Trusted Traveler" Cards (Global Entry, NEXUS, SENTRI, FAST)
13. U.S. Certificate of Naturalization or Certificate of Citizenship (Form N-550)
14. School identification card with a photograph
15. Persons under the age of 18 who are unable to present a document listed above may present one of the below documents. (a) School record or report card (b) Day care or nursery school record (c) Birth certificate (original or certified copy)
16. Native American Tribal Photo ID cards
17. U.S. Coast Guard Merchant Mariner Credential (MMC) or Merchant Mariner's Documents (MMD)
18. Other documents that may be provide for identity proofing purposes, but must be accompanied by a second form of ID with photograph and biographical information.
a. Social Security Number card
b. Original or certified copy of a birth certificate issued by a state, county, municipal authority, or outlying possession of the U.S. bearing an official seal.
c. Certification of birth Abroad issued by the U.S. Department of State (Form FS-545)
d. Certification of Report of Birth issued by the U.S. Department of State (Form DS-1350
e. Voter's Registration Card

d. Outside the Continental United States (OCONUS)

(1) NSF will utilize appropriate identity proofing credentials such as a passport or nationally issued identity card, or other COCOM approved ID.

(2) ISO will codify approved non-U.S. identity proofing

SECTION 01 30 00.00 22

ADMINISTRATIVE REQUIREMENTS (PWD ME)
08/22

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

NAVFAC Red Zone Facility Turnover Planning Meeting Checklist and POAM; G

Progress and Completion Pictures; G

NAVFAC PWD ME Internal Service Requirements List; G

1.3 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, 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 a view location sketch indicating points of view. Submit with the monthly invoice two sets of digital photographs each set on a separate CD-R, cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Photographs for each month must be in a separate monthly directory and each file must be named to indicate its location on the view location sketch. The view location sketch must also be provided on the CD as digital file. All file names must include a date designator. Cross reference submittals in the appropriate daily report. Photographs must be provided for unrestricted use by the Government.

1.4 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 law.

1.5 SUPERVISION

1.5.1 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.

1.5.2 Superintendent Qualifications

Provide project superintendent with 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.

The Project Superintendent must be on site during working hours. The Superintendent **cannot** be the Quality Control Manager nor the Site Safety and Health Officer (SSHO).

1.5.2.1 Duties

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

1.5.3 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.

1.6 PRECONSTRUCTION MEETING

Notify the Construction Manager assigned to this project to arrange and hold a preconstruction meeting with all interested parties prior to start of work. **The Pre-Construction meeting must be held no later than 30 Calendar days from receiving the Signed Contract or Task Order from the Contracting Officer, but prior to commencement of any work at the site.** The purpose of this meeting is to discuss and develop a mutual understanding of the administrative requirements of the Contract including but not limited to: daily reporting, invoicing, value engineering, safety,

Base-access, outage requests, hot work permits, schedule requirements, quality control, Government Quality Assurance procedures and required Contractor coordination, schedule of prices, shop drawings, submittals, cybersecurity, prosecution of the work, Government acceptance, final inspections, and Contract close-out. Contractor must present and discuss their basic approach to scheduling the construction work and any required phasing.

1.6.1 Attendees

Contractor attendees must include the Project Manager, Superintendent, Site Safety and Health Officer (SSHO), Quality Control Manager, and major Subcontractors.

The following Preconstruction submittals must be submitted to the Contracting Officer fifteen (15) calendar days prior to the pre-construction meeting:

Specification	Description
01 32 16.00 20	Construction Schedule
01 32 16.00 20	Construction Schedule (3-Week Look Ahead)
01 32 16.00 20	Construction Schedule (Outages)
01 35 26.00 22	Accident Prevention Plan (APP)
01 45 00.00 22	Construction Quality Control (QC) Plan

The following Pre-construction submittals must be submitted to the Contracting Officer at the pre-construction meeting:

Specification	Description
01 14 00.00 20	List of Contact Personnel
01 20 00.00 22	Schedule of Prices
01 30 00.00 22	NAVFAC Red Zone Facility Turnover Planning Meeting Checklist and POAM
01 30 00.00 22	NAVFAC PWD ME Internal Service Requirements List
01 31 23.13 20	List of Contractor Personnel (eCMS)
01 33 00	Submittal Register
01 50 00.00 22	Construction site plan

The following Pre-construction submittals must be submitted to the Contracting Officer prior to the start of construction:

Specification	Description
01 11 00.00 20	Work Sequencing, Phasing, and Preparation Plan
01 50 00.00 22	Traffic control plan
01 57 19.00 20	Preconstruction Survey
01 57 19.00 20	Solid Waste Management Plan
01 57 19.00 20	Regulatory Notifications
01 57 19.00 20	Environmental Management Plan (EMP)
01 57 19.00 20	Dirt and Dust Control Plan
01 57 19.00 20	Contractor Hazardous Material Inventory Log
01 57 19.00 20	Storm Water Management/Erosion and Sedimentation Control Plan
01 57 19.00 20	Dewatering Plans
01 57 19.00 20	Spill Prevention, Control, and Countermeasures (SPCC) Plan
01 74 19	Construction Waste Management Plan

Confirm, in writing, the construction start date with the Contracting Officer's Representative at least two (2) working days prior to start

date.

Prepare and distribute minutes of all meetings to the attendees within three (3) working days of the Pre-construction meeting.

1.7 FACILITY TURNOVER PLANNING MEETINGS (NAVFAC Red Zone - RZ)

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 Meeting with a discussion of the Red Zone (RZ) process and convene at regularly scheduled RZ Meetings beginning at approximately 75 percent of construction completion. Include the following in the facility Turnover effort:

1.7.1 RZ Checklist

Prepare a project specific NAVFAC Red Zone Facility Turnover Planning Meeting Checklist and POAM prior to 75 percent completion. See Appendix A of this Section for an example of the Facility Turnover Planning Meeting Agenda and Red Zone (RZ) Checklist-POAM. Contracting Officer's Representative (COR) will provide the Contractor a copy of the Red Zone Checklist template in advance of the RZ turnover meeting.

At the initial Red Zone Facility Turnover meeting, NAVFAC, the Client, and Contractor will modify the Red Zone Checklist template by adding or deleting critical activities applicable to the project and assign planned completion dates for each activity. This becomes the Red Zone POAM which will be utilized through to the Contract completion.

Items listed on the checklists are required to remain on the checklists if they are part of the project/Contract or required by construction convention. Items not listed on the checklists, but required in the Contract or by construction convention, must be added to the checklists by the Contractor, Client, and NAVFAC. The Contracting Officer may request additional activities be added to the Red Zone Checklist at any time as necessary. Checklists are applicable to all Contracts no matter what Category of Work. The Point of Contact and due date must initially be determined during the Facility Turnover Planning Meeting by the NAVFAC, Client, and Contractor leads. During execution of the RZ process, for each item on the entire list, the Construction Manager (CM) must indicate date completed and initial to indicate completion of the item. If a party fails to complete an item by the due date, this must be noted on the checklist and a new due date established and indicated.

1.7.2 Meetings

a. Upon Government acceptance of the RZ Checklist-POAM, the COR will send out the acepted RZ Checklist-POAM to all attendees. The Project Superintendent is required to lead regular Red Zone Meetings beginning at approximately 75 percent project completion, or three (3) to six (6) 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. At the beginning, Red Zone meetings may be every two (2) weeks then increase to weekly towards the final month of the project.

c. Using the RZ Checklist-POAM 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. Discuss and coordinate with the COTR for upcoming activities that require Government involvement.

e. All parties must maintain their copy of the RZ Checklist-POAM documenting the actual completion dates as work is completed and update the RZ Checklist-POAM with revised planned completion dates as necessary to match progress. The CM will maintain the master RZ Checklist-POAM, periodically distributing a scanned copy of the current RZ Checklist-POAM to attendees via email after significant progress is made.

1.7.3 NAVFAC PWD ME Internal Service Requirements List

An initial, pre-edited draft of the NAVFAC PWD ME Internal Service Requirements List is included in Appendix B of this Section.

Include all information usually listed on manufacturer's name plate. The Internal Service Requirements List must include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), manufacturer, model number, serial number, capacity, floor coverings, wall and ceiling surfaces; types and square footage of coverage, lighting fixtures, bathroom fixtures, windows, and HVAC filters.

Submit a preliminary Internal Service List to the COR at the initial Facility Turnover Meeting. Provide the final completed Internal Service List with all required facility system/equipment information to the COR at least ninety (90) calendar days prior to the project BOD.

1.8 PARTNERING

To most effectively accomplish this Contract, the Contractor and Government must form a cohesive partnership with the common goal of drawing on the strength of each organization in an effort to achieve a successful project without safety mishaps, conforming to the Contract, within budget, and on schedule. The partnering team must consist of personnel from both the Government and Contractor including project level and corporate level leadership positions. Key Personnel from the supported command, end user (who will occupy the facility), NAVFAC, PWD Maine Design and Construction team and Subject Matter Experts (SME's), FEAD, Design Manager (DM), Construction Manager (CM), Engineering Technician (ET), Contractor, key Subcontractors, and the Designer of Record are required to participate in the Partnering process.

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

1.8.1 Team-Led (Informal) Partnering

a. The Contracting Officer will coordinate the initial Team-Led (Informal) Partnering Session with key personnel of the project team, including Contractor and Government personnel. The Partnering Session will be co-led by the Government Construction Manager and Contractor's Project Manager.

b. The Initial Team-led Partnering session may be held concurrently with the Pre-Construction meeting. Partnering sessions will be held at a location mutually agreed to by the Contracting Officer and the Contractor, typically at a conference room on-Base or at the Contractor's temporary trailer.

c. The Partners will determine the frequency of the follow-on sessions.

d. Participants will bear their own costs for meals, lodging, and transportation associated with Partnering.

1.9 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 --

01 30 00 APPENDIX A

NAVFAC Red Zone
Facility Turnover Planning Meeting

AGENDA

I. Introduction and Overview – Purpose CM

The purpose of the Facility Turnover Planning Meeting is to address elements within the project team's purview – schedule management, assure completed facility complies with contract requirements, and other contractual issues. Each member of the project delivery team (Client, NAVFAC, and the contractor) has critical responsibilities to ensure timely completion and turnover of the new facility and each member should execute the NRZ process to achieve this end. The NRZ process provides a final re-focusing of attention to details of those key elements critical for a successful construction contract completion. In implementing NRZ processes, the NAVFAC/Contractor/Client team take a collective "snapshot" of contract status, identifying remaining actions to be accomplished, and confirm required resources needed for successful contract completion and turnover to the Client.

The Facility Turnover Planning Meeting is a collaborative effort between the Client, NAVFAC, and the contractor and results in a completed "NRZ Checklist/POAM Items" list that identifies the major items (and their due dates) that must be completed by the Contractor, the Client and the NAVFAC team to ensure timely completion of the contract.

II. Attendees

NAVFAC Echelon IV (PM); NAVFAC FEAD/ROICC Team (AROICC, CM, ET/QA, Contracting Officer); Client Team (Project Manager, Program Coordinator, User/Tenant); Contractor Team (Project Manager, Project Superintendent, CQC Manager)

III. Schedule to Completion (POAM) Contractor

IV. Schedule of Final Outfitting and Occupancy (POAM) Client

V. Critical feature(s) of project (POAM) CM

VI. Transfer of Maintenance Responsibility CM

VII. Systems training & O&M Manuals (POAM) CQC Manager

VIII. Other Items to include on NRZ checklists All

IX. Summary of Required Actions and Responsibility CM

Guidelines for conducting Facility Turnover Planning Meeting are as follows:

a. Meeting is held at approximately 75% construction contract completion or three to six months prior to BOD. NAVFAC representatives will include the Project Manager, Construction Manager/AROICC (CM) and Design Manager (DM), as appropriate. The contractor representatives include applicable prime contractor staff and decision-makers from major subcontractors. Design-Build contractors will have A-E representatives attending. The Client should include representatives from Public Works Officer (PWO) staff, a Client scope and financial decision maker, a user tenant representative, a facility start-up person, and others such as SPAWAR, NMCI, telephone, and furniture contractor, etc.

b. The purpose of the meeting is to plan the remaining work, identify critical project features that still need to be completed (such as "soft" construction contract requirements as shown on the NRZ Checklist/POAM Items), and to complete the filling out of the "NRZ Checklist/POAM Items".

c. The contractor, client and NAVFAC provide a POC and due date for each item on their checklist. The team fills in the checklists by selecting items applicable to the project, selects due dates on each item, and appoints a person who has responsibility to ensure the item gets completed by the due date. The CM will be responsible to monitor the milestones.

NRZ Checklist/POAM Items

The table below provides typical NRZ checklist items for contractor, Client, and NAVFAC actions. Items listed on the checklists are required to remain on the checklists if they are part of the project/contract or required by construction convention. Items not listed on the checklists, but required in the contract or by construction convention, must be added to the checklists by the contractor, Client and NAVFAC. Checklists are applicable to all contracts no matter what Category of Work.

The Point of Contact and due date shall initially be determined during the Facility Turnover Planning Meeting by the NAVFAC, client and contractor leads. During execution of the NRZ process, for each item on the entire list, the Construction Manager (CM) shall indicate date completed and initial to indicate completion of the item. If a party fails to complete an item by the due date, this should be noted on the checklist and new due date established and indicated. The completed NRZ Checklist/POAM shall be placed in the contract file.

Resp.	Checklist Items	Point of Contact	Due Date	Actual Complete Date	CM Initials	Notes
Client	Telephone service contract					
Client	Utilities service contract					
Client	Custodial service contract					
Client	Coordination of Intrusion Detection Systems and Physical Security Equipment					
Client	Coordination of IT and Communication Infrastructure and Devices					
Client	Delivery and installation of client furnished equipment					
Client	Delivery and installation of client furnished furniture					
Client	GFE status/delivery schedule (GFCI, GFGI)					
Client	Installation of communications for phones and computers					
Client	Modification to FSC or BOSC to maintain/service new facility					
Client	NMCI Installations or other networks					
Client	Process operating permits					i.e. generators
Client	Recycled/recovered materials report					

Client	Ribbon-cutting ceremony					
Client	User move-in					
Contractor	ACATS Controls Testing					
Contractor	Communications / IT Systems Testing					
Contractor	Conduct Second Seasons TAB					
Contractor	Coordination and Delivery of Facility Signage					
Contractor	Delivery of As-Built Drawings					
Contractor	Delivery of Internal Services Requirement List					60 days prior to BOD
Contractor	Delivery of O&M Manuals					
Contractor	Delivery of Spare Parts, Extra Stock, Special Tools, etc.					
Contractor	Duct Air Leakage Testing					
Contractor	Electrical Systems Testing					
Contractor	Elevator Certification(s)					
Contractor	EV Notebook submitted (Spec Sec Temp EV Controls - SWPP etc.)					

Contractor	Final Cleaning					
Contractor	Demob					
Contractor	Final Inspection and Acceptance					
Contractor	Final utility systems connections (power, water, etc.)					
Contractor	Fire Protection Systems Inspections and Performance Verification					
Contractor	HVAC System Test & Balance					
Contractor	Landscaping Complete					
Contractor	Notice of Termination (EV Permits)					
Contractor	O&M/OMSI Training of Navy Personnel					
Contractor	Other Specified Building Performance Requirements					i.e. leed
Contractor	Plumbing / Other Mechanical Testing					
Contractor	Pre-Final Inspection					
Contractor	Pre-warranty Conference					
Contractor	Project Close-out Meeting					

Contractor	Provide Interim DD1354					
Contractor	Punch List Completion					
Contractor	Replace Construction Lock Cores and Re-keying					
Contractor	Security Systems Testing					
Contractor	Site Restoration, if applicable					
Contractor	Specialized Equipment & Systems Inspections (Boilers, UPS, etc.)					
Contractor	Superchlorination of potable water systems					
NAVFAC	A-E and Construction Contractor Evaluations (ACASS/CCASS)					
NAVFAC	Client walk-thru prior to pre-final inspections, if appropriate					
NAVFAC	Closeout actions on construction permits (e.g., NPDES)					
NAVFAC	Complete Installed Property List and DD 1354					
NAVFAC	Confirm utilities availability for final connections by contractor					
NAVFAC	Mechanical Acceptance					
NAVFAC	Process final payment (w/ final release)					

NAVFAC	Process recycled/recovered materials report					
NAVFAC	Provide keying plan to contractor					
NAVFAC	Resolve contract modifications & requests for equitable adjustment					
NAVFAC	Return unobligated funds					
NAVFAC	Schedule client satisfaction post BOD follow-up					
NAVFAC	Schedule Government inspections of specialized equipment (e.g., Boiler/pressure vessels, elevators, UPS,					
NAVFAC	Sign & provide Interim DD1354 to activity Real Property Accountability Officer NLT BOD					
NAVFAC	Startup utilities					

SECTION 01 30 10.00 22

COORDINATION PROCEDURES AND COORDINATION DRAWINGS (PWD ME)
01/22

PART 1 GENERAL

1.1 SUMMARY

Requirements of this Section apply to, and are a component part of, each Section of the specifications.

1.2 GENERAL COORDINATION PROCEDURES

1.2.1 Coordination

Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation. Each subcontractor must participate in coordination requirements. Certain areas of responsibility are assigned to a specific subcontractor.

a. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.

b. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

c. Make adequate provisions to accommodate items scheduled for later installation.

1.2.2 Distribution of Memoranda

Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

a. Prepare similar memoranda for the Government and separate subcontractors if coordination of their Work is required.

1.2.3 Project Coordination Meetings

Conduct weekly Project Coordination Meetings either separately or in conjunction with weekly Quality Control Meetings to discuss project planning, coordination, and performance of on-going and future construction activities.

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-02 Shop Drawings

Coordination Drawings; G

1.4 COORDINATION DRAWINGS

1.4.1 General

At a minimum provide thorough and complete coordination drawings indicating as a minimum existing conditions including existing structure, walls, openings, floor to floor heights, ceiling heights, clear opening dimensions, existing utilities to remain, proposed openings to be provided by contractor through existing floors, walls, partitions, roof deck, along with proposed location, layout, and arrangement of plumbing, electrical, and communication systems including, but not limited to, piping, cable tray, conduit feeders, floor poke throughs, equipment, panelboards, control panels, equipment service areas, and other items that must be shown to ensure a coordinated installation. Drawings must indicate adequate clearance for operation, maintenance, and replacement of operating equipment and devices. Coordinate with each applicable Section in this Project Specification.

Prepare coordination drawings according to requirements above and in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity. The intent of the coordination drawings is to identify conflicts, and resolve them prior to on-site construction activities to the benefit of the Contractor and the Government.

Note: Electronic files of the Contract Drawings will be made available for use in the preparation of coordination drawings.

a. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

    1. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    2. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    3. Indicate functional and spatial relationships of components of architectural, structural, civil, plumbing, communication systems, and electrical systems.
    4. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the facility.
    5. Indicate required installation sequences.
    6. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

1.4.2 Coordination Drawing Organization

Organize coordination drawings as follows:

a. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire suppression, communication systems, fire alarm and mass notification system, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.

b. Mechanical and Electrical Rooms: Provide coordination drawings for mechanical and electrical rooms showing plans and elevations of plumbing, communication systems, and electrical equipment.

c. Structural Penetrations: Indicate penetrations and openings required for all disciplines in existing floors and walls.

d. Plumbing Work: Show the following:

    1. Sizes and bottom elevations of piping and conduit runs, including insulation, bracing, flanges, and support systems.
    2. Dimensions of major components, such as valves, cleanouts, control panels, and electrical distribution equipment.
    3. Plumbing piping locations and sizes and locations of plumbing fixtures and equipment.
    4. Drawings must include existing to remain portions of plumbing systems including piping and equipment.

e. Electrical Work: Show the following:

    1. Runs of vertical and horizontal conduit.
    2. Light fixture, exit light, smoke detector, and other fire alarm locations, including dimensions.
    3. Panelboards, transformers, control panels, relays, motor controls, and disconnect switches, including dimensions.
    4. Location and dimensions of pull boxes and junction boxes, dimensioned from column center lines.
    5. Locations and dimensions of cable trays.
    6. Drawings must include existing to remain portions of conduits and electrical systems and components.

f. Communication Systems: Show the following:

    1. Locations of panels and components.
    2. Locations and dimensions of cable trays.
    3. Drawings must include existing to remain portions of conduits and cable trays.

g. Review: Coordination drawings will be reviewed by the Government to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If the Government determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Government will so inform Contractor, who must make suitable modifications and resubmit.

1.4.3 Coordination Digital Data Files

Prepare coordination digital data files according to the following requirements:

a. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.

b. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format and PDF format.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 31 23.13 20

ELECTRONIC CONSTRUCTION AND FACILITY SUPPORT CONTRACT MANAGEMENT SYSTEM
05/17, CHG 6: 02/21

PART 1 GENERAL

1.1 CONTRACT ADMINISTRATION

Utilize the Naval Facilities Engineering Command's (NAVFAC's) Electronic Construction and Facility Support Contract Management System (eCMS) for the transfer, sharing, and management of electronic technical submittals and documents. The web-based eCMS is the designated means of transferring technical documents between the Contractor and the Government. Paper media or e-mail submission, including originals or copies, of the documents identified in Table 1 are not permitted, except where eCMS is unavailable, non-functional, or specifically requested in addition to electronic submission. When specifically requested to provide documents outside of eCMS, upload all final project documentation (e.g. documents that are signed and/or adjudicated by the Government) mentioned in Table 1 into the subject eCMS document management folders that are associated with that document type. Include the identification number of the document, type of document; the name/subject or title; and for daily reports the date (day of work) with format YYYY/MM/DD in the filename. For example: For RFI’s 0011_RFI_Roof_Leaking.doc; For submittals 32a_Submittals_Light_Fixture.pdf; For Daily Reports 0132_Daily_Report_20190504.xls. Contact the Contracting Officer's Representative (COR) regarding availability of eCMS training and reference materials.

1.2 USER PRIVILEGES

The Contractor will be provided access to eCMS. All technical submittals and documents must be transmitted to the Government via the COR. Project roles and system roles will be established to control each user's menu, application, and software privileges, including the ability to create, edit, or delete objects.

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

List of Contractor's Personnel; G

1.4 SYSTEM REQUIREMENTS AND CONNECTIVITY

1.4.1 General

The eCMS requires a web-browser (platform-neutral) and Internet connection. Obtain from an approved vendor an External Certification Authority (ECA), Primary Key Infrastructure (PKI) certificate, or other similar digital identification to support two-factor authentication and access to eCMS. Provide and maintain computer hardware and software for

the eCMS access throughout the duration of the Contract for all Contractor-designated users. Provide connectivity, speed, bandwidth, and access to the Internet to ensure adequate functionality. Neither upgrading of Contractor's computer system nor delays associated from the usage of the eCMS will be justification or grounds for a time extension or cost adjustment to the Contract.

1.4.2 Contractor Personnel List

Within 20 calendar days of Contract award, provide to the Contracting Officer a list of Contractor's personnel who will have the responsibility for the transfer, sharing, and management of electronic technical submittals, and documents and will require access to the eCMS. Project personnel roles to be filled in the eCMS include the Contractor's Project Manager, Designer of Record, Superintendent, Quality Control (QC) Manager, and Site Safety and Health Officer (SSHO). Personnel must be capable of electronic document management. Notify the COR immediately of any personnel changes to the project. The Contracting Officer reserves the right to perform a security check on all potential users. Provide the following information:

First Name
Last Name
E-mail Address (cannot be a personal email address server; e.g. gmail, yahoo)
Office Address
Project Role (e.g. Project Manager, QC Manager, Superintendent)

1.5 SECURITY CLASSIFICATION

In accordance with Department of Navy guidance, all military construction Contract data is unclassified, unless specified otherwise by a properly designated Original Classification Authority (OCA) and in accordance with an established Security Classification Guide (SCG). Refer to the project's OCA when questions arise about the proper classification of information.

The eCMS must only be used for the transaction of unclassified information associated with construction projects. In conformance with the Freedom of Information Act (FOIA), DoD INSTRUCTION 5200.48 CONTROLLED UNCLASSIFIED INFORMATION (CUI), and DoD requirements, any unclassified project documentation uploaded into the eCMS must be designated either "U - UNCLASSIFIED" (U) or "CUI - CONTROLLED UNCLASSIFIED INFORMATION" (CUI). Project photos must not be uploaded to eCMS. All photos must be reviewed by Portsmouth Naval Shipyard Security prior to any public release.

1.6 ECMS UTILIZATION

Establish, maintain, and update data and documentation in the eCMS throughout the duration of the Contract.

Personally Identifiable Information (PII) transmittal is not permitted in the eCMS.

1.6.1 Information Security Classification/Identification

The eCMS must be used for the transmittal of the following documents. This requirement supersedes conflicting requirements in other Sections, however, submittal review times in Section 01 33 00 SUBMITTAL PROCEDURES

remain applicable. Table 1 - Project Documentation Types provides the appropriate U and CUI designations for various types of project documents. Construction documents requiring CUI status must be marked accordingly. Apply the appropriate markings before any document is uploaded into eCMS. Markings are not required on U documents.

Table 1 also identifies which eCMS application is to be used in the transmittal of data (these are subject to change based on the latest software configuration). If a designated application is not functional within 4 hours of initial attempt, defer to the Submittal application and submit the required data as an uploaded portable document (e.g. PDF), word processor, spreadsheet, drawing, or other appropriate format. Hard copy or e-mail submission of these items is acceptable only if eCMS is documented to be not available or not functional or specifically requested in addition to electronic submission. After uploading documents to the Submittal application, transmit the submittals and attachments to the COR via the Transmittal application. For Submittals, select the following:

Preparation by = Contractor personnel assigned to prepare the submittal
Approval by = Contracting Officer's Representative (COR)
Returned by = Design Lead/Manager
Forwarded to = Contractor Project Manager

Table 1 - Project Documentation Types

SUBJECT/NAME	CLASS	REMARKS	ECMS APPLICATION
As-Built Drawings	U	Locations of sensitive areas must be labeled as either "Controlled Area" or "Restricted Area" and may be shown on unclassified documents with the approval from Site Security Manager	Submittals and Transmittals
Base Access Request/Approval	U	1. Verify applicability with local installation security procedures via the Administrative Contracting Office 2. Redact Social Security Numbers (SSNs) prior to upload into eCMS, unless SSNs are required by the local security office to support security clearance investigations or verifications	Communications management, communications

SUBJECT/NAME	CLASS	REMARKS	ECMS APPLICATION
Building Information Modeling (BIM)	U	1. Locations of sensitive areas must be labeled as either "Controlled Area" or "Restricted Area" and may be shown on unclassified documents with the approval from Site Security Manager 2. Design reviews will be performed in existing "Dr Checks"	Submittals and Transmittals
Construction Permits	U	Refer to rules of the issuing activity, state or jurisdiction	Submittals and Transmittals
Construction Schedules (Activities and Milestones)	U	After the schedule submittal is approved by the COR, import the schedule file into the scheduling application, and select "Approve" to establish a new schedule baseline	Submittals, Transmittals, and Scheduling App
Construction Schedules (Cost-Loaded)	U	After the schedule submittal is approved by the COR, import the schedule file into the scheduling application, and select "Approve" to establish a new schedule baseline	Submittals, Transmittals, and Scheduling App
Construction Schedules (3-Week Lookahead)	U	Import the schedule file into the scheduling application, and select "Approve" to establish a new schedule baseline	Scheduling App
DD 1354 Transfer of Real Property	U		Submittals and Transmittals
Daily Production Reports	U	Provide weather conditions, crew size, man-hours, equipment, and materials information	Daily Report
Daily Quality Control (QC) Reports	U	Provide QC Phase, Definable Features of Work Identify visitors	Daily Report

SUBJECT/NAME	CLASS	REMARKS	ECMS APPLICATION
Designs and Specifications	U	1. Locations of sensitive areas must be labeled as either "Controlled Area" or "Restricted Area" and may be shown on unclassified documents with the approval from Site Security Manager 2. Design reviews will be performed in existing "Dr Checks"	Submittals and Transmittals
Environmental Notice of Violation (NOV), Corrective Action Plan	U	Refer to rules of the issuing activity, state or jurisdiction	Submittals and Transmittals
Environmental Protection Plan (EPP)	U		Submittals and Transmittals
Invoice (Supporting Documentation)	U	Applies to supporting documentation only. Invoices are submitted in Wide-Area Workflow (WAWF)	Submittals and Transmittals
Jobsite Documentation, Bulletin Board, Labor Laws, SDS	U		Submittals and Transmittals
Meeting Minutes	U		Meeting Minutes
Modification Documents	U	Provide final modification documents for the project. Upload into "Modifications - RFPs	Document Management
Operations & Maintenance Support Information (OMSI/eOMSI), Facility Data Worksheet	U	1. Locations of sensitive areas must be labeled as either "Controlled Area" or "Restricted Area" and may be shown on unclassified documents with the approval from Site Security Manager 2. Design reviews will be performed in existing "Dr Checks"	Submittals and Transmittals

SUBJECT/NAME	CLASS	REMARKS	ECMS APPLICATION
Photographs		MUST NOT BE SAVED TO ECMS. ALL PHOTOGRAPHS MUST BE REVIEWED BY ACTIVITY SECURITY.	Submittals and Transmittals
QCM Initial Phase Checklists	U		Checklists (Site Management)
QCM Preparatory Phase Checklists	U		Checklists (Site Management)
Quality Control Plans	U		Submittals and Transmittals
QC Certifications	U		Submittals and Transmittals
QC Punch List	U		Punch lists (Testing Logs)
Red-Zone Checklist	U		Checklists (Site Management)
Rework Items List	U		Punch lists (Testing Logs)
Request for Information (RFI) Post-Award	U		RFIs
Safety Plan	U		Daily Report
Safety - Activity Hazard Analyses (AHA)	U		Daily Report
Safety - Mishap Reports	U		Daily Report

SUBJECT/NAME	CLASS	REMARKS	ECMS APPLICATION
SCIF/SAPF Accreditation Support Documents	CUI	Note: Some Construction Security plans may be classified. Classified information must not be uploaded into eCMS. Refer to the Site Security Manager, as applicable.	Submittals and Transmittals
Shop Drawings	U	Locations of sensitive areas must be labeled as either "Controlled Area" or "Restricted Area" and may be shown on unclassified documents with the approval from Site Security Manager	Submittals and Transmittals
Storm Water Pollution Prevention (Notice of Intent - Notice of Termination)	U	Refer to rules of the issuing activity, state or jurisdiction	Submittals and Transmittals
Submittals and Submittal Log	U		Submittals and Transmittals
Testing Plans, Logs, and Reports	U		Submittals and Transmittals
Training/Reference Materials	U		Submittals and Transmittals
Training Records (Personnel)	U		Submittals and Transmittals
Utility Outage/Tie-In Request/Approval	U		Submittals and Transmittals

SUBJECT/NAME	CLASS	REMARKS	ECMS APPLICATION
Warranties/BOD Letter	U		Submittals and Transmittals
Quality Assurance Reports	U		Checklists (Government Initiated)
Non-Compliance Notices	U		Non-Compliance Notices (Government initiated)
Other Government-prepared documents	U		GOV ONLY
All Other Documents	U	Refer to FOIA guidelines and contact the FOIA official to determine whether exemptions exist	As applicable

1.6.2 Markings on CUI documents

a. Only CUI documents being electronically uploaded into the eCMS (.docx, .xlsx, .pptx, .pdf, .jpg, .zip, and others as appropriate), and associated paper documents described in the paragraph CONTRACT ADMINISTRATION require CUI markings as indicated in the subparagraphs below.

b. CUI documents that are originally created within the eCMS application using the web-based forms (RFIs, Daily Reports, and others as appropriate) will be automatically watermarked by the eCMS software, and these do not require additional markings.

c. CUI documents must be marked "UNCLASSIFIED//FOR OFFICIAL USE ONLY" at the bottom of the outside of the front cover (if there is one), the title page, the first page, and the outside of the back cover (if there is one).

d. CUI documents must be marked on the internal pages of the document as "CONTROLLED UNCLASSIFIED INFORMATION" at top and bottom.

e. Where Installations require digital photographs to be designated CUI, place the markings on the face of the photograph.

f. For visual documentation, other than photographs and audio documentation, mark with either visual or audio statements as appropriate at both the beginning and end of the file.

1.7 QUALITY ASSURANCE

Requested Government response dates on Transmittals and Submittals must be in accordance with the terms and conditions of the Contract. Requesting response dates earlier than the required review and response time, without concurrence by the Government COR, may be cause for rejection.

Incomplete submittals will be rejected without further review and must be resubmitted. Required Government response dates for resubmittals must reflect the date of resubmittal, not the original submittal date.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 32 16.00 20

SMALL PROJECT CONSTRUCTION PROGRESS SCHEDULES
08/18, CHG 1: 08/20

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Schedule; G

Three-Week Look Ahead Schedule; G

Outages Schedule; G

SD-07 Certificates

Monthly Updates; G

1.2 ACCEPTANCE

Prior to the start of work, prepare and submit to the Contracting Officer for acceptance a construction schedule in the form of a Bar Chart Schedule in accordance with the terms in Contract Clause "FAR 52.236-15, Schedules for Construction Contracts," except as modified in this Contract.

The acceptance of a Baseline Construction Schedule is a condition precedent to:

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

b. Processing Contractor's invoice(s) for construction activities/items of work.

c. Review of any schedule updates.

Submittal of the Baseline 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).

1.3 SCHEDULE FORMAT

1.3.1 Bar Chart Schedule

The Bar Chart must, as a minimum, show work activities, submittals, Government review periods, material/equipment delivery, utility outages, on-site construction, inspection, testing, Government Activities, and

closeout activities. The Bar Chart must be time scaled and generated using an electronic spreadsheet program. The Government will provide a list of quality assurance (QA) inspections and testing requirements at the pre-construction conference. Incorporate the Government QA inspections and testing requirements into the Bar Chart Schedule. Incorporate access restrictions and special scheduling requirements into the Schedule. Refer to Section 01 14 00.00 20 WORK RESTRICTIONS (PWD ME) (AOR).

1.3.2 Outages Schedule

Submit a proposed outages schedule to the Contracting Officer for discussion and coordination with the Government prior to the Pre-construction Meeting.

1.3.3 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 Construction Schedule.

1.3.4 Schedule Submittals and Procedures

Submit Bar Chart Schedules and updates in hard copy and on electronic media that is acceptable to the Contracting Officer. Submit an electronic back-up of the project schedule in an import format compatible with the Government's scheduling program.

1.4 SCHEDULE MONTHLY UPDATES

Update the Construction Schedule at monthly intervals or when the schedule has been revised. The updated schedule must be kept current, reflecting actual activity progress and plan for completing the remaining work. Submit copies of purchase orders and confirmation of delivery dates as directed by the Contracting Officer.

a. Narrative Report: Provide with schedule updates. 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, and critical path;

(5) Pending items and status thereof, including permits, change orders, and time extensions;

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

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

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

For each entry in the narrative report, cite the respective Activity ID and Activity Name, the date and reason for the change, and description of

the change.

1.5 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 (3) 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. Apportionment must provide identification of delay type and classification of delay by compensable and non-compensable events. The associated narrative must clearly describe analysis methodology used, and the findings in a chronological listing beginning with the earliest delay event.

(1) Identify types of delays as follows:

(a) Force majeure delay (e.g. weather delay): Any delay event caused by something or someone other than the Government (including its agents) or the Contractor, or the risk of which has not been assigned solely to the Government or the Contractor. If the force majeure delay is on the critical path, in absence of other types of concurrent delays, the Contractor is granted an extension of Contract time, classified as a non-compensable event.

(b) A Contractor-delay: Any delay event caused by the Contractor, or the risk of which has been assigned solely to the Contractor. If the Contractor-delay is on the critical path, in absence of other types of concurrent delays, Contractor is not granted extension of Contract time, and classified as a non-compensable event. Where absent other types of delays, and having impact to project completion, provide a Corrective Action Plan, identifying plan to mitigate delay, to the Contracting Officer.

(c) A Government-delay: Any delay event caused by the Government, or the risk of which has been assigned solely to the Government. If the Government-delay is on the longest path, in absence of other types of concurrent delays, the Contractor is granted an extension of contract time, and classified as a compensable event.

(2) Use functional theory to analyze concurrent delays, where: Separate delay issues delay project completion, do not necessarily occur at same time, rather occur within same monthly schedule update period at minimum, or within same as-built period under review. If a combination of functionally concurrent delay types occurs, it is considered Concurrent Delay, which is defined in the following combinations:

(a) Government-delay concurrent with Contractor-delay: Excusable time extension, classified non-compensable event.

(b) Government-delay concurrent with force majeure delay: Excusable time extension, classified non-compensable event.

(c) Contractor-delay concurrent with force majeure delay: Excusable time extension, classified non-compensable event.

(3) A pacing delay, reacting to another delay (parent delay) equally or more critical than paced activity, must be identified prior to pacing. Contracting Officer will notify Contractor prior to pacing. Contractor must notify Contracting Officer prior to pacing. Notification must include identification of parent delay issue, estimated parent delay time period, paced activity(s) identity, and pacing reason(s). Pacing Concurrency is defined as follows:

(a) Government-delay concurrent with Contractor-pacing: Excusable time extension, classified compensable event.

(b) Contractor-delay concurrent with Government-pacing: Inexcusable time extension, classified non-compensable event.

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 schedule.

1.6 3-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 Construction Schedule including any required Government QA inspections. Key the work plans to activity numbers when a schedule is required and update each week to show the planned work for the current and following two-week period. Additionally, include upcoming outages, closures, 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, maintained separately from the Construction Schedule 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 (3) 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.

1.7 CORRESPONDENCE AND TEST REPORTS:

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 Activities that are being addressed. Test reports (e.g., concrete, soil compaction, weld, pressure) must reference Schedule Activities that are being addressed.

1.8 ADDITIONAL SCHEDULING REQUIREMENTS

a. 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.

b. 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), Notice(s) to proceed and delivery of Government Furnished Material/Equipment. The Government will provide a list of QA inspections and testing at the pre-construction meeting.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES
05/22

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 that are required prior to or commencing with the start of work on site. Submittals that are required prior to or at the start of construction (work) or the next major phase of the construction on a multiphase Contract.

Preconstruction Submittals include schedules and a tabular list of locations, features, and other pertinent information regarding products, materials, equipment, or components to be used in the work.

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

Outages Schedule

Network Analysis Schedule (NAS)

Submittal Register

Schedule of Prices or Earned Value Report

Accident Prevention Plan (APP)

Work Plans

Quality Control (QC) Plan

Environmental Management 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 including specified Systems Coordination Drawings.

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 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

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 accordance with specified requirements. Unless specified in another Section, 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 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 document purpose is to further promote the 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 Safety Data Sheets (SDS) concerning impedances, hazards, and safety precautions.

SD-10 Operation and Maintenance Data

Data provided by the manufacturer, or the system provider, including manufacturer's help and product line documentation, necessary to maintain and install equipment, for operating and maintenance use by facility personnel.

Data required 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.

Data incorporated in an operations and maintenance manual or control system.

eOMSI submittals per Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI).

SD-11 Closeout Submittals

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

Submittals required for Guiding Principal Validation (GPV) or Third Party Certification (TPC).

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.

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

Red Zone documents per Section 01 30 00.00 22 ADMINISTRATIVE REQUIREMENTS (PWD ME).

1.1.2 Approving Authority

Office or designated person authorized to approve the 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. In exception, excludes work to produce SD-01 submittals.

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 this Section:

SD-01 Preconstruction Submittals

Submittal register; G

Other submittals required for Government approval prior to beginning any work include, but are not limited to, the following:

Certificates of Insurance
Surety Bonds
List of Proposed Subcontractors
List of Proposed Products
Construction Schedule
Network Analysis Schedule (NAS)
Schedule of Prices or Earned Value Report
Outages Schedule
List of Contact Personal
Qualificationss
Work Plans
Quality Control (QC) Plan
Environmental Management Plan
Solid Waste Management Plan and Permit
Storm Water Pollution Protection Plan
Accident Prevention Plan (APP)
Activity Hazard Analysis (AHA)
Crane Critical List Plan
Crane Operator Qualifications
Construction Site Plan
Traffic Control Plan
Dirt and Dust Control
Construction Hazardous Material Inventory Log

The following Preconstruction submittals must be submitted to the Contracting Officer fifteen (15) calendar days prior to the pre-construction meeting:

Specification Section	SD #	SD Description	Item Submitted	Paragraph #
01 32 16.00 20	01	Preconstruction Submittals	Construction Schedule	1.2
01 32 16.00 20	01	Preconstruction Submittals	Construction Schedule (3 week)	1.3.3
01 32 16.00 20	01	Preconstruction Submittals	Construction Schedule (Outages)	1.3.2
01 35 26.00 22	01	Preconstruction Submittals	Accident Prevention Plan (APP)	1.8.1
01 45 00.00 22	01	Preconstruction Submittals	Construction Quality Control (QC) Plan	1.6.1

The following Preconstruction submittals must be submitted to the Contracting Officer at the pre-construction meeting:

Specification Section	SD #	SD Description	Item Submitted	Paragraph #
01 14 00.00 20	01	Preconstruction Submittals	List of Contact Personnel	1.4.1
01 20 00.00 22	01	Preconstruction Submittals	Schedule of Prices	1.3
01 30 00.00 22	01	Preconstruction Submittals	NAVFAC Red Zone Checklist	1.7.1
01 30 00.00 22	01	Preconstruction Submittals	NAVFAC PWD ME Internal Service Requirements List	1.7.3
01 31 23.13 20	01	Preconstruction Submittals	List of Personnel (eCMS)	1.4.2
01 33 00	01	Preconstruction Submittals	Submittal Register	1.9
01 50 00.00 22	01	Preconstruction Submittals	Construction Site Plan	1.3

The following Preconstruction submittals must be submitted to the Contracting Officer prior to the start of construction:

Specification Section	SD #	SD Description	Item Submitted	Paragraph #
01 11 00.00 20	01	Preconstruction Submittals	Work Sequencing, Phasing, and Preparation Plan	1.4
01 11 00.00 20	01	Preconstruction Submittals	Coordination Drawings	1.4.1

Specification Section	SD #	SD Description	Item Submitted	Paragraph #
01 50 00.00 22	01	Preconstruction Submittals	Traffic Control Plan	3.3.1
01 57 19.00 20	01	Preconstruction Submittals	Preconstruction Survey	1.5.1
01 57 19.00 20	01	Preconstruction Submittals	Solid Waste Management Plan	3.4
01 57 19.00 20	01	Preconstruction Submittals	Regulatory Notifications	1.5.2
01 57 19.00 20	01	Preconstruction Submittals	Environmental Management Plan (EMP)	3.1
01 57 19.00 20	01	Preconstruction Submittals	Dirt and Dust Control Plan	3.14.1
01 57 19.00 20	01	Preconstruction Submittals	Contractor Hazardous Material Inventory Log	3.6
01 57 19.00 20	01	Preconstruction Submittals	Storm Water Management/Erosion and Sedimentation Control Plan	3.2.1.c
01 57 19.00 20	01	Preconstruction Submittals	Spill Prevention, Control, and Countermeasures (SPCC) Plan	3.1.f.2
01 57 19.00 20	01	Preconstruction Submittals	Dewatering Plans	3.2.1.c
01 74 19	01	Preconstruction Submittals	Construction Waste Management Plan	1.6

1.3 PACKAGING AND SUBMISSION OF SUBMITTALS

Prepare and submit submittals required by each individual Specification Section. Each required submittal as listed in the submittal register must be packaged and submitted individually so that it can be tracked, reviewed, and returned in a concise and orderly fashion.

1.4 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.4.1 Government Approved (G)

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Government.

Government approval is required for any variations from the Solicitation

or the Accepted Proposal and for other items as designated by the Government.

Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings."

1.4.2 For Information Only

Submittals not requiring Government approval will be for information only. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are not considered to be "shop drawings."

1.5 FORWARDING SUBMITTALS REQUIRING GOVERNMENT APPROVAL

1.5.1 Submittals Required from the Contractor

As soon as practicable after award of Contract, and before procurement of fabrication, forward to NAVFAC PWD ME submittals required in the technical Sections of this Specification, including shop drawings, product data, and samples. In addition, forward a copy of the submittals to the Contracting Officer.

NAVFAC will review and approve for the Contracting Officer those submittals reserved for Contracting Officer approval to verify submittals comply with the Contract requirements.

1.5.1.1 O&M Data

NAVFAC will review and approve for the Contracting Officer O&M Data to verify the submittals comply with the Contract requirements; submit data specified for a given item within 30 calendar days after the item is delivered to the Contract site.

a. In the event the Contractor fails to deliver O&M Data within the time limits specified, the Contracting Officer may withhold from progress payments 50 percent of the price of the items to which such O&M Data apply.

1.5.1.2 Submittals Reserved for NAVFAC MIDLANT Approval

a. All fire protection and fire alarm systems submittals are to be reviewed by:

NAVFAC MIDLANT CI45 Fire Protection
Attn: NAVFAC FPE
Bldg Z-140, RM 126
9742 Maryland Avenue
Norfolk, VA 23511

1.6 PREPARATION

1.6.1 Transmittal Form

Transmit each submittal, except sample installations and sample panels to the office of approving authority using the transmittal form prescribed by the Contracting Officer. Include all information prescribed by the transmittal form and required in paragraph IDENTIFYING SUBMITTALS. Use the submittal transmittal forms to record actions regarding samples.

Use the transmittal form provided by the Contracting Officer at the Pre-Construction meeting for submitting both Government-approved and information-only submittals. Submit in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the Contract drawings pertinent to the data submitted for each item.

1.6.2 Identifying Submittals

The Contractor's Quality Control Manager must prepare, review, and stamp submittals, including those provided by a Subcontractor, before submittal to the Government.

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 by which submittal is required.

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

g. For 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.

1.6.3 Submittal Format

1.6.3.1 Format of SD-01 Preconstruction Submittals

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

Provide data in the unit of measure used in the Contract Documents.

1.6.3.2 Format for SD-02 Shop Drawings

Provide shop drawings not 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 another form is required. Ensure drawings are suitable for reproduction and of a quality to produce clear, distinct lines and letters, with dark lines on a white background.

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

b. 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.

Present shop drawings sized 8 1/2 by 11 inches as part of the bound volume for submittals. Present larger drawings in sets. Submit an electronic copy of drawings in PDF format.

1.6.3.2.1 Drawing Identification

Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph IDENTIFYING SUBMITTALS.

Number drawings in a logical sequence. Each drawing is to bear the number of the submittal in a uniform location next 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 3 by 4 inches on the right-hand side of each sheet for the Government disposition stamp.

1.6.3.3 Format of SD-03 Product Data

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

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

1.6.3.3.1 Product Information

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

Provide product data in units used in the Contract Documents. Where product data are included in preprinted catalogs with another unit, submit the dimensions in Contract Document units, on a separate sheet.

1.6.3.3.2 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), or 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.

1.6.3.3.3 Data Submission

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal that is 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 the construction effort.

Submit the manufacturer's instructions before installation.

1.6.3.4 Format of SD-04 Samples

1.6.3.4.1 Sample Characteristics

Furnish samples in the following sizes, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately the 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 Volume of Nonsolid Materials: Pint. Examples of nonsolid 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.

1.6.3.4.2 Sample Incorporation

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

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

1.6.3.4.3 Comparison Sample

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.

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

1.6.3.5 Format of SD-05 Design Data

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

1.6.3.6 Format of SD-06 Test Reports

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

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

1.6.3.7 Format of SD-07 Certificates

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

1.6.3.8 Format of SD-08 Manufacturer's Instructions

Present manufacturer's instructions submittals for each Section as a complete, bound volume. 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. If supplemental information is needed to clarify the manufacturer's data, submit it as specified for SD-07 Certificates.

Submit the manufacturer's instructions before installation.

1.6.3.8.1 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), or 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.

1.6.3.9 Format of SD-09 Manufacturer's Field Reports

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

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

1.6.3.10 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. Refer to Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI) for additional requirements.

1.6.3.11 Format of SD-11 Closeout Submittals

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

Provide data in the unit of measure used in the Contract Documents.

1.6.4 Source Drawings for Shop Drawings

The entire set of Source Drawing files (DWG) will not be provided to the Contractor. Request the specific Drawing Number for the preparation of shop drawings. Only those drawings requested to prepare shop drawings will be provided. These drawings are provided only after award.

1.6.4.1 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 is 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 its subconsultants 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 source drawing files are not construction documents. Differences may exist between the source drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic source drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. The Contractor is responsible for determining if any conflict exists. 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. 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 indication of ownership (seals, logos, signatures, initials, and dates).

1.6.5 Electronic File Format

Provide submittals in electronic format, with the exception of material samples required for SD-04 Samples items. In addition to the electronic submittal, provide three (3) hard copies of the submittals. Compile the submittal file as a single, complete document, to include the Transmittal Form described within. Name the electronic submittal file specifically according to its contents, and coordinate the file naming convention with the Contracting Officer. Electronic files must be of sufficient quality that all information is legible. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer. Generate PDF files from original documents with bookmarks so that the text included in the PDF file is both searchable and can be copied. If documents are scanned, Optical Character Resolution (OCR) routines are required. Index and bookmark files exceeding 30 pages to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature or scan of a signature.

Email electronic submittal documents fewer than 10MB to an email address as directed by the Contracting Officer. Provide electronic documents over 10MB on an optical disc, or through an electronic file sharing system such as the DoD SAFE Web Application located at the following website: https://safe.amrdec.army.mil/safe/.

Provide hard copies of submittals when requested by the Contracting Officer. Up to three (3) additional hard copies of any submittal may be requested at the discretion of the Contracting Officer, at no additional cost to the Government.

1.7 QUANTITY OF SUBMITTALS

Make use of electronic media for submittals to the greatest extent possible except for operation and maintenance manuals and associated submittals to be forwarded to the Activity. Refer to Section 01 31 23.13 20 ELECTRONIC CONSTRUCTION AND FACILITY SUPPORT CONTRACT MANAGEMENT SYSTEM for additional requirements.

1.7.1 Number of SD-01 Preconstruction Submittal Copies

Unless otherwise specified, submit three (3) sets of administrative submittals.

1.7.2 Number of Copies of SD-02 Shop Drawings

Submit six (6) copies of submittals of shop drawings requiring review and approval only by QC organization and seven (7) copies of shop drawings requiring review and approval by Contracting Officer.

1.7.3 Number of Copies of SD-03 Product Data

Submit in compliance with quantity requirements specified for shop drawings.

1.7.4 Number of Samples SD-04 Samples

a. Submit two (2) samples, or two (2) sets of samples showing range of variation, of each required item. One (1) approved sample or set of samples will be retained by approving authority and one (1) will be returned to the Contractor.

b. Submit one (1) sample panel or provide one (1) sample installation where directed. Include components listed in technical Sections or as directed.

c. Submit one (1) sample installation, where directed.

d. Submit one (1) sample of non-solid materials.

1.7.5 Number of Copies SD-05 Design Data

Submit in compliance with quantity requirements specified for shop drawings.

1.7.6 Number of Copies SD-06 Test Reports

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

1.7.7 Number of SD-07 Certificate Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.7.8 Number of SD-08 Manufacturer's Instructions Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.7.9 Number of SD-09 Manufacturer's Field Report Copies

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

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

Submit three (3) copies of O&M Data to the Contracting Officer for review and approval.

1.7.11 Number of Copies of SD-11 Closeout Submittals

Unless otherwise specified, submit two (2) sets of administrative submittals.

1.8 INFORMATION ONLY SUBMITTALS

Submittals without a "G" designation must be certified by the QC manager and submitted to the Contracting Officer for information-only. Approval of the Contracting Officer is not required on information only submittals. The Contracting Officer will mark "receipt acknowledged" on submittals for information and will return only the transmittal cover

sheet to the Contractor. Normally, submittals for information only will not be returned. However, the Government reserves the right to return unsatisfactory submittals and require the Contractor to resubmit any item found not to comply with the Contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.9 PROJECT SUBMITTAL REGISTER

1.9.1 Submittal Management

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. The attached Submittal Register may not be all inclusive and additional submittals may be required. **The Contractor must review the plans and specifications and ensure all required submittals are included in the Project Submittal Register which must be submitted to the Contracting Officer with the QC Plan and Project Schedule.**

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.

The Contractor must 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.

1.9.2 Preconstruction Use of Submittal Register

Submit the submittal register. Include the QC plan and project schedule. Verify that all submittals required for the project are listed and add missing submittals. The attached submittal register may not be complete. The Contractor must include all required submittals including any submittals that are required on the plans and specifications. 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 that Contractor needs approval of submittal.

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

1.9.3 Contractor Use of Submittal Register

Update the following fields with each submittal throughout Contract.

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

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

Column (l) Date submittal transmitted.

Column (q) Date approval was received.

1.9.4 Approving Authority Use of Submittal Register

Update the following fields.

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

Column (l) Date submittal was received.

Column (m) through (p) Dates of review actions.

Column (q) Date of return to Contractor.

1.9.5 Action Codes

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

1.9.5.1 Government Review Action Codes

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

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

"C" - "Approved, except as noted on drawings; resubmission required"; "Resubmit"

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

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

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

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

"X" - "Receipt acknowledged, does not comply with Contract requirements"; "Resubmit"

1.9.6 Delivery of Copies

Submit an updated submittal register to the Contracting Officer with each invoice request. Provide an updated Submittal Register monthly regardless of whether an invoice is submitted.

1.10 VARIATIONS

Variations from Contract requirements require both Designer of Record (DOR) and Contracting Officer approval pursuant to Contract Clause FAR 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION and will be considered where advantageous to Government.

1.10.1 Considering Variations

Discussion of variations with the Contracting Officer before submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. For variations that include design changes or some material or product substitutions, the Government may require an evaluation and analysis by a licensed professional engineer hired by the Contractor. 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 a transmittal letter. Failure to point out variations may cause the Government to require rejection and removal of such work at no additional cost to the Government.

1.10.2 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 the 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.

1.10.3 Warranting that Variations are Compatible

When delivering a variation for approval, the 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.

1.10.4 Review Schedule Extension

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

1.11 SCHEDULING

Schedule and submit concurrently product data and shop drawings covering component items forming a system or items that are interrelated. Submit pertinent certifications at the same time. No delay damages or time extensions will be allowed for time lost in late submittals.

a. Coordinate scheduling, sequencing, preparing, and processing of

submittals with performance of work so that work will not be delayed by submittal processing. The Contractor is responsible for additional time required for Government reviews resulting from required resubmittals. The review period for each resubmittal is the same as for the initial submittal.

b. Submittals required by the Contract Documents are listed on the submittal register. If a submittal is listed in the submittal register 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 that have been omitted from the register or marked "N/A".

c. Resubmit the submittal register and annotate it monthly with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

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

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

1.11.1 Reviewing, Certifying, and Approving Authority

The QC Manager is responsible for reviewing all submittals and certifying that they are in compliance with Contract requirements. The approving authority on submittals is the QC Manager unless otherwise specified. At each "Submittal" paragraph in individual specification Sections, a notation "G," following a submittal item indicates that the Contracting Officer is the approving authority for that submittal item. Provide an additional copy of the submittal to the Government approving authority.

1.11.2 Constraints

a. Conform to provisions of this Section, unless explicitly stated otherwise for submittals listed or specified in this Contract.

b. Submit complete submittals for each definable feature of the work. At the same time, submit components of definable features that are interrelated as a system.

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

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

1.11.3 QC Organization Responsibilities

a. Review submittals for conformance with project design concepts and compliance with Contract Documents.

b. Process submittals based on the approving authority indicated in the submittal register.

(1) When the QC manager is the approving authority, take appropriate action on the submittal from the possible actions defined in paragraph APPROVED SUBMITTALS.

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

c. Ensure that material is clearly legible.

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

(1) When the approving authority is the Contracting Officer, the 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 the QC Manager, the QC Manager will use the following approval statement when returning submittals to the 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)

e. Sign the 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.

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

g. Retain a copy of approved submittals and approved samples at the project site.

1.12 GOVERNMENT APPROVING AUTHORITY

When the approving authority is the Contracting Officer, the Government will:

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

b. Review submittals for approval within the 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 REVIEW NOTATIONS herein and with comments and markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date submittals. Two (2) copies of the submittal will be retained by the Contracting Officer and the remaining copies of the submittal will be returned to the Contractor. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be identified and returned, as described above.

1.12.1 Review Notations

Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize proceeding with the work covered.

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

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit" indicate an incomplete submittal or noncompliance with the Contract requirements or design concept. Resubmit with appropriate changes. Do not proceed with work for this item until the resubmittal is approved.

d. Submittals marked "not reviewed" indicate that the submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by the 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.

e. Submittals marked "receipt acknowledged" indicate that submittals have been received by the Government. This applies only to "information-only submittals" as previously defined.

1.13 DISAPPROVED SUBMITTALS

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, give notice to the Contracting Officer as required under the FAR clause titled CHANGES. The Contractor is responsible for verifying dimensions of connection details and design of connection details and construction of work. Failure to point out variations may cause the Government to require the rejection and removal of such work at the Contractor's expense.

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

1.14 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals is not 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 by the Government for a submittal does not relieve the Contractor of the responsibility for meeting the Contract requirements or for any error that may exist, because under the Quality Control (QC) requirements of this Contract, the Contractor is responsible for ensuring information contained with in each submittal accurately conforms with the requirements of the Contract Documents.

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.

1.15 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, provide assurance 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 its expense, upon completion of the Contract. Unapproved samples 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. The Government reserves the right to disapprove any material or equipment that has previously 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. Replace such materials or equipment to meet Contract requirements.

Approval of the samples by the Contracting Officer does not relieve the Contractor of its responsibilities under the Contract.

1.16 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained. No payment for materials incorporated in the work will be made unless all required DOR approvals or required Government approvals have been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information-only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.17 CERTIFICATION OF SUBMITTAL DATA

Certify the submittal data as follows on Form ENG 4025: "I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the Contract drawings and specifications except as otherwise stated."

_____NAME OF CONTRACTOR _____ SIGNATURE OF CONTRACTOR

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 35 26.00 22

GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME)
05/21

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP A10.22	(2007; R 2017) Safety Requirements for Rope-Guided and Non-Guided Workers' Hoists
ASSP A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSP A10.44	(2020) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSP Z244.1	(2016) The Control of Hazardous Energy Lockout, Tagout and Alternative Methods
ASSP Z359.0	(2018) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSP Z359.1	(2016) The Fall Protection Code
ASSP Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSP Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSP Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSP Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSP Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSP Z359.16	(2016) Safety Requirements for Climbing Ladder Fall Arrest Systems
ASSP Z359.18	(2017) Safety Requirements for Anchorage Connectors for Active Fall Protection Systems
ASSP Z359.2	(2017) Minimum Requirements for a

	Comprehensive Managed Fall Protection Program
ASSP Z359.3	(2019) Safety Requirements for Lanyards and Positioning Lanyards
ASSP Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
ASSP Z359.6	(2016) Specifications and Design Requirements for Active Fall Protection Systems
ASSP Z359.7	(2019) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)

ASME B30.20	(2018) Below-the-Hook Lifting Devices
ASME B30.22	(2016) Articulating Boom Cranes
ASME B30.23	(2016) Personnel Lifting Systems Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings
ASME B30.26	(2015; R2020) Rigging Hardware
ASME B30.3	(2020) Tower Cranes
ASME B30.5	(2018) Mobile and Locomotive Cranes
ASME B30.7	(2016) Winches
ASME B30.8	(2015) Floating Cranes and Floating Derricks
ASME B30.9	(2018) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2019) 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	(2016) Guide for Protective Grounding of Power Lines
IEEE C2	(2017; Errata 1-2 2017; INT 1 2017) National Electrical Safety Code

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA Z535.2	(2011; R 2017) Environmental and Facility Safety Signs

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2018; ERTA 1-2 2018) Standard for Portable Fire Extinguishers
NFPA 241	(2019) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 306	(2019) Standard for Control of Gas Hazards on Vessels
NFPA 51B	(2019) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code
NFPA 70E	(2021) Standard for Electrical Safety in the Workplace

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)

TIA-222	(2018H; Add 1 2019) Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures
TIA-1019	(2012; R 2016) Standard for Installation, Alteration and Maintenance of Antenna Supporting Structures and Antennas

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 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
29 CFR 1926.552	Material Hoists, Personal Hoists, and Elevators
29 CFR 1926.553	Base-Mounted Drum Hoists
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
ATTACHMENT A	"CONTRACTOR CRANE, LHE,CONSTRUCTION EQUIPMENT, AND RIGGING GEAR REQUIREMENTS"

The attachment is included at the end of this Section. If the attachment is missing, notify the Contracting Officer.

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 29 CFR 1926 Subpart AA, 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 ASSP 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 ASSP 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, or 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 an LHE mishap or accident using the NAVFAC prescribed Navy Crane Center (NCC) accident 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. 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; G

Notifications and Reports; G

Accident Reports; G

LHE Inspection Reports; G

SD-07 Certificates

Contractor Safety Self-Evaluation Checklist; G

Crane Operators/Riggers; G

Standard Lift Plan; G

Critical Lift Plan; G

Activity Hazard Analysis (AHA); G

Confined Space Entry Permit; G

Hot Work Permit; G

Certificate of Compliance; G

License Certificates; G

Radiography Operation Planning Work Sheet; G

Portable Gauge Operations Planning Worksheet; 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 meeting. 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. The Contractor Safety Self-Evaluation checklist can be found on the Whole Building Design Guide website at www.wbdg.org/ffc/dod/unifiedfacilities-guide-specifications-ufgs/ufgs-01-35-26

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 applicable 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. Note the "Project Site" is the specific area of construction within the limits of work as defined by the Contract Documents.

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. The DR may not relieve an Alternate SSHO. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation. The primary SSHO may not be absent from the site for more than two weeks at one time and not more than 30 work days in a calendar year.

The SSHO must be trained in the use of hand-held fire extinguishers and fire prevention awareness. The Contractor must submit to the Government documentation of the SSHO's training. Hand-held fire extinguishers and fire prevention awareness must be included in the daily safety briefings with the Contractors personnel, and Sub-Contractors on site. The Contractor is responsible for their personnel and sub-contractors' personnel understanding how to use the hand-held fire extinguishers, fire protection awareness, and how to report a fire. A written log must be kept on-site documenting the daily hand-held fire extinguishers and fire prevention awareness.

1.7.1.2 Quality Control (QC) Manager:

The Quality Control Manager cannot be the SSHO on the project.

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 Activity Safety Office.

1.7.1.3.1 Competent Person for Confined Space Entry

Provide a Confined Space Competent Person (CP) 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 in accordance with

EM 385-1-1, Section 34.

If 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. 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.

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

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

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

1.7.1.5 Crane Operators/Riggers

Provide Operators, Signal Persons, and Riggers meeting the requirements in EM 385-1-1, Section 15.B for Riggers, and Section 16.B for Crane Operators and Signal Persons. 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.

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, and estimated and actual dates of corrections. Attach safety inspection logs to the Contractor's daily production report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use and maintain OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and Subcontractors, and make available to the Contracting Officer upon request. 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 meeting, 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 associated 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.

l. Monitor and provide daily briefings on fire prevention safety and provide hand-held fire extinguishers in areas readily visible and accessible to personnel. Monitor the expiration date and maintain working fully charged hand-held fire extinguishers.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above or any other required duties are not being effectively carried out. If either the Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out. The dismissal of the Superintendent, QC Manager, and/or SSHO will not be cause for claims for a Contract modification(s) for an extension to the Contract duration or for additional compensation.

1.7.3 Meetings

1.7.3.1 Preconstruction Meeting

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction meeting. 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 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 Collateral Duty Safety Officer's (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 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. Contractor's 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 trade/craft from interfering with or creating hazardous working conditions for other trades/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 meeting 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 twenty-four (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 ASSP 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 three (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. In addition, Critical Lift Plans are required for the following:

a. Lifts over 50 percent of the capacity of barge mounted mobile crane's hoist.

b. When working around energized power lines where the work will get closer than the minimum clearance distance in EM 385-1-1 Table 16-1.

c. For lifts with anticipated binding conditions.

d. When erecting cranes.

1.8.3.3.1 Critical Lift Plan Planning and Schedule

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.

1.8.3.3.2 Lifts of Personnel

In addition to the requirements of EM 385-1-1, Section 16.H.02, for lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

1.8.3.4 Multi-Purpose Machines, Material Handling Equipment, and Construction Equipment Lift Plan

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. Written approval from a qualified registered professional engineer, after a safety analysis is performed, is allowed in lieu of the OEM's approval. 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.

1.8.3.5 Fall Protection and Prevention (FP&P) Plan

The plan must be in accordance with the requirements of EM 385-1-1, Section 21.D and ASSP 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 (6) 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).

1.8.3.6 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSP 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.

1.8.3.7 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, ASSP Z244.1, and ASSP 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.

1.8.3.8 Lead, Cadmium, and Chromium Compliance Plan

Identify the safety and health aspects of work involving lead, cadmium, and chromium, including occupant protection and prepare in accordance with Section 02 83 00 LEAD, CADMIUM, AND CHROMIUM REMEDIATION.

1.8.3.9 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.

1.8.3.10 Polychlorinated Biphenyls (PCB) Plan

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

1.8.3.11 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 DEMOLITION 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

Prior to 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.07. 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 must be 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; and

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 in accordance with EM 385-1-1. 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 (24) 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, or any property damage. For LHE or rigging mishaps, notify the Contracting Officer as soon as practical but not more than four (4) hours after the mishap.

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 (if applicable). 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 Significant Incident Report (CSIR). The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: The Contracting Officer will provide the required forms. 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 the 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.

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.

1.14 HOT WORK

1.14.1 Permit and Personnel Requirements

Submit and obtain a written permit no later than two (2) working days prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Activity Fire Department. 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 (2) 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" performed at the 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 Activity Fire Department phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE ACTIVITY FIRE DEPARTMENT AND THE CONTRACTING OFFICER IMMEDIATELY.

a. Duration of Hot Work

At the discretion of the Activity Fire Inspectors, a hot work permit may be written for up to one work week, (Monday through Friday), provided work is being performed at one specific location and will not hinder any life safety code.

Hot work permits must be issued for five (5) work days with a time period not to exceed twelve (12) hours. Request for weekend permits must be submitted at least two (2) working days in advance of the work to be performed and will only be valid for the weekend requested.

b. Hot Work Within a Confined Space

Hot work permits within a confined space will be issued on a daily basis with a time period not to exceed a twelve (12) hour shift. All requests for hot work permits within a confined space must be received a minimum of two (2) complete working days prior to entry. A duplicate copy of the air monitoring results will be furnished to the fire inspector at time of issuance.

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.

1.14.3 Work Within 10 Feet of Mission Equipment

Provide 14 days advance notice to the Contracting Officer for work occurring within 10 feet of Mission Equipment to allow determination if Mission oversight for that portion of work will be required.

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. For AOR Facilities Only: (excludes portable machine sources of ionizing radiation including moisture density and X-Ray Fluorescence (XRF)). 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

For portable machine sources of ionizing radiation, including moisture density and XRF to be utilized at AOR Facilities, use and submit the Portable Gauge Operations Planning Worksheet instead.

The Contracting Officer and COT will review the submitted worksheet and provide 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. For gamma radiography materials and equipment, a Government escort is required for any travels on the Activity. The Navy COT or Government authorized representative will meet the Contractor at a designated location outside the Activity, ensure safety of the materials being transported, and will escort the Contractor for gamma sources onto the Activity, to the job site, and off the Activity. At AOR Activity's only, for portable machine sources of ionizing radiation, including moisture density and XRF, the Navy COT or Government authorized representative will meet the Contractor at the job site.

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 Activity 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 a 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 be scheduled only upon final approval from the local COTS or RSO Representative.

1.15.8 Transmitter Requirements

Adhere to the Activity 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.

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 HIGH NOISE LEVEL PROTECTION

Operations that involve the use of equipment with output of high noise levels (i.e. jackhammers, air compressors, and explosive-actuated devices) must be coordinated with the Contracting Officer. Use of any such equipment outside normal working hours must be approved in writing by the Contracting Officer prior to commencement of work.

1.18 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must comply with the applicable Storm Plan and:

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 minimum PPE includes:

a. Hard Hat

b. Long Pants

c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

e. Gloves

f. Safety Glasses

g. Hearing Protection

h. Fall Protection

i. Reflective Foul Weather Gear When Needed

j. Portable radios

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 Officer 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, 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 Activity.

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 the material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If the 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 UTILITY OUTAGE REQUIREMENTS

Apply for utility outages at least 15 calendar days in advance. At a minimum, the written request must include the location of the outage, utilities being affected, duration of outage, any necessary sketches, the location of the outage, LOTO boundaries, and a description of the means to fulfill energy isolation requirements in accordance with EM 385-1-1, Section 11.A.02 (Isolation). Some examples of energy isolation devices and procedures are highlighted in EM 385-1-1, Section 12.D. In accordance with EM 385-1-1, Section 12.A.01, where outages involve Government or Utility personnel, coordinate with the Government on all activities involving the control of hazardous energy.

These activities include, but are not limited to, a review of HECP and HEC procedures, as well as applicable Activity Hazard Analyses (AHAs). In accordance with EM 385-1-1, Section 11.A.02 and NFPA 70E, work on energized electrical circuits must not be performed without prior Government authorization. Government permission is considered through the permit process and submission of a detailed AHA. Energized work permits are considered only when de-energizing introduces additional or increased hazard or when de-energizing is infeasible.

3.3 OUTAGE COORDINATION MEETING

After the utility outage request is approved and prior to beginning work on the utility system requiring shut-down, conduct a pre-outage coordination meeting in accordance with EM 385-1-1, Section 12.A. This meeting must include the Prime Contractor, the Prime and Subcontractors performing the work, the Contracting Officer, and the AOR Activity representative. All parties must fully coordinate HEC activities with one another. During the coordination meeting, all parties must discuss and coordinate on the scope of work, HEC procedures (specifically, the lock-out/tag-out procedures for worker and utility protection), the AHA, assurance of trade personnel qualifications, identification of competent persons, and compliance with HECP training in accordance with EM 385-1-1, Section 12.C. Clarify when personal protective equipment is required during switching operations, inspection, and verification.

3.4 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, ASSP A10.44, NFPA 70E, and paragraph entitled HAZARDOUS ENERGY CONTROL PROGRAM (HECP) herein.

Contracting Officer will, upon request, apply lockout/tag-out 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.

No person, regardless of position or authority, must operate any switch, valve, or equipment that has an official lockout/tag-out tag attached to it, nor can such tag be removed except as provided in this Section.

No person must work on any equipment that requires a lockout/tag-out tag unless he/she, his/her immediate supervisor, project leader, or a subordinate has in his/her possession the stubs of the required lockout/tag-out tags.

When work is to be performed on electrical circuits, only qualified personnel are to perform work on electrical circuits.

A supervisor who is required to enter an area protected by a lockout/tag-out tag will be considered a member of the protected group provided he/she notifies the holder of the tag stub each time he/she enters and departs from the protected area.

Identification markings on building light and power distribution circuits must 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 must be secured in a passive condition with the appropriate vents, pins, and locks.

Pressurized or vacuum systems must be vented to relieve differential pressure completely.

Where dangerous gas or fluid systems are involved, or in areas where the environment may be oxygen deficient, system or areas must be purged, ventilated, or otherwise made safe prior to entry.

3.4.1 Safety Preparatory Inspection Coordination Meeting with the Government or Utility

For electrical distribution equipment that is to be operated by Government or Utility personnel, the Prime Contractor and the Subcontractor performing the work must attend the safety preparatory inspection coordination meeting, which will also be attended by the Contracting Officer's Representative, and required by EM 385-1-1, Section 12.A.02. The meeting will occur immediately preceding the start of work and following the completion of the outage coordination meeting. Both the safety preparatory inspection coordination meeting and the outage coordination meeting must occur prior to conducting the outage and commencing with lockout/tagout procedures.

3.4.2 Lockout/Tagout Isolation

Where the Government or Utility performs equipment isolation and lockout/tagout, the Contractor must place their own locks and tags on each energy-isolating device and proceed in accordance with the HECP. Before any work begins, both the Contractor and the Government or Utility must perform energy isolation verification testing while wearing required PPE detailed in the Contractor's AHA and required by EM 385-1-1, Sections 05.I and 11.B. Install personal protective grounds, with tags, to eliminate the potential for induced voltage in accordance with EM 385-1-1, Section 12.E.06.

3.4.3 Lockout/Tagout Removal

Upon completion of work, conduct lockout/tagout removal procedure in accordance with the HECP. In accordance with EM 385-1-1, Section 12.E.08, each lock and tag must be removed from each energy isolating device by the authorized individual or systems operator who applied the device. Provide formal notification to the Government (by completing the Government form if provided by Contracting Officer's Representative), confirming that steps of de-energization and lockout/tagout removal procedure have been conducted and certified through inspection and verification. Government or Utility locks and tags used to support the Contractor's work will not be removed until the authorized Government employee receives the formal notification.

3.5 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 ASSP Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.5.1 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 and using personal fall protection equipment. 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 ASSP Z359.2 in the AHA.

3.5.2 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, ASSP Z359.0, ASSP Z359.1, ASSP Z359.2, ASSP Z359.3, ASSP Z359.4, ASSP Z359.6, ASSP Z359.7, ASSP Z359.11, ASSP Z359.12, ASSP Z359.13, ASSP Z359.14, ASSP Z359.15, ASSP Z359.16, and ASSP Z359.18.

3.5.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection measures 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.

3.5.2.2 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. Equip all full body harnesses 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.

3.5.3 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 the use of conventional fall protection systems (personal fall arrest/restraint systems, guardrails, or safety nets) in accordance with EM 385-1-1, Section 21 and 29 CFR 1926.500. A safety monitoring system is not adequate fall protection and is not authorized.

(2) For work greater than 6 feet from the unprotected roof edge, in addition to the use of conventional fall protection systems the use of a warning line system is also permitted, in accordance with 29 CFR 1926.500 and EM 385-1-1, Section 21.L.

b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:12 (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.

3.5.4 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.

3.5.5 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.

3.5.6 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 be in accordance with the requirements of EM 385-1-1, ASSP Z359.2, and ASSP Z359.4.

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, and provide 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 a worker from climbing out of the 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)

The following requirements apply. In exception, these requirements do not apply to commercial truck mounted and articulating boom cranes used solely to deliver material and supplies (not prefabricated components, structural steel, or components of a systems-engineered metal building) where the lift consists of moving materials and supplies from a truck or trailer to the ground; to cranes installed on mechanics trucks that are used solely in the repair of shore-based equipment; to crane that enter the Activity but are not used for lifting; nor to other machines not used to lift loads suspended by rigging equipment. However, LHE accidents occurring during such operations must be reported.

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 Meeting. 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 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, except for employees required to handle the load.

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, the rigger, and the 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.

q. Follow FAA guidelines when required based on project location.

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 Base Mounted Drum Hoists

a. Operation of base mounted drum hoists must be in accordance with EM 385-1-1 and ASSP A10.22.

b. Rigging gear must be in accordance with applicable ASME/OSHA standards.

c. When used on telecommunication towers, base mounted drum hoists must be in accordance with TIA-1019, TIA-222, ASME B30.7, 29 CFR 1926.552, and 29 CFR 1926.553.

d. When used to hoist personnel, the AHA must include a written standard operating procedure. Operators must have a physical examination in accordance with EM 385-1-1 Section 16.B.05 and trained, at a minimum,

in accordance with EM 385-1-1 Section 16.U and 16.T. The base mounted drum hoist must also comply with OSHA Instruction CPL 02-01-056 and ASME B30.23.

e. Material and personnel must not be hoisted simultaneously.

f. Personnel cage must be marked with the capacity (in number of persons) and load limit in pounds.

g. Construction equipment must not be used for hoisting material or personnel or with trolley/tag lines. Construction equipment may be used for towing and assisting with anchoring guy lines.

3.7.5 Use of Explosives

Use of explosives is not allowed on the Activity.

3.8 EXCAVATIONS AND UTILITY LOCATING

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

3.8.1.1 General

Excavation or ground penetrating work is defined as any operation in which earth, rock, or other material below ground is moved or otherwise displaced, by means of power and hand tools, power equipment which includes grading, trenching, digging, boring, auguring, tunneling, scraping, and cable or pipe driving except tilling of soil, gardening, or displacement of earth, rock, or other material for agricultural purposes. Removal of bituminous concrete pavement or concrete is not considered excavation.

Ground penetrating work may include, but is not limited to, installing fence posts, probes, borings, piles, sign posts, stakes, or anchor rods of any kind that penetrates the soil more than 3-inches. The “Excavator” is defined as the person directly responsible for performing the excavation or ground penetrating work.

3.8.1.2 Underground Utilities Location

The Contractor/Excavator must fully comply with the State of Maine “DIG SAFE “law (Title 23, MRSA 3360-A). Existing underground utilities shown on the plans are based on PNS Yard Plates and are shown in their approximate locations only.

The Excavator must pre-mark the excavation area in “White Paint Only” (Field notes may be done in Pink paint). The Excavator must notify “DIG SAFE” (1-888-344-7233) at least within 14 calendar days, but no more than 30 calendar days prior to the commencement of the excavation or ground penetrating activity.

The Government will locate and mark the underground utilities within 14 calendar days of receiving the Dig Safe Notification.

Excavation or ground penetrating activities cannot commence until the utilities have been marked in the field and excavation has been approved by the Contracting Officer.

If the excavation or ground penetrating activities do not commence within 27 days of Dig Safe notification or the excavation work is expanded outside the location originally specified in the notification, the Excavator must re-notify Dig Safe, the Contracting Officer, and the PWD ME Dig Safe Coordinator.

The Contractor must maintain the utility markings throughout the Contract period. If additional markings are required, the Excavator must re-notify Dig Safe, the Contracting Officer, and the PWD ME Dig Safe Coordinator. Re-markings must be completed at the Contractor’s expense.

The Contractor must contact the PWD ME Dig Safe Coordinator (DSC) if there are any questions regarding the underground utilities or the Dig Safe notification.

3.8.1.3 Third Party Utility Locate

The Contractor must provide the services of a third party, qualified independent utility locating company/person(s) (Cannot be the Government’s Utility Locating Firm) to positively identify underground utilities in the work area. The third party independent locating firm is in addition to the PWD ME Dig Safe Process.

The Third Party review must be completed after the PWD ME Dig Safe Marking has been completed. Once the Third Party Locate Company has completed their review of the excavation area and the Government markings are confirmed, the Third Party Locate Company and Contractor must sign the Third Party Utility Locate Certification Form (Attachment C) and submit the form to the Contracting Officer prior to commencing excavation. If the Third Party Locate Company finds any discrepancies with the Government's utility markings, the Contractor must notify the Contracting Officer immediately.

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 coordinated with Activity utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. 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. Any markings made during the utility investigation must be maintained throughout the Contract.

3.8.4 Excavating with Hazardous or Mission Critical Utilities Within the Excavation Area

a. The Contractor must employ supplement daily Dig Safe procedures to include an additional checkoff on Contractor Daily Activity Plan asking if all utilities have been clearly marked and reviewed with the SSHO. The SSHO and the Excavator must complete and sign a UTILITY LOCATE - PRE-EXCAVATION SAFETY CHECKLIST (Attachment D). This checklist must be reviewed and signed by the PWD ME ET prior to the commencement of any excavation trenching work.

b. The Contractor must provide a Dig Safe laminated utility color coding system posted in or near all heavy digging equipment for easy reference to type of utility.

c. The SSHO must complete a pre-excavation walk as part of the morning procedure to help ensure all known utilities are identified and markings are refreshed with the appropriate color-coded paint. The Excavation/Trenching Competent person must complete the Contractor Daily Checklist for Trenching/Excavation included in Attachment E. The Daily Checklist must be completed prior to commencing excavation/trenching work and must be submitted with the CM/ET daily.

d. Contractor must provide additional danger signage, to mark areas of known live underground utilities.

e. Contractor must ensure a ‘spotter’ accompanies the equipment operator during excavation work.

f. Contractor must provide Construction CM/ET notification no later than 7 working days prior to the date of the preparatory and initial pre-excavation/demo safety review meeting.

g. The Contractor must confirm and identify the closest utility isolation points and develop mitigation strategies with the utility owner (Coordinate with the PWD ME DSC) to ensure the safe excavation adjacent to these utilities. Utility Outages to isolate utility systems may need to be considered in circumstances where the excavation work cannot be completed safely.

3.9 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, 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 and 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.

3.9.6 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for

the tool to be powered and protected from damage. Immediately remove from service all damaged extension cords. Portable extension cords must meet the requirements of EM 385-1-1, NFPA 70E, and OSHA electrical standards.

-- End of Section --

SECTION 01 35 29.13

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES
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.

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 85-115	(1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

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)

29 CFR 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response

1.2 PRECONSTRUCTION SAFETY CONFERENCE

Conduct a preconstruction safety conference prior to the start of site activities and after submission of the Accident Prevention Plan/Site Safety And Health Plan (APP/SSHP). The objective of the meeting is to discuss health and safety concerns related to the impending work, discuss project health and safety organization and expectations, review and answer comments and concerns regarding the APP/SSHP or other health and safety concerns. Ensure that those individuals responsible for health and safety at the project level are available and attend this meeting.

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-02 Shop Drawings

Work Zones; G
Decontamination Facilities; G

SD-03 Product Data

Amendments to the APP/SSHP; G
Exposure Monitoring/Air Sampling Program; G
Site Control Log; G
SSHO's Daily Inspection Logs; G

SD-07 Certificates

Certificate Of Worker/Visitor Acknowledgement; G

SD-11 Closeout Submittals

Safety And Health Phase-Out Report; G

1.4 ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN (APP/SSHP)

Develop and implement a Site Safety and Health Plan in accordance with Section 01 35 26.00 22 GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME), and attach to the Accident Prevention Plan (APP) as an appendix (APP/SSHP). Address all occupational safety and health hazards (traditional construction as well as contaminant-related hazards) associated with cleanup operations within the APP/SSHP. Cover each SSHP element in sections 28.A.01 and 33.B of EM 385-1-1 and each APP element in Appendix A of EM 385-1-1. There are overlapping elements in Section 28.A.01 and Appendix A of EM 385-1-1. SSHP appendix elements that overlap with APP elements need not be duplicated in the APP/SSHP provided each safety and occupational health (SOH) issue receives adequate attention and is documented in the APP/SSHP. The APP/SSHP is a dynamic document, subject to change as project operations/execution change. Modify the APP/SSHP to address changing and previously unidentified health and safety conditions. Ensure that the APP/SSHP is updated accordingly. Submit amendments to the APP/SSHP to the Contracting Officer as the APP/SSHP is updated. For long duration projects resubmit the APP/SSHP to the Contracting Officer annually for review. The APP/SSHP must contain all updates.

1.4.1 Acceptance and Modifications

Prior to submittal, the APP/SSHP must be signed and dated by the Safety and Health Manager and the Site Superintendent. Submit for review 7 days prior to the Preconstruction Safety Conference. Deficiencies in the APP/SSHP will be discussed at the preconstruction safety conference, and must be revised to correct the deficiencies and resubmitted for acceptance. Onsite work must not begin until the plan has been accepted. Maintain a copy of the written APP/SSHP onsite. Changes and modifications to the APP/SSHP must be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Bring to the attention of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer any unforeseen hazard that becomes evident during the performance of the work, through the Site Safety and Health Officer (SSHO) for resolution as soon as possible. In the interim, take necessary action to re-establish and maintain safe

working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted APP/SSHP is cause for stopping work until the matter has been rectified.

1.4.2 Availability

Make available the APP/SSHP in accordance with 29 CFR 1910.120, (b)(1)(v) and 29 CFR 1926.65, (b)(1)(v).

1.5 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

Provide hazardous waste operations and emergency response organization in accordance with EM 385-1-1, Section 33.

1.5.1 Safety and Health Manager

Safety and Health Manager must be an Industrial Hygienist certified by the American Board of Industrial Hygiene.

Apply the following in conjunction with the required qualifications and responsibilities stated in EM 385-1-1, Section 33.C.01.

1.5.1.1 Additional Qualifications

The Safety and Health Manager must have the following qualifications:

a. A minimum of 3 years experience in developing and implementing safety and occupational health programs at HTRW sites.

b. Documented experience in supervising professional and technician level personnel.

c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques.

d. Documented experience in managing personal protective equipment (PPE) programs and conducting PPE hazard evaluations for the types of activities and hazards likely to be encountered on the project.

e. Working knowledge of state and Federal occupational safety and health regulations.

1.5.1.2 Responsibilities and Duties

a. Development, implementation, oversight, and enforcement of the APP/SSHP.

b. Provide onsite consultation as needed to ensure the APP/SSHP is fully implemented.

c. Conduct initial site-specific training.

d. Be present at site during the first 3 days of remedial activities and at the startup of each new major phase of work.

e. Visit the site as needed and at least once per month for the duration of activities, to audit the effectiveness of the APP/SSHP.

f. Be available for emergencies.

g. Coordinate any modifications to the APP/SSHP with the Site Superintendent, the SSHO, and the Contracting Officer.

h. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.

i. Provide continued support for upgrading/downgrading of the level of personal protection.

j. Serve as a member of the quality control staff.

k. Review accident reports and results of daily inspections.

l. Sign and date the APP/SSHP prior to submittal.

1.5.2 Site Safety and Health Officer

Designate an individual and one alternate as the Site Safety and Health Officer (SSHO). Include the name, qualifications (education and training summary and documentation), and work experience of the Site Safety and Health Officer and alternate in the APP/SSHP.

The Apply the following in conjunction with the required qualifications and responsibilities stated in EM 385-1-1, Section 33.C.02.

1.5.2.1 Qualifications

The following requirements are in addition to those in Section 01 35 26.00 22 GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME).

a. A minimum of 1 year experience in implementing SOH programs at HTRW sites where modified Level D personal protective equipment was required.

b. Meet 29 CFR 1910.120/29 CFR 1926.65 requirements for 40-hour initial and 8-hour supervisor training and, maintain 8-hour refresher training requirements.

c. Specific training in personal and respiratory protective equipment, confined space entry and in the proper use of air monitoring instruments and air sampling methods including monitoring for ionizing radiation.

d. Documented experience in construction techniques and construction safety procedures.

e. Working knowledge of Federal and State Safety and Occupational Health (SOH) Regulations.

1.5.2.2 Responsibilities and Duties

The following requirements are in addition to those in Section 01 35 26.00 22 GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME).

a. Assist and represent the Safety and Health Manager in onsite training and the day to day onsite implementation and enforcement of the accepted APP/SSHP.

b. Be assigned to the site on a full time basis for the duration of field activities. The SSHO can have collateral duties in addition to SOH related duties. If operations are performed during more than 1 work shift per day, a site Safety and Health Officer must be present for each shift and when applicable, act as the radiation safety officer (RSO) as defined in paragraph 06.F.02 of EM 385-1-1 on radioactive waste cleanup projects.

c. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.

d. Have authority to ensure site compliance with specified SOH requirements, Federal, state and OSHA regulations and all aspects of the APP/SSHP including, but not limited to, activity hazard analyses, air monitoring, monitoring for ionizing radiation, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containment program, and preparation of records by performing a daily SOH inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.

e. In coordination with site management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

f. Consult with and coordinate any modifications to the APP/SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer.

g. Conduct daily safety inspection and document SOH findings into the Daily Safety Inspection Log. Track noted SOH deficiencies to ensure that they are corrected.

h. Conduct accident investigations and prepare accident reports.

i. Serve as a member of the quality control staff on matters relating to SOH.

1.5.3 Additional Certified Health and Safety Support Personnel

Retain industrial hygiene support from an industrial hygienist certified by the American Board of Industrial Hygiene to develop occupational health practices for the APP/SSHP and, if necessary, visit the site to help implement APP/SSHP requirements.

1.5.4 Occupational Physician

Utilize the services of a licensed physician, who is certified in occupational medicine by the American Board of Preventative Medicine, or who, by necessary training and experience is Board eligible. The physician must be familiar with the site's hazards and the scope of this project. Include the medical consultant's name, qualifications, and knowledge of the site's conditions and proposed activities in the APP/SSHP. The physician is responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1910.120, (f) and 29 CFR 1926.65, (f)

and paragraph MEDICAL SURVEILLANCE PROGRAM.

1.5.5 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency must be onsite at all times during site operations. They must be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but must be immediately available to render first aid when needed.

1.5.6 Safety and Health Technicians

For each work crew in the exclusion zone, one person, designated as a Safety and Health technician, must perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. They must have appropriate training equivalent to the SSHO in each specific area for which they have responsibility and report to and be under the supervision of the SSHO.

1.6 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

Develop and implement an Emergency Response Plan, that meets the requirements of EM 385-1-1 Section 33.G, 29 CFR 1910.120 (l) and 29 CFR 1926.65 (l), as a section of the APP/SSHP. In the event of any emergency associated with remedial action, without delay, alert all onsite employees and as necessary offsite emergency responders that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Contracting Officer; and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Train employees that are required to respond to hazardous emergency situations to their level of responsibility according to 29 CFR 1910.120 (q) and 29 CFR 1926.65 (q) requirements. Rehearse the plan regularly as part of the overall training program for site operations. Review the plan periodically and revised as necessary to reflect new or changing site conditions or information. Provide copies of the Emergency Response Portion of the accepted APP/SSHP to the affected local emergency response agencies. Address, as a minimum, the following elements in the plan:

a. Pre-emergency planning. Coordinate with local emergency response providers during preparation of the Emergency Response Plan. At a minimum, coordinate with local fire, rescue, hazardous materials response teams, police and emergency medical providers to assure all organizations are capable and willing to respond to and provide services for on-site emergencies. Ensure the Emergency Response Plan for the site is compatible and integrated with the local fire, rescue, medical and police security services available from local emergency response planning agencies.

b. Personnel roles, lines of authority, communications for emergencies.

c. Emergency recognition and prevention.

d. Site topography, layout, and prevailing weather conditions.

e. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and

control).

f. Route maps to nearest prenotified medical facility. Site-support vehicles must be equipped with maps. At the beginning of project operations, drivers of the support vehicles must become familiar with the emergency route and the travel time required.

g. Specific procedures for decontamination and medical treatment of injured personnel.

h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, Federal, state, and local environmental agencies; as well as Safety and Health Manager, the Site Superintendent, the Contracting Officer and their alternates).

i. Criteria for initiating community alert program, contacts, and responsibilities.

j. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate government agencies must be immediately notified. In addition, verbally notify the Contracting Officer and the local district safety office immediately and submit a written notification within 24 hours. Include within the report the following items:

(1) Name, organization, telephone number, and location of the Contractor.

(2) Name and title of the person(s) reporting.

(3) Date and time of the incident.

(4) Location of the incident, i.e., site location, facility name.

(5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.

(6) Cause of the incident, if known.

(7) Casualties (fatalities, disabling injuries).

(8) Details of any existing chemical hazard or contamination.

(9) Estimated property damage, if applicable.

(10) Nature of damage, effect on contract schedule.

(11) Action taken to ensure safety and security.

(12) Other damage or injuries sustained, public or private.

k. Procedures for critique of emergency responses and follow-up.

1.7 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a certificate of worker/visitor acknowledgement must be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the Example Certificate Of Worker/Visitor Acknowledgement at the end of this section.

1.8 INSPECTIONS

Attach to and submit with the Daily Quality Control reports the SSHO's Daily Inspection Logs. Include with each entry the following: date, work area checked, employees present in work area, PPE and work equipment being used in each area, special SOH issues and notes, and signature of preparer.

1.9 SAFETY AND HEALTH PHASE-OUT REPORT

Submit a Safety and Health Phase-Out Report in conjunction with the project close out report, prior to final acceptance of the work. Include the following minimum information :

a. Summary of the overall performance of SOH (e.g., accidents or incidents including near misses, unusual events, lessons learned).

b. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on site facilities.

c. Summary of exposure monitoring and air sampling accomplished during the project.

d. Signatures of Safety and Health Manager and SSHO.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

Comply with EM 385-1-1, 29 CFR 1926.65, 29 CFR 1910.120, OSHA requirements in 29 CFR 1910 and 29 CFR 1926 with work performed under this contract, and state specific OSHA requirements where applicable. Submit to the Contracting Officer for resolution matters of interpretation of standards before starting work. The most stringent requirements apply where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary.

2.2 PERSONAL PROTECTIVE EQUIPMENT

2.2.1 Site Specific PPE Program

Provide onsite personnel exposed to contaminants with appropriate personal protective equipment. Components of levels of protection (B, C, D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Use only respirators approved by NIOSH.

Keep protective equipment and clothing clean and well maintained. Include site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators, cleaning, maintenance, inspection, cartridge change out, and storage of PPE within the PPE section of the APP/SSHP.

2.2.2 Levels of Protection

The Safety and Health Manager must establish and evaluate as the work progresses the levels of protection for each work activity. Also establish action levels for upgrade or downgrade in levels of PPE. Describe in the SSHP the protocols and the communication network for changing the level of protection. Address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, and individual medical considerations within the PPE evaluation protocol.

2.2.2.1 Initial PPE Components

The following items constitute initial minimum protective clothing and equipment ensembles.

Modified Level D	Nitrile gloves, disposable botties, personal air monitoring and a hand/face wash station.

2.2.3 PPE for Government Personnel

Two clean sets of personal protective equipment and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the Exclusion Zone and Contamination Reduction Zone, must be available for use by the Contracting Officer or official visitors. The items must be cleaned, maintained and stored on-site and clearly marked: "FOR USE BY GOVERNMENT ONLY." Provide basic training in the use and limitations of the PPE provided.

2.3 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

Maintain, as a minimum, the following items onsite and available for immediate use:

a. First aid equipment and supplies approved by the consulting physician.

b. Provide fire extinguishers of sufficient size and type at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

PART 3 EXECUTION

3.1 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

3.1.1 Project/Site Conditions

Refer to the Final Record of Decision Report attached to the end of this section for the site description and contamination characterization.

3.2 TASK SPECIFIC HAZARDS, INITIAL PPE, HAZWOPER MEDICAL SURVEILLANCE AND TRAINING APPLICABILITY

Task specific occupational hazards, task specific HAZWOPER medical surveillance and training applicability and task specific initial PPE requirements for the project are listed on the Task Hazard and Control Sheets at the end of this section. Reevaluate occupational safety and health hazards as the work progresses and to adjust the PPE and onsite

operations, if necessary, so that the work is performed safely and in compliance with occupational safety and health regulations.

3.3 TRAINING

In conjunction with EM 385-1-1, Section 33D, meet the training program requirements for workers performing cleanup operations and who will be exposed to contaminants.

3.3.1 General HTRW Operations Training

All Personnel performing duties with potential for exposure to onsite contaminants must meet and maintain the following 29 CFR 1910.120/ 29 CFR 1926.65 (e) training requirements:

a. 40 hours of off site HTRW instruction.

b. 3 days actual on-the-job field experience under the direct supervision of a trained, experienced supervisor.

c. 8 hours refresher training annually.

Onsite supervisors must have an additional 8 hours management and supervisor training specified in 29 CFR 1910.120/29 CFR 1926.65 (e) (4).

3.3.2 Pre-Entry Briefing

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone, must attend a site-specific SOH training session. This session will be conducted by the Safety and Health Manager and the Site Safety and Health Officer to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Thoroughly discuss procedures and contents of the accepted APP/SSHP and Sections 01.B.02 and 28.D.03 of EM 385-1-1. Each employee must sign a training log to acknowledge attendance and understanding of the training. Notify the Contracting Officer at least 5 days prior to the initial site-specific training session so government personnel involved in the project may attend.

3.3.3 Periodic Sessions

Conduct periodic onsite training by the SSHO at least weekly for personnel assigned to work at the site during the following week. Address SOH procedures, work practices, any changes in the APP/SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents. Convene a meeting prior to implementation of the change should an operational change affecting onsite field work be made, to explain SOH procedures. Conduct a site-specific training sessions for new personnel, visitors, and suppliers by the SSHO using the training curriculum outlines developed by the Safety and Health Manager. Each employee must sign a training log to acknowledge attendance and understanding of the training.

3.4 MEDICAL SURVEILLANCE PROGRAM

Meet all requirements of 29 CFR 1910.120/29 CFR 1926.65 medical surveillance program and EM 385-1-1, Section 33.G for workers performing cleanup operations and who will be exposed to contaminants. Ensure the

Occupational Physician or the physician's designee performs the physical examinations and reviews examination results. Participation in the medical surveillance program is without cost to the employee, without loss of pay and at a reasonable time and place.

3.5 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Prepare and implement by the Safety and Health Manager an exposure monitoring/air sampling program to identify and quantify SOH hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. Include action levels for upgrading/downgrading PPE in the program. Monitor for the following aerosolized contaminants: Lead.

3.6 HEAT STRESS MONITORING AND MANAGEMENT

Document in the APP/SSHP and implement the procedures and practices in section 06.J. in EM 385-1-1 to monitor and manage heat stress.

3.7 SITE CONTROL MEASURES

Coordinate site control measures with Section 01 57 19.00 20 TEMPORARY ENVIRONMENT CONTROLS (AOR).

3.7.1 Work Zones

Initial anticipated work zone boundaries (exclusion zone, contamination reduction zone, support zone, all access points and decontamination areas) are to be clearly delineated on the site drawings. Base delineation of work zone boundaries on the contamination characterization data and the hazard/risk analysis to be performed as described in EM 385-1-1 06.A.02. As work progresses and field conditions are monitored, work zone boundaries may be modified (and site drawings modified) with approval of the Contracting Officer. Clearly identify work zones and mark in the field (using fences, tape, or signs). Submit and post a site map, showing work zone boundaries and locations of decontamination facilities in the onsite office. Work zones must consist of the following:

3.7.1.1 Exclusion Zone (EZ)

The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Control entry into this area and exit may only be made through the Contamination Reduction Zone (CRZ).

3.7.1.2 Contamination Reduction Zone (CRZ)

The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas must be separate and unique areas located in the CRZ.

3.7.1.3 Support Zone (SZ)

The Support Zone is defined as areas of the site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from HTRW operations. Secure the Support Zone against active or passive contamination. Site offices, parking areas, and other support

facilities must be located in the Support Zone.

3.7.2 Site Control Log

A log of personnel visiting, entering, or working on the site must be maintained. Include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable). Before visitors are allowed to enter the Contamination Reduction Zone or Exclusion Zone, they must show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and fill out a Certificate of Worker or Visitor Acknowledgment. Record this visitor information, including date, in the log.

3.7.3 Communication

Provide and install an employee alarm system that has adequate means of on and off site communication in accordance with 29 CFR 1910 Section .165. The means of communication must be able to be perceived above ambient noise or light levels by employees in the affected portions of the workplace. The signals must be distinctive and recognizable as messages to evacuate or to perform critical operations. This includes: Walkie talkies, radios, or telephones.

3.7.4 Site Security

Provide the following site security: Print signs in bold large letters on contrasting backgrounds. Signs must be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering.

3.8 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed to hazardous chemical vapors, gases, liquids, or contaminated solids must decontaminate themselves and their equipment prior to exiting the contamination reduction zone (CRZ) and entering the support zone. Consult Chapter 10.0 of NIOSH 85-115 when preparing decontamination procedures. Submit a detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers as part of the APP/SSHP. Train employees in the procedures and enforce the procedures throughout site operations.

3.8.1 Decontamination Facilities

Submit drawings showing the layout of the personnel and equipment decontamination areas.

3.8.2 Personnel Decontamination

Initially set up a decontamination line in the CRZ. Employees must exit the exclusion zone through the CRZ and implement the following decontamination procedures and techniques: hand and face wash. Showers, if needed, must comply with 29 CFR 1910, Section.141 and EM 385-1-1, 02 F, Washing Facilities. It is the Site Safety and Health Officer's responsibility to recommend techniques to improve personnel decontamination procedures, if necessary.

3.8.3 Equipment Decontamination

Decontaminate the vehicles and equipment used in the EZ in the CRZ prior to leaving the EZ.

3.8.3.1 Facilities for Equipment and Personnel

Provide a vehicle/equipment decontamination station within the CRZ for decontaminating vehicles and equipment leaving the EZ. Construct a decontamination station pad, which meets the site decontamination needs for all vehicles and larger equipment decontamination. Construct the pad to capture decontamination water, including overspray, and allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. Perform dry decontamination using a broom to remove dry/loose spilled materials on accessible surfaces. Provide a designated "clean area" in the CRZ for performing equipment maintenance. Use this area when personnel are required by normal practices to come in contact with the ground, i.e., crawling under a vehicle to change engine oil. Equipment within the EZ or CRZ must be decontaminated before maintenance is performed.

3.8.3.2 Procedures

Procedures for equipment decontamination must be developed and utilized to prevent the spread of contamination into the SZ and offsite areas. These procedures must address disposal of contaminated products and spent materials used on the site, including, as a minimum, containers, fluids, and oils. Assume any item taken into the EZ to be contaminated and perform an inspection and decontaminate. Vehicles, equipment, and materials must be cleaned and decontaminated prior to leaving the site. Handle construction material in such a way as to minimize the potential for contaminants being spread or carried offsite. Prior to exiting the site, vehicles and equipment must be monitored to ensure the adequacy of decontamination.

Task Hazard and Control Requirements Sheet	
Task	Remove lead contaminated soil.
Initial Anticipated Hazards	Ingestion.
Initial PPE	Nitrile gloves, disposable booties.
Initial Controls	Hand and face washing.
Initial Exposure Monitoring	Personal air monitoring.
No	HAZWOPER Medical Surveillance Required
No	HAZWOPER Training Required

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
02/19

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization (e.g., ASTM B564 Standard Specification for Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
444 North Capital Street, NW, Suite 249
Washington, DC 20001
Ph: 202-624-5800
Fax: 202-624-5806
E-Mail: info@aashto.org
Internet: https://www.transportation.org/

AMERICAN HARDBOARD ASSOCIATION (AHA)
1210 West Northwest Highway
Palatine, IL 60067
Ph: 847-934-8800
Fax: 847-934-8803
E-mail: aha@hardboard.org
Internet: http://domensino.com/AHA/

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)
1791 Tullie Circle, NE
Atlanta, GA 30329
Ph: 404-636-8400 or 800-527-4723
Fax: 404-321-5478
E-mail: ashrae@ashrae.org
Internet: https://www.ashrae.org/

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)
520 N. Northwest Highway
Park Ridge, IL 60068
Ph: 847-699-2929
E-mail: customerservice@assp.org
Internet: https://www.assp.org/

AMERICAN WATER WORKS ASSOCIATION (AWWA)
6666 W. Quincy Avenue
Denver, CO 80235 USA
Ph: 303-794-7711 or 800-926-7337
Fax: 303-347-0804
Internet: https://www.awwa.org/

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: https://www.astm.org/

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
933 North Plum Grove Road
Schaumburg, IL 60173-4758
Ph: 847-517-1200
Fax: 847-517-1206
Internet: http://www.crsi.org/

GREEN SEAL (GS)
1001 Connecticut Avenue, NW
Suite 827
Washington, DC 20036-5525
Ph: 202-872-6400
Fax: 202-872-4324
E-mail: greenseal@greenseal.org
Internet: https://www.greenseal.org/

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 and 501 Hoes Lane
Piscataway, NJ 08854-4141
Ph: 732-981-0060 or 800-701-4333
Fax: 732-981-9667
E-mail: onlinesupport@ieee.org
Internet: https://www.ieee.org/

MASTER PAINTERS INSTITUTE (MPI)
2800 Ingleton Avenue
Burnaby, BC CANADA V5C 6G7
Ph: 1-888-674-8937
Fax: 1-888-211-8708
E-mail: info@paintinfo.com or techservices@mpi.net
Internet: http://www.mpi.net/

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
1300 North 17th Street, Suite 900
Arlington, VA 22209
Ph: 703-841-3200
Internet: https://www.nema.org

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 800-344-3555
Fax: 800-593-6372

Internet: https://www.nfpa.org

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)
Patriots Plaza 1
395 E Street, SW, Suite 9200
Washington, DC 20201
Ph: 800-232-4636
Fax: 513-533-8347
Internet: https://www.cdc.gov/niosh/

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)
100 Bureau Drive
Gaithersburg, MD 20899
Ph: 301-975-2000
Internet: https://www.nist.gov/

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
4201 Lafayette Center Drive
Chantilly, VA 20151-1219
Ph: 703-803-2980
Fax: 703-803-3732
Internet: https://www.smacna.org/

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)
1320 North Courthouse Rosd, Suite 200
Arlington, VA 22201
Ph: 703-907-7700
Fax: 703-907-7727
E-mail: marketing@tiaonline.org
Internet: https://www.tiaonline.org/

U.S. ARMY CORPS OF ENGINEERS (USACE)
CRD-C DOCUMENTS available on Internet:
http://www.wbdg.org/ffc/army-coe/standards
Order Other Documents from:
Official Publications of the Headquarters, USACE
E-mail: hqpublications@usace.army.mil
Internet: http://www.publications.usace.army.mil/
or
https://www.hnc.usace.army.mil/Missions/Engineering-Directorate/TECHINFO/

U.S. DEPARTMENT OF AGRICULTURE (USDA)
Order AMS Publications from:
AGRICULTURAL MARKETING SERVICE (AMS)
Seed Regulatory and Testing Branch
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193
Ph: 704-810-8884
E-mail: PA@ams.usda.gov
Internet: https://www.ams.usda.gov/
Order Other Publications from:
USDA Rural Development
Rural Utilities Service
STOP 1510, Rm 5135
1400 Independence Avenue SW
Washington, DC 20250-1510
Phone: (202) 720-9540

Internet:
https://www.rd.usda.gov/about-rd/agencies/rural-utilities-service

U.S. DEPARTMENT OF DEFENSE (DOD)
Order DOD Documents from:
Room 3A750-The Pentagon
1400 Defense Pentagon
Washington, DC 20301-1400
Ph: 703-571-3343
Fax: 215-697-1462
E-mail: customerservice@ntis.gov
Internet: https://www.ntis.gov/
Obtain Military Specifications, Standards and Related Publications from:
Acquisition Streamlining and Standardization Information System (ASSIST)
Department of Defense Single Stock Point (DODSSP)
Document Automation and Production Service (DAPS)
Building 4/D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Ph: 215-697-6396 - for account/password issues
Internet: https://assist.dla.mil/online/start/; account registration required
Obtain Unified Facilities Criteria (UFC) from:
Whole Building Design Guide (WBDG)
National Institute of Building Sciences (NIBS)
1090 Vermont Avenue NW, Suite 700
Washington, DC 20005
Ph: 202-289-7800
Fax: 202-289-1092
Internet:
https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004
Ph: 202-564-4700
Internet: https://www.epa.gov
--- Some EPA documents are available only from:
National Technical Information Service (NTIS)
5301 Shawnee Road
Alexandria, VA 22312
Ph: 703-605-6060 or 1-800-363-2068
Fax: 703-605-6880
TDD: 703-487-4639
E-mail: info@ntis.gov
Internet: https://www.ntis.gov/

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)
Order for sale documents from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: https://www.gpo.gov/
Order free documents from:

U.S. Department of Transportation
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591
Ph: 866-835-5322
Internet: https://www.faa.gov/

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)
1200 New Jersey Ave., SE
Washington, DC 20590
Ph: 202-366-4000
E-mail: ExecSecretariat.FHWA@dot.gov
Internet: https://www.fhwa.dot.gov/
Order from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: https://www.gpo.gov/

U. S. GREEN BUILDING COUNCIL (USGBC)
2101 L St NW, Suite 500
Washington, DC 20037
Ph: 202-828-7422
Internet: https://new.usgbc.org/

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Internet: https://www.archives.gov/
Order documents from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: https://www.gpo.gov/

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 45 00.00 22

QUALITY CONTROL (PWD ME)
05/21

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) 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

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED GBDC	(2009) LEED Reference Guide for Green Building Design and 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. 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.

QC Manager Qualifications; G

QC Specialist Qualifications; G

SD-07 Certificates

Contractor QC Self-Evaluation Checklist; G

1.3 INFORMATION FOR THE CONTRACTING OFFICER

Prior to commencing work on construction, 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: Submit the report electronically by 10:00 AM the next working day after each day that work is performed and for every seven (7) 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 (7) 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 (2) 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 eOMSI preparer for inclusion into the eOMSI 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 (2) 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.

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, historic coordination drawings review and approval, testing, completion inspections, QC certifications, independent Special Inspections in accordance with Section 01 45 35 SPECIAL INSPECTIONS, 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 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 an officer of the firm and not be subordinate to the Project Superintendent, or the Project Manager. 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. The QC Manager will be subject to removal by the Contracting Officer for non-compliance with the QC requirements specified in the Contract, failure to perform the duties of the QC Manager specified herein, or failure to manage the QC program. The removal and replacement of the QC Manager will not be cause for claim of additional compensation or extensions of the Contract Completion Date (CCD).

1.4.1 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. The removal and replacement of QC organization personnel will not be cause for claim of additional compensation or extensions of the Contract Completion Date (CCD).

1.4.2 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.

1.4.3 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.

1.5 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 QC Manager must not perform the duties of Project Superintendent, nor the duties of Project Manager, or SSHO. 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 and must not be the Special Inspector.

1.5.1.2 Qualifications

An individual with a minimum of 10 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.

1.5.2 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.

1.5.3 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.

1.5.4 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 at the frequency specified below. QC Specialists must not be the special inspector.

Qualification / Experience in Submittal Discipline	Submittals to be reviewed:	
	Section No	Submittal
Certified Industrial Hygienist (CIH)/ Comprehensive practice with 5 years experience in lead	02 83 00 LEAD, CHROMIUM, AND CADMIUM REMEDIATION	-Containment Structures -Qualifications -Abatement Procedures
Certified Industrial Hygienist (CIH) / Comprehensive practice with 5 years experience in PCBs	02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs)	-Containment Structures -Qualifications -Abatement Procedures

1.6 QUALITY CONTROL (QC) PLAN

1.6.1 Construction Quality Control (QC) Plan

Submit a Construction QC Plan prior to start of construction.

1.6.1.1 Requirements

Provide, for acceptance by the Contracting Officer, a Construction QC Plan, prior to start of construction, that includes a table of contents, with major sections identified, with pages numbered sequentially, and that documents the proposed methods and responsibilities for accomplishing quality control 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. Example: The fire protection engineer who designs the sprinkler system.

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 Network Analysis Schedule (NAS). Include all activities for which this specification requires QC Specialists or specialty inspection personnel. Provide separate DFOWs in the NAS 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 must 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: A personnel matrix showing for each Section of the specification who will review and approve submittals, who will perform and document the three phases of control, and who will perform and document the testing.

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. Include 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 who attended the training.

p. ORGANIZATION AND PERSONNEL CERTIFICATIONS LOG: Procedures for coordinating, tracking and documenting all certifications on Subcontractors, testing laboratories, suppliers, personnel, etc. QC Manager must 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.

q. DAILY CONTRACTOR QUALITY CONTROL REPORT FORM: Template that includes fields for the following:

1) Date.
2) Sequential report number.
3) Weather and temperature.
4) Number of personnel on site by trade or by Subcontract.
5) Kind and number of major equipment on site.
6) Tests performed and their results, if known.
7) Materials and equipment delivered to the site and their conditions.
8) Names, affiliations, and positions of visitors to the site with brief explanations of the reasons for visits.
9) Brief description of each work activity, noting items that were completed that day.
10) Items of work that need attention at a later date, and why.
11) Any accidents and injuries.
12) Items of concern with respect to maintenance of quality.
13) Accounting update of unit price items specified in Section 00 41 00 BID SCHEDULES utilizing the numbering convention indicated in the Unit Prices Form (e.g., 0001g).
14) Any other items of significance.

1.7 QC PLAN MEETINGS

Prior to submission of the QC Plan, the QC Manager will meet 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 list of DFOWs.

1.8 COORDINATION AND MUTUAL UNDERSTANDING MEETING

After submission of the QC Plan, and prior to Government approval and the start of construction, the QC Manager must 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.

1.8.1 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, environmental requirements and procedures, coordination of activities to be performed, and the coordination of the management, production, and QC personnel. At the meeting, explain in detail how the 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 Management Plan.

e. Environmental regulatory requirements.

1.8.2 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.

1.8.3 Attendees

As a minimum, the personnel required to attend include an officer of the firm, the Project Manager, Project Superintendent, QC Manager, Alternate QC Manager, QC Specialists, A/E (DOR), Environmental Manager, and Subcontractor representatives as approved by the Contracting Officer. 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, the A/E (DOR), and the Contracting Officer. Provide a copy of the signed minutes to all attendees and must be included in the QC Plan.

1.9 QC MEETINGS

After the start of construction, conduct weekly QC meetings by the QC Manager at the work site with the Project Superintendent, the QC Specialists, and the foremen who are performing the work of the DFOWs. The QC Manager must prepare the minutes of the meeting and provide a copy to the Contracting Officer within two (2) 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 items (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 and confirm status of accounting of unit price items specified in Section 00 41 00 BID SCHEDULES.

n. Review Non-Compliance Notices and any actions required to address non-complaint work/actions.

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

The meeting must be conducted by the QC Manager and attended by the QC Specialists, the Project Superintendent, the Project SSHO, and the foreman responsible for the DFOW or as approved by the Contracting Officer. 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 (Note: Preparatory Meeting must only be held if the shop drawings or submittals have been approved, hard copies are printed for the meeting, the APP and appropriate AHA related to the DFOW have been submitted, and the appropriate personnel as stated above are present for the meeting):

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 and applicable required A/E (DOR) Quality Assurance Inspections.

e. Examine the work area to ensure that the required preliminary work has been completed.

f. 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.

g. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that required Safety Data Sheets (SDS) are submitted.

h. Discuss specific controls used and construction methods, construction tolerances, layout/survey controls (horizontal and vertical controls) necessary, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying

potential problems for each DFOW.

i. Discuss the QC documentation required to be collected as part of the work.

j. Identify any changed conditions or modifications that may impact the execution of the work.

k. Review the processes/strategies that will be implemented to address any issues if the work does not go as planned or if any unforeseen conditions are encountered or if any changes arise that may impact the successful execution of the work.

l. Review the listing of Government QA inspections that may be implemented as part of the execution of the work.

m. If work includes demolition work, review demolition work plan to ensure compliance with EM 385-1-1 Section 23 Demolition, Renovation and Re-Occupancy.

n. If work includes excavation, review Utility Locating Requirements. (Note: Special attention is required if Hazardous or Mission Critical Utilities are within the excavation area.) If Hazardous and Mission Critical Utilities (as identified in the Scope of Work and Contract Drawings) are located within the excavation area, the Activity Utility Department, PWD ME CM/ET, PWD ME Design Manager (DM), and the assigned PWD ME Project Civil Engineer must be present at the meeting to review requirements to ensure safety and preservation of critical utilities is discussed with adequate focus.

o. If work includes excavation, review Soil Management Requirements.

p. If the work is subject to any environmental (EV) permitting, Archaeological Monitoring, or SHPO approvals, review the terms and conditions of the applicable permits as well as any supplemental controls/approvals that are required to complete the work. (Note: Include Activity Environmental Representatives at this meeting to review the project specific requirements.)

q. If work includes the removal and disposal of Hazardous materials, review the appropriate work plans to ensure the work plans have been approved and any comments are understood by the work execution team. (Note: Include Activity Environmental Representatives at this meeting to discuss Hazardous Materials handling and disposal processes and procedures.)

1.10.2 Initial Phase

Notify the Contracting Officer at least two (2) 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 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. Resolve conflicts.

d. Ensure that testing is performed by the approved laboratory.

e. Check work procedures for compliance with the APP and the appropriate AHA to ensure that applicable safety requirements are met.

f. Review project specific work plans (i.e. HAZMAT Abatement, Stormwater Management) to ensure all preparatory work items have been completed and documented.

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. Assure applicable required A/E (DOR) Quality Assurance Inspections are scheduled.

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 (2) 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. The testing and retesting must be performed at no additional cost to the Government.

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 https://www.nist.gov/nvlap, the American Association of State Highway and Transportation Officials (AASHTO) program at http://www.aashtoresource.org/aap/overview, International Accreditation Services, Inc. (IAS) at http://www.iasonline.org, U. S. Army Corps of Engineers Materials Testing Center (MTC) at http://www.erdc.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/9254/Article/476661/materials-testing-center.aspx, and the American Association for Laboratory Accreditation (A2LA) program at http://www.a2la.org/.

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, per the paragraph entitled 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 eOMSI preparer for inclusion into the eOMSI documentation, in accordance with Sections 01 78 23 OPERATION AND MAINTENANCE DATA and 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND

MAINTENANCE SUPPORT INFORMATION (eOMSI).

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 eOMSI preparer for inclusion into the eOMSI 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 CxC (if applicable) 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 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 must 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 (CCD) 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 QC Manager, the Project Superintendent, the CxC, and others deemed necessary must be present. Attendees for the Government will include the Contracting Officer, other FEAD 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 entitled INFORMATION FOR THE CONTRACTING OFFICER herein must 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, a record of visitors to the work site, quality control problem areas, deviations from the QC Plan, construction deficiencies encountered, and 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 an electronic folder. Divide folder into a series of tabbed sections as shown below. Ensure folder is updated at each required progress meeting. This information 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.

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 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 entitled INFORMATION FOR THE CONTRACTING OFFICER. Provide a copy of the final "Testing Plan and Log" to the eOMSI preparer for inclusion into the eOMSI 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 00.00 22 CLOSEOUT SUBMITTALS (PWD ME) 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 must 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, must be 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.

1.17 CONSTRUCTION INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN

Submit an IAQ Management Plan within 15 calendar days after Contract Award and not less than 10 calendar days before the preconstruction meeting. Revise and resubmit the 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 of two (2) weeks with MERV-13 filtration media as determined by ASHRAE 52.2 at 100 percent outside air, or in accordance with LEED GBDC. Air contamination testing must be consistent with EPA's current Compendium of Methods for the Determination of Air Pollutants in Indoor Air, and with the LEED GBDC. 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.

1.17.3 Contractor QC Self-Evaluation Checklist

Contracting Officer will provide a "Contractor QC Self-Evaluation Checklist" to the Contractor at the pre-construction meeting. 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. The Government will randomly perform QC inspections following the provided checklist. If the Government inspection score is less than 90 the Government will withhold 10 percent from the next invoice.

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 00.00 22

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS (PWD ME)
03/22

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.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2019) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1	(2016; Rev L; Change 2) Obstruction Marking and Lighting

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009; Rev 2012) Manual of 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

Construction site plan; G

Traffic control plan; G

Haul Road Plan; G

Contractor Computer Cybersecurity Compliance Statements; G

Contractor Temporary Network Cybersecurity Compliance Statements; G

1.3 CONSTRUCTION SITE PLAN

Prior to the start of work, submit for Government approval a site construction plan showing the locations and dimensions of temporary facilities (including layouts and details and equipment and material onsite and offsite storage areas), access and haul routes, avenues of ingress/egress to the fenced area and details of the temporary construction safety fencing/barriers systems that complies with EM 385-1-1 Sections 4 and 8.

Identify any areas where vehicle track pads will be installed to prevent the tracking of mud onto the pavement outside the project site limits. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and dewatering system storage tanks and infiltration pits.

Prior to the start of Construction, furnish and erect temporary project safety fencing at the work site in accordance with the plans and the following requirements:

a. Temporary project fencing (or a substitute acceptable to the Contracting Officer (GDA) and delineated in the APP) must be provided on all projects. See also EM 385-1-1 Sections 4 and 8.

b. Fencing must extend from grade to a minimum of 4 feet above grade and must have a maximum mesh size of 2 inches. Fencing must remain rigid/taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection.

c. Signs warning of the presence of construction hazards and requiring unauthorized persons to keep out of the construction area must be posted on the fencing. At a minimum, signs must be posted every 150 feet. Fenced sides of projects that are less than 150 feet must, at minimum, have at least one warning sign.

d. Depending upon the nature and location of the project site, the Contractor may request not to install temporary fencing in some sections of the project site. The SSHO must submit a risk analysis (AHA) to the Contracting Officer for review. This must be based on a risk analysis of public exposure and other project specific considerations, and must be included in the applicable AHA.

If the Contracting Officer approves the request and has determined fencing is not required, install signs and other acceptable barrier systems, warning of construction hazards, and must be conspicuously posted.

If at any time it is determined the risk to the public changes based on the work, take immediate action to address any risk to the public.

1.4 DOD CONDITION OF READINESS (COR)

DOD will set the Condition of Readiness (COR) based on the weather forecast for sustained winds 50 knots (58 mph) or greater. Contact the Contracting Officer for the current COR setting.

Monitor weather conditions a minimum of twice a day and take appropriate actions according to the approved Emergency Plan in the accepted Accident Prevention Plan, EM 385-1-1 Section 01 Emergency Planning and the

instructions below.

Unless otherwise directed by the Contracting Officer, 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 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 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 weather and COR updates and completion of required actions.

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 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. 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 Activity areas. Contact Contracting Officer for weather and COR updates and completion of required actions. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness.

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.

1.5 CYBERSECURITY DURING CONSTRUCTION

The Contractor must meet the following requirements throughout the construction process.

1.5.1 Contractor Computer Equipment

Contractor owned computers may be used for construction. When used, Contractor computers must meet the following requirements:

1.5.1.1 Operating System

The operating system must be an operating system currently supported by the manufacturer of the operating system. The operating system must be current on security patches and operating system manufacturer required updates.

1.5.1.2 Anti-Malware Software

The computer must run anti-malware software from a reputable software manufacturer. Anti-malware software must be a version currently supported by the software manufacturer, must be current on all patches and updates,

and must use the latest definitions file. All computers used on this project must be scanned using the installed software at least once per day.

1.5.1.3 Passwords and Passphrases

The passwords and passphrases for all computers must be changed from their default values. Passwords must be a minimum of eight characters with a minimum of one uppercase letter, one lowercase letter, one number, and one special character.

1.5.1.4 Contractor Computer Cybersecurity Compliance Statements

Provide a single submittal containing completed Contractor Computer Cybersecurity Compliance Statements for each company using Contractor owned computers. Contractor Computer Cybersecurity Compliance Statements must use the template published at http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/forms-graphics-tables. Each Statement must be signed by a cybersecurity representative for the relevant company.

1.5.2 Temporary IP Networks

Temporary Contractor-installed IP networks may be used during construction. When used, temporary Contractor-installed IP networks must meet the following requirements:

1.5.2.1 Network Boundaries and Connections

The network must not extend outside the project site and must not connect to any IP network other than IP networks provided under this project or Government furnished IP networks provided for this purpose. Any and all network access from outside the project site is prohibited.

1.5.3 Government Access to Network

Government personnel must be allowed to have complete and immediate access to the network at any time in order to verify compliance with this specification.

1.5.4 Temporary Wireless IP Networks

In addition to the other requirements on temporary IP networks, temporary wireless IP (WiFi) networks must not interfere with existing wireless network and must use WPA2 security. Network names (SSID) for wireless networks must be changed from their default values.

1.5.5 Passwords and Passphrases

The passwords and passphrases for all network devices and network access must be changed from their default values. Passwords must be a minimum of 8 characters with a minimum of one uppercase letter, one lowercase letter, one number, and one special character.

1.5.6 Contractor Temporary Network Cybersecurity Compliance Statements

Provide a single submittal containing completed Contractor Temporary Network Cybersecurity Compliance Statements for each company implementing a temporary IP network. Contractor Temporary Network Cybersecurity

Compliance Statements must use the template published at http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/forms-graphics-tables. Each Statement must be signed by a cybersecurity representative for the relevant company. If no temporary IP networks will be used, provide a single copy of the Statement indicating this.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

2.1.1 Bulletin Board

Prior to the commencement of work activities, provide a clear weatherproof 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, Safety and Health Information as required by EM 385-1-1 Section 01, and other information approved by the Contracting Officer. Coordinate requirements herein with 01 35 26.00 22 GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME). Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, and in location as approved by the Contracting Officer.

2.1.2 Project and Safety Signs

Construct sign with a face sheet of 4- by 8-foot exterior grade plywood, 1/2-inch thick, mounted on a substantial frame of treated lumber. Provide one coat of lead-free alkyd primer paint and two coats of an exterior type white enamel to frame and sign. 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. Project sign must be installed at the worksite as directed by the Contracting Officer. Safety signs must be installed at the Contractor office/trailer.

2.1.3 Warning Signs

Post temporary signs, tags, and labels to give workers and the public adequate warning and caution of construction hazards according to the EM 385-1-1 Section 04. Attach signs to the perimeter fencing a maximum of every 150 feet warning the public of the presence of construction hazards. Signs must require unauthorized persons to keep out of the construction site. Correct the data required by safety signs daily. Post signs at all points of entry designating the construction site as a hard hat area.

2.2 TEMPORARY TRAFFIC CONTROL

2.2.1 Haul Roads

At no expense to the Government, construct access and haul roads necessary for proper prosecution of the work under this Contract in accordance with EM 385-1-1 Section 04. Construct with suitable grades and widths; avoid sharp curves, blind corners, and dangerous cross traffic. Submit haul road plan for approval. 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 haul 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. Barricades are required 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. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.3 FENCING

Provide fencing along the construction site and at all open excavations and tunnels to control access by unauthorized people. Safety fencing must be highly visible to be seen by pedestrians and vehicular traffic. All fencing must meet the requirements of EM 385-1-1. Remove the fence upon completion and acceptance of the work. Fencing must be installed to be able to restrain a force of at least 250 pounds against it.

2.3.1 Polyethylene Mesh Safety Fencing

Temporary safety fencing must be a high visibility orange colored, high density polyethylene grid, a minimum of 48 inches high and maximum mesh size of 2 inches. Fencing must extend from the grade to a minimum of 48 inches above the grade and be tightly secured to T-posts spaced as necessary to maintain a rigid and taut fence. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection.

2.4 TEMPORARY WIRING

Provide temporary wiring in accordance with EM 385-1-1 Section 11, NFPA 241, and NFPA 70. Include monthly inspection and testing of all equipment and apparatus.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Construction Contract employees must park privately owned vehicles in an area designated by the Contracting Officer. Employee parking must not interfere with existing and established parking requirements of the Government installation. Refer to Section 01 14 00.00 20 WORK RESTRICTIONS (PWD ME) (AOR) paragraph EMPLOYEE PARKING for additional requirements.

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 Government Provided Utility Services

a. The Government will make all reasonably required utilities available

from existing outlets and supplies, as specified in the Contract. Reasonable amounts of the following utilities will be made available without charge. Carefully conserve utilities furnished without charge.

Electricity (at the manholes and tunnels)

b. The point at which the Government will deliver such utilities and the quantity available must be coordinated with the Contracting Officer. Pay all costs incurred in connecting, converting, and transferring the utilities to the work. Make connections, including providing transformers; and make disconnections.

Notes:
1. Limited electricity is available at the manholes and tunnels. The Activity is capable of providing adequate power for construction activities except as noted in Note 3 below.
2. Limited water is not available to be provided by the Government for this project. The Contractor must provide water from an approved off-site location.
3. Provide generators for use in supplying temporary electric power for welding operations.

3.2.3 Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities approved in accordance with EM 385-1-1 Section 02 and by the Contracting Officer. Locate the facilities behind the construction fence or out of the public view. Clean units and empty wastes at least once a week or more frequently into a municipal, district, or Activity sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into a municipal, district, or commercial sanitary sewer system. Penalties or fines associated with improper discharge will be the responsibility of the Contractor. 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.

3.2.4 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.2.5 Obstruction Lighting of Cranes

Provide a minimum of two (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.

3.2.6 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 to the Contracting Officer a Traffic Control Plan for Government approval 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 all permits required for modification to traffic movements outside Activity's jurisdiction. Oversized and slow-moving vehicles may be moved to the worksite provided requirements of the State of Maine Department of Transportation 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 vehicle or pedestrian traffic.

c. Provide, erect, and maintain, at no expense to the Government, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage and overhead protection authority having jurisdiction.

d. 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.

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 and 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. Provide self-illuminated (lighted) barricades during hours of darkness. Brightly-colored (orange) vests are required for all personnel working in roadways. 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. The Contractor is responsible for the repair of 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. Coordinate dust control methods with Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS (AOR).

3.4 CONTRACTOR'S TEMPORARY FACILITIES

Contractor is responsible for security of their property. Provide adequate outside security lighting at the temporary facilities. Trailers must be anchored to resist high winds and meet applicable State or local standards for anchoring mobile trailers. Coordinate anchoring with EM 385-1-1 Section 04. The Contract Clause entitled "FAR 52.236-10, Operations and Storage Areas" and the following apply:

3.4.1 Safety Systems

Protect the integrity of any installed safety systems or personnel safety devices. Obtain prior approval from the Contracting Officer if entrance into systems serving safety devices is required. 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 Contractor personnel. Field offices must be located in the vicinity of B100 Transmitter Building at a location to be approved by the Contracting Officer. This location will need to be coordinated with the work of this and other Contracts and Contractor Field Offices may need to be located at another location rather than directly adjacent to the building(s).

3.4.3 Storage Area

Construct a temporary 6 foot high chain link fence around trailers and materials. Include plastic strip inserts, colored green, 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 boundaries of the Activity. 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 the current 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 request, and pending availability, the Contracting Officer will designate another or supplemental area for the 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 Activity boundaries. Maintain the area in a clean and orderly fashion and secured if needed to protect supplies and equipment. Utilities will not be provided to this area by the Government.

3.4.5 Maintenance of Storage Area(s)

Keep fencing in a state of good repair and proper alignment. Grassed or unpaved areas, which are not established roadways, must 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 must be edged or trimmed neatly.

3.4.6 Appearance of Trailers

a. Trailers must be roadworthy and comply with all appropriate State and local vehicle requirements. Trailers which are rusted, have peeling paint or are otherwise in need of repair will not be allowed on Activity property. Trailers must present a clean and neat exterior appearance and be in a state of good repair.

b. Maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal at the Contractor's expense.

3.4.7 Trailers or Storage Buildings

a. Trailers or storage buildings will be permitted, where space is available, subject to the approval of the Contracting Officer.

b. Mount a sign not smaller than 24 by 24 inches on the trailer or building that shows the company name, business phone number, emergency phone number and conforms to the following requirements and sketch located at the end of this Section:

Graphic panel	Aluminum, painted blue
Copy	Screen painted or vinyl die-cut, white
Typeface	Univers 65 u/lc
See Sketch No. 01500 (graphic).	

3.4.8 Special Storage Requirements

The following special storage requirements apply:

3.4.8.1 Storage Size and Location

The open site available for storage must be as indicated and as directed by the Contracting Officer. The storage area will be approximately 20,000 square feet.

3.4.8.2 Storage in Existing Buildings

The Contractor will be working in and around existing buildings; the storage of material will not be allowed in the buildings. Provide 8 foot high-security fence with a lockable gate around the storage area. Remove at the completion of work.

3.4.9 Laydown Space

Parking and laydown space on the site is limited to the area shown on the plans. Manage the on-site work including equipment, storage trailers, material, material deliveries to allow the work to be completed within the specified Contract duration. This may require the Contractor to locate suitable storage off-site and multiple equipment mobilizations to allow the work to be completed. Equipment or materials not used to complete the work must be removed from the site. If additional offsite storage, additional mobilization or demobilizations are required, all these costs must be included in the base bid.

Failure to plan the work based on the space limitations must not be the basis for any claim nor an equitable price or Contract time adjustment.

3.4.10 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the temporary facilities 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 temporary facilities from damage.

3.4.11 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. Job trailers must be anchored into the ground and have continuous skirting around trailers. Anchor trailers per the trailer manufacturer's recommendations.

3.4.12 Temporary Partitions

Provide "No Dust" temporary partitions of wood or metal frame, heavy duty plastic sheathing and negative pressure HEPA filtered ventilation. Provide access door and vestibules as required to prevent dust from escaping the enclosure.

3.5 PLANT COMMUNICATION

Whenever there are individual elements of the plant located so that operation by normal voice between these elements is not satisfactory, install a satisfactory means of communication, such as telephone or other suitable devices and made available for use by Government personnel.

3.6 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 as specified in paragraph entitled CONSTRUCTION SITE PLAN herein. Maintain the safety fencing during the life of the Contract and, upon completion and acceptance of the work, remove from the work site.

3.7 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 all 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.

3.8 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, fencing, haul roads, and any other temporary products from the site. After removal of trailers, temporary utilities, materials, and equipment from within the fenced area, remove the fence. Restore areas used during the performance of the Contract to the original or better condition. Remove gravel, wood timbers, steel plates, or polyethylene sheeting used to traverse grassed areas and restore the areas to their original condition, including top soil and seeding as necessary.

-- End of Section --

SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS (AOR)
02/19

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. Note: This is not an all inclusive list of publications and other references may be applicable.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 833-R-060-04	(2000) Developing Your Storm Water Pollution Prevention Plan, a Guide for Construction Sites

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

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 122.26	Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25)
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 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 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 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 271	Requirements for Authorization of State Hazardous Waste Programs
40 CFR 272	Approved State Hazardous Waste Management Programs
40 CFR 273	Standards For Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification
40 CFR 372-SUBPART D	Specific Toxic Chemical Listings
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
40 CFR 82	Protection of Stratospheric Ozone
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 178	Specifications for Packagings

STATE OF MAINE REGULATIONS

The following STATE OF MAINE REGULATIONS are available on the Internet at: http://www.maine.gov/dep/permits.htm

STATE OF MAINE Statutes are available on the internet at http://www.mainelegislature.org/legis/statues/38/title38ch3sec0.html

MAINE DEP AIR BUREAU CHAPTER 101 Visible Emissions Regulations; http://www.maine.gov/dep/air/rules/index.html

MAINE DEP AIR BUREAU CHAPTER 151 Architectural and Industrial Maintenance(AIM) COATINGS; http://www.maine.gov/dep/air/rules/index.html

MAINE DEP 38 MSRA 420-C	Erosion and Sedimentation Control Law and Rules
MAINE DEP 38 MSRA 420-D	Stormwater Management
MAINE 38 MRSA 439-B	Contractors Certified in Erosion Control (Latest Edition)
MAINE DEP MSRA 481-490	Site Location of Development
MAINE 38 MSRA 850	Identification of Hazardous Waste
MAINE 38 MSRA 851	Standards for Generators of Hazardous Waste
MAINE 38 MSRA 852	Land Disposal Restrictions
MAINE DEPLW0738	Stormwater Management for Maine
MAINE DEPLW0588	Maine Erosion and Sediment Control Best Management Practices
MAINE 88 MRSA 480A-480Z	Natural Resources Protection Act

MAINE DEP AIR BUREAU CHAPTER 159 Control of Volatile Organic Compounds from Adhesives and Sealants; http://www.maine.gov/dep/air/rules/index.html

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material, including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations. Types of solid waste typically generated at construction sites may include:

a. Green waste: 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.

b. Surplus soil: 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.

c. Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal

matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may not 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.

d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.

e. Scrap metal: 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.

f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can. NOTE: Aerosol (paint) cans are Hazardous Wastes and must not be disposed of as solid waste or be considered in any definition of "empty", "paint", or "metal" cans.

g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may be included as recyclable if sold to a scrap metal company. Paint cans may be included as recyclable if sold to a scrap metal company.

h. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this Document.

   Material not regulated as solid waste are: 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.

i. Special Waste: "Special waste" means any solid waste generated by sources other than household and typical commercial establishments that exists in such an unusual quantity or in such a chemical or physical state, or any combination thereof, that may disrupt or impair effective waste management or threaten the public health, human safety or the environment and requires special handling, transportation and disposal procedures. Special waste includes, but is not limited to:

   (1) Ash;

   (2) Industrial and industrial process waste;

   (3) Sludge and dewatered septage;

   (4) Debris from nonhazardous chemical spills and cleanup of those spills;

(5) Contaminated soils and dredge materials;

(6) Asbestos and asbestos-containing waste;

(7) Sand blast grit and non-liquid paint waste;

(8) High and low pH waste;

(9) Spent filter media residue;

(10) Shredder residue; and

(11) Railroad ties with or without creosote.

1.2.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

1.2.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

1.2.5 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.6 Hazardous Waste

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273, 40 CFR 279, and 40 CFR 280.

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:

a. Is regulated as a hazardous material per 49 CFR 173, or

b. Requires a Safety Data Sheet (SDS) per 29 CFR 1910.120, or

c. 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 instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence

over this instruction for "control" purposes. Such material include 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). Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

1.2.8 Waste Hazardous Material (WHM)

Any waste material which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

1.2.9 Oil or Oily Waste

Oil: Oil of any kind or in any form, including, but not limited to: fats, oils, or greases of animals, fish or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum fuel oil, sludge, synthetic oils, mineral oils, oil refuse or oil mixed with wastes other than dredged oil.

Oily Waste: Those materials which are, or were, mixed with used oil and have become separated from that used oil. 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, used oil 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:

a. It is not prohibited in other State regulations or local ordinances;

b. The amount generated is "de minimus" (a small amount);

c. It is the result of minor leaks or spills resulting from normal process operations; and

d. All free-flowing oil has been removed to the practical 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, a hazardous waste determination must be performed 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.

1.2.10 Regulated Waste

Those solid waste that have specific additional Federal, State, or local controls for handling, storage, or disposal.

1.2.11 Class I Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act and includes the following chemicals:

chlorofluorocarbon-11 (CFC-11)
chlorofluorocarbon-12 (CFC-12)
chlorofluorocarbon-13 (CFC-13)
chlorofluorocarbon-111 (CFC-111)
chlorofluorocarbon-112 (CFC-112)
chlorofluorocarbon-113 (CFC-113)
chlorofluorocarbon-114 (CFC-114)
chlorofluorocarbon-115 (CFC-115)
chlorofluorocarbon-211 (CFC-211)
chlorofluorocarbon-212 (CFC-212)
chlorofluorocarbon-213 (CFC-213)
chlorofluorocarbon-214 (CFC-214)
chlorofluorocarbon-215 (CFC-215)
chlorofluorocarbon-216 (CFC-216)
chlorofluorocarbon-217 (CFC-217)
chlorofluorocarbon-500 (CFC-500)
chlorofluorocarbon-502 (CFC-502)
chlorofluorocarbon-503 (CFC-503)
halon-1211
halon-1301
halon-2402
carbon tetrachloride
methyl bromide
methyl chloroform

Class II ODS is defined in Section 602(s) of The Clean Air Act and

includes the following chemicals:

hydrochlorofluorocarbon-21 (HCFC-21)
hydrochlorofluorocarbon-22 (HCFC-22)
hydrochlorofluorocarbon-31 (HCFC-31)
hydrochlorofluorocarbon-121 (HCFC-121)
hydrochlorofluorocarbon-122 (HCFC-122)
hydrochlorofluorocarbon-123 (HCFC-123)
hydrochlorofluorocarbon-124 (HCFC-124)
hydrochlorofluorocarbon-131 (HCFC-131)
hydrochlorofluorocarbon-132 (HCFC-132)
hydrochlorofluorocarbon-133 (HCFC-133)
hydrochlorofluorocarbon-141 (HCFC-141)
hydrochlorofluorocarbon-142 (HCFC-142)
hydrochlorofluorocarbon-221 (HCFC-221)
hydrochlorofluorocarbon-222 (HCFC-222)
hydrochlorofluorocarbon-223 (HCFC-223)
hydrochlorofluorocarbon-224 (HCFC-224)
hydrochlorofluorocarbon-225 (HCFC-225)
hydrochlorofluorocarbon-226 (HCFC-226)
hydrochlorofluorocarbon-231 (HCFC-231)
hydrochlorofluorocarbon-232 (HCFC-232)
hydrochlorofluorocarbon-233 (HCFC-233)
hydrochlorofluorocarbon-234 (HCFC-234)
hydrochlorofluorocarbon-235 (HCFC-235)
hydrochlorofluorocarbon-251 (HCFC-251)
hydrochlorofluorocarbon-252 (HCFC-252)

hydrochlorofluorocarbon-253 (HCFC-253)
hydrochlorofluorocarbon-261 (HCFC-261)
hydrochlorofluorocarbon-262 (HCFC-262)
hydrochlorofluorocarbon-271 (HCFC-271)

1.2.11.1 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (e.g., thermostats) and lamps (e.g., 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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Survey; G

Solid Waste Management Plan and Permit; G

Regulatory Notifications; G

Environmental Management Plan (EMP); G

Storm Water Pollution Prevention Plan; G

Storm Water Management/Erosion And Sedimentation Control Plan; G

Storm Water Notice of Intent (for NPDES coverage under the general permit for construction activities); G

Dirt and Dust Control Plan; G

Contractor Hazardous Material Inventory Log; G

Dewatering Plans; G

Spill Prevention, Control, and Countermeasures (SPCC) Plan; G

SD-06 Test Reports

Laboratory Analysis; G

Disposal Requirements; G

Erosion and Sediment Control Inspection Reports; G

Storm Water Inspection Reports for General Permit; G

Contractor 40 CFR employee training records; G

Solid Waste Management Report; G

SD-11 Closeout Submittals

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the binder corresponding to each of the applicable sub items listed below.

Storm Water Pollution Prevention Plan compliance notebook; G

Waste Determination Documentation; G

Disposal Documentation for Hazardous and Regulated Waste; G

Contractor 40 CFR 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

Asbestos Free Certification Form; G

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the Contract, environmental protection as defined herein. Plan for and provide environmental protective measures to control pollution that develops during normal 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. 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. Comply with 29 CFR 1910.

The Contractor may be required to promptly conduct tests and procedures for the purpose of assessing whether construction operations are in compliance with Applicable Environmental Laws. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.4.1 Environmental Compliance Assessment Training and Tracking System (ECATTS)

The QC Manager is responsible for environmental compliance on projects unless an Environmental Manager is named. The QC Manager (and alternative QC Manager) or Environmental Manager must complete ECATTS training 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 ECATTS training within 14 days of assignment to the project.

Submit an ECATTS certificate of completion for personnel who have completed the required "Environmental Compliance Assessment Training and Tracking System (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/start. Obtain the password for registration from the Contracting Officer.

This training has been structured to allow Contractor personnel to receive credit under this Contract and also to carry forward credit to future Contracts. Contractors must ensure that the QC Manager (and alternate QC Manager) or 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 re-take modules tailored to the state where the Contract work is being performed.

ECATTS is available for use by all Contractor and subcontractor personnel associated with this project. These other personnel are encouraged (but not required) to take the training and may do so at their discretion.

1.4.2 Conformance with the Environmental Management System

The Contractor must perform work under this Contract consistent with the policy and objectives identified in the Installation's Environmental Management System (EMS). The Contractor must perform work in a manner that conforms to objectives and targets, environmental programs and operational controls identified by the EMS. The Contractor must 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, the Contractor must take corrective and/or preventative actions. In addition, the Contractor must ensure that its employees are aware of their roles and responsibilities under the EMS and how these EMS roles and responsibilities affect work performed under the Contract.

The Contractor is responsible for ensuring that their employees receive applicable environmental and occupational health and safety training, and keep up to date on regulatory required specific training for the type of work to be conducted onsite. All on-site Contractor personnel, and their subcontractor personnel, performing tasks that have the potential to cause a significant environmental impact must be competent on the basis of appropriate education, training or experience. Upon Contract Award, the Contracting Officer's Representative will notify the Installation's EMS Coordinator to arrange EMS training. The installation's EMS Coordinator must identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. The Contractor must provide training documentation to the Contracting Officer. The EMS Coordinator must retain associated records.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey

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.

1.5.2 Regulatory Notifications

All communications with regulatory agencies are conducted by the Navy Environmental Office. Any Contractor communications with a regulatory agency must be coordinated with the Navy prior to conducting those communications. Any regulatory submittals must first be coordinated with the Navy and will be submitted by the Navy. The Contractor must submit copies of all regulatory notifications to the Contracting Officer 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, remediation of controlled substances (asbestos, hazardous waste, lead paint, PCBs).

1.5.3 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 Activity; 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 Activity Environmental Staff to discuss the proposed Environmental Management Plan. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, required permits, permit requirements, and other measures to be taken.

1.5.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager must be directly responsible for coordinating Contractor compliance with Federal, State, local, and Activity requirements. The Environmental Manager must ensure compliance with erosion control measures and Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the Environmental Management Plan; ensure that all environmental permits are obtained, maintained, and closed out; ensure compliance with Storm Water Program Management 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 all 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.

1.5.5 Contractor 40 CFR Employee Training Records

Prepare and maintain employee training records throughout the term of the Contract meeting applicable 40 CFR requirements. The Contractor must 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. The Contractor must 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 training records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Prior to initiating any work on site, the Contractor must meet with the Contracting Officer and the Activity's Environmental Staff to discuss the proposed Environmental Management Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. The Contractor's Environmental Management System and Federal, State, and local requirements must incorporate construction related objectives and targets from the installation's Environmental Management System. The Environmental Management Plan must be submitted in the following format and must include the elements specified below.

a. Description of the Environmental Management Plan

(1) General overview and purpose

(a) A brief description of each specific plan required by environmental permit or elsewhere in this Contract.

(b) The duties and level of authority assigned to the person(s) on the job site that oversee environmental compliance.

(c) 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.

(d) Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

(e) Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

(2) General site information including a site plan showing haul routes, stockpile and material laydown and storage areas, dust

control, construction trailers locations, sanitary facilities, and all other construction facilities required for the work.

(3) A letter signed by an officer of the firm appointing the Environmental Manager and stating that he/she 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.

b. Management of Natural Resources

(1) Land resources

(2) Tree protection

(3) Replacement of damaged landscape features

(4) Temporary construction

(5) Stream crossings

(6) Fish and wildlife resources

(7) Wetland areas

c. Protection of Historical and Archaeological Resources

(1) Objectives

(2) Methods

d. Storm Water Management and Control

(1) Ground cover

(2) Erodible soils

(3) Temporary measures

(a) Mechanical retardation and control of runoff

(b) Vegetation and mulch

(4) Effective selection, implementation and maintenance of Best Management Practices (BMPs).

(5) Wastewater disposal methods.

e. Protection of the Environment from Waste Derived from Contractor Operations

(1) Containment, collection, control and disposal of materials and debris from coating removal and application operations.

(2) Control and disposal of solid and sanitary waste. If Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL is included in Contract, submit the plan required by that section as part of the Environmental Management Plan.

(3) Control and disposal of hazardous waste (Hazardous Waste Management Section)

This item will consist of the management procedures for all hazardous waste to be generated. The elements of those procedures will coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Contracting Officer. As a minimum, include the following:

(a) Procedures to be employed to ensure a written waste determination is made for appropriate wastes which are to be generated;

(b) Sampling/analysis plan;

(c) Methods of hazardous waste accumulation/storage (i.e., in tanks and/or containers);

(d) Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted);

(e) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268);

(f) Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and the like;

(g) Used oil management procedures in accordance with 40 CFR 279;

(h) Pollution prevention/hazardous waste minimization procedures;

(i) Plans for the disposal of hazardous waste by permitted facilities; and

(j) Procedures to be employed to ensure all required employee training records are maintained.

f. Prevention of Releases to the Environment

(1) At a minimum, procedures to prevent releases to the environment will be made available, as well as what notifications to make in the event of a release to the environment.

(2) A Spill Prevention, Control, and Countermeasures (SPCC) Plan is required if work is anticipated to extend beyond 6 months, AND will use bulk oil storage containers 55 gallons or greater, in accordance with 40 CFR 112. All SPCC plans must be approved by the Activity Environmental Department and/or the Contracting Officer. Plans need not be certified by a Professional Engineer but must clearly demonstrate proper management of all tanks and containers on site.

(3) Spill plans should at a minimum include the following:

a) Type of tank or container, quantity stored, type of product

stored, location.

b) Secondary containment required for tanks/containers 55 gallons or greater; double-wall tanks preferred.

c) Tank inspection forms (industry standard). Records must be kept for 3 years or for the duration of the project. Tanks must be inspected monthly.

i) Bulk storage containers (55 gallons or greater require monthly inspection).

ii) Inspection sheet for release of retained storm water from secondary containment.

d) Where spill kits are located.

e) If transferring fuel: how often, what type of fuel, and where? The Contractor must coordinate with Contracting Officer and Activity Environmental Department prior to transferring any fuel.

f) Who to notify in case of a spill (Central Dispatch, Activity Environmental Department, NRC, MEDEP as needed).

g) How to clean up a spill safely and how to properly dispose of spill cleanup waste.

g. Regulatory Notification and Permits

List what notifications and permit applications must be made. Demonstrate that those permits have been obtained by including copies of all applicable, environmental permits.

h. Dewatering Work Plan

Include in the EMP a Dewatering Work Plan. The work plan must be prepared in accordance with requirements specified in the Excavation and Filling Specification.

3.1.1 Environmental Management Plan Review

Within thirty days after the Contract Award date, submit the proposed Environmental Management Plan for further discussion, review, and approval. Commencement of work will not be allowed to begin until the environmental management plan has been approved.

3.1.2 Licenses, State and Federal Permits

The approved State and Federal permits for this project may include the following:

1. Costal Zone Management Act
2. MDEP Stormwater Permit by Rule
3. Natural Resource Protection Act Permit by Rule (NRPA)
4. Army Corp of Engineers (ACOE)
5. NPEDS Stormwater Notice of Intent

For permits obtained by the Contracting Officer, whether or not required by the permit, the Contractor is responsible for conforming to all permit

requirements and performing all quality control inspections of the work in progress, and to submit notifications and certifications to the applicable regulatory agency via the Contracting Officer.

Where required by the State regulatory authority, the inspections and certifications must be provided through the services of a Professional Engineer (PE), registered in the State of Maine. Where a PE is not required, the individual must be otherwise qualified by other current State licensure, specific training and prior experience (minimum 5 years). As a part of the quality control plan, which is required to be submitted for approval by Section 01 45 00.00 22 QUALITY CONTROL (PWD ME), provide a sub item containing the name, appropriate professional registration or licence number, address, and telephone number of the professionals or other qualified persons who will be performing the inspections and certifications for each permit.

3.2 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work and as specified in the permits issued for the work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified. If the work is near streams, lakes, or other waterways, conform to the national permitting requirements of the Clean Water Act.

Do not disturb fish and wildlife. 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 indicated or specified.

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 will be responsible for any resultant damage.

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Contracting Officer's approval before replacement. Tree wound paint must not be used for tree cuts or stumps.

The Contracting Officer's approval is 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.

3.2.1 Erosion and Sediment Control Measures

a. The State of Maine Erosion and Sediment Control Law requires persons undertaking activity involving filling, displacing or exposing soil or other earthen materials to take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a

protected natural resource.

Erosion control measures must be in place before the activity begins, maintained and must remain in place and functional until the site is permanently stabilized.

Temporary and permanent erosion control measures must meet, at a minimum, the construction standards presented in the Maine Erosion and Sediment Control Best Management Practices Manual, latest edition. Other techniques may be employed if the Contractor demonstrates to the Contracting Officer that the practice will achieve the required result of no release of sediment per State law.

b. Site work including any filling, excavation, landscaping, and/or other earthwork in excess of one cubic yard of disturbance, must comply with State of Maine requirements for certification in erosion and sediment control practices within a shoreland zone. A certified individual must be responsible for management of erosion and sediment control practices at the site each day earth moving activities occur. A certified individual is required to visit the site every day to ensure proper erosion and sediment control practices are followed. As an alternative, the Contractor may choose to Contract with a certified individual to supervise the Contractor's work in shoreland areas.

c. Storm Water Management/Erosion and Sedimentation Control Plan

(1) The Contractor must submit a Storm Water Management/Erosion and Sedimentation Control Plan to the Contracting Officer, for review and approval. The Plan must demonstrate effective selection, implementation and maintenance of Best Management Practices (BMPs) demonstrating compliance with the Activity's Maine Pollutant Discharge Elimination System's Multi-Sector General Permit for Stormwater Discharge Associated With Industrial Activity (MSGP) and the State of Maine Erosion and Sediment Control Law for projects in Maine.

The Contractor must describe and ensure compliance with terms of state general permit for storm water discharge and terms and conditions specified in the approved permits issued for the work.

Provide plan details of chosen temporary erosion and sediment controls to be employed specific to the work site. Provide site plan showing locations for controls. Ensure proposed controls comply with MEDEP approved plans and State regulations.

Submit Dewatering Plans.

Submit Storm Water Pollution Prevention Plan Compliance Notebook at project completion or as directed by the Contracting Officer.

The Plan must:

(a) Identify potential sources of pollution which may be reasonably expected to affect the quality of storm water discharge from the site.

(b) Describe and ensure implementation of practices which will be used to reduce the pollutants in storm water discharge at the manufacturing, storage and lay down, and construction sites.

(c) Describe and ensure full compliance with State of Maine General Permit - Construction Activity (No. DEPLW0801 latest edition) and permits issued by the MEDEP specific to the project.

(d) Describe and ensure compliance with MEDEP over winter stabilization and construction requirements.

(e) Identify inspections and maintenance schedules for Best Management Practices demonstrating compliance with Maine standards. Maintenance procedures must address regular cleaning of drainage structures and repair of temporary erosion control structures, as well as a final cleaning of all drainage structures and removal and reclamation of temporary erosion and sediment control BMP's upon completion of the project.

(f) Select applicable management practices from Maine Erosion and Sediment Control BMPs. Present construction details for all proposed erosion and sediment controls.

(g) Include documentation that the individual responsible for management of erosion and sediment control practices at the site is certified in accordance with the State of Maine DEP regulations.

(h) Control of Manufactured Concrete Product Waste Plan

(i) **Stockpiles**: Soil stockpiles must be covered with an erosion control cover and a sediment barrier must be installed along the downgradient edge to collect runoff and sediments. Polyethylene sheeting with a minimum thickness of 6 mil is acceptable for cover.

3.2.1.1 Dust Control

Dust control must meet the requirements of MEDEP Erosion and Sediment Control BMPs. 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 or sweeping. 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. Runoff from cutting water is prohibited from entering storm drains or leaving the work site. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

When temporary dust control measures are employed, repetitive treatment must be applied as needed to accomplish control.

Visible emissions from a fugitive emission source (including stockpiles and roadways) must not exceed an opacity of 20 percent, except for no more than five (5) minutes in any 1-hour period.

Dust suppression during demolition work may include using a manned water hose. Runoff from the site is prohibited.

3.2.1.2 Burnoff

Burnoff of the ground cover is not permitted.

3.2.1.3 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.2.1.4 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

a. Mechanical Retardation and Control of Runoff

Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, berms, and use of silt fences and straw bales to retard and divert runoff to protected drainage courses.

b. Sediment Basins

(1) Trap sediment in temporary sediment basins. Select a basin size to accommodate the runoff of a local 10-year storm. Pump dry and remove the accumulated sediment, after each storm. Use a paved weir or vertical overflow pipe for overflow. Remove collected sediment from the site. Institute effluent quality monitoring programs.

(2) Install, inspect, and maintain best management practices (BMPs) as required by the general permit. Prepare BMP Inspection Reports as required by the general permit. If required by the permit, include those inspection reports.

c. Vegetation and Mulch

(1) Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

(2) Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish or reestablish a suitable stand of grass.

3.2.2 Erosion and Sediment Control Inspection Reports

Submit "Erosion and Sediment Control Inspection Reports" (E&S) (form provided at the pre-construction conference) and Storm Water Inspection Reports for General Permit for General Permit to the Contracting Officer once every 7 calendar days and within 24 hours of a storm event that produces 0.5 inch or more of rain.

Note erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports if applicable.

3.2.2.1 Erosion and Sediment Control Inspection Reports

Inspection reports must be kept on file at the project site and submitted electronically to the Contracting Officer upon request. The State of Maine requires inspections of disturbed and impervious areas, erosion and sediment control measures, areas used for storage that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspections must be performed at least once per week as well as BEFORE and AFTER a storm event. A storm event is any precipitation event with the potential to create runoff but at a minimum should be every storm greater than 0.5 inches of precipitation. Inspection reports must document compliance with State requirements.

3.2.2.2 Storm Water Notice of Intent for Construction Activities and Storm Water Pollution Prevention Plan

The Contractor must submit a Storm Water Notice of Intent (for NPDES coverage under the general permit for construction activities) and a Storm Water Pollution Prevention Plan (SWPPP) for the project to the Contracting Officer prior and gain approval prior to the commencement of work. The SWPPP will meet the requirements of the EPA or State general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intents, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate Federal or State agency for approval, a minimum of 45 calendar days prior to the start of any land disturbing activities. The Contractor must maintain an approved copy of the SWPPP at the construction on-site office, and continually update as regulations require, reflecting current site conditions.

Coverage under this permit requires the Contractor to prepare a Storm Water Pollution Prevention Plan (SWPPP), prepare and submit a Registration Statement as a co-permittee with the Contracting Officer, and provide the permit fee to the responsible state agency before any land disturbing activities begin. The Contractor must file for permit coverage on behalf of the Contracting Officer and himself/herself and file a Notice of Termination once construction is complete and the site is stabilized with a final sustainable cover.

Under the terms and conditions of the permit, the Contractor may be required to install, inspect, maintain best management practices (BMPs), and submit stormwater BMP inspection reports and stormwater pollution prevention plan inspection reports. The Contractor must ensure construction operations and management are constantly in compliance with the terms and conditions of the general permit for storm water discharges from construction activities.

a. The SWPPP must:

(1) Identify potential sources of pollution which may be reasonably expected to affect the quality of storm water discharge from the site.

(2) Describe and ensure implementation of practices which will be used to reduce the pollutants in storm water discharge from the site.

(3) Ensure compliance with terms of the EPA or State general permit for storm water discharge.

(4) Select applicable best management practices from EPA 833-R-060-04.

(5) Include a completed copy of the Registration Statement, BMP Inspection Report Template and Notice of Termination except for the effective date.

(6) Storm Water Pollution Prevention Measures and Notice of Intent 40 CFR 122.26, EPA 833-R-060-04. Provide a "Storm Water Pollution Prevention Plan" (SWPPP) for the project. The SWPPP must meet the requirements of the EPA or State general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intents, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate Federal or State agency for approval, a minimum of 14 calendar days prior to the start of construction. A copy of the approved SWPPP must be kept at the construction on-site office, and continually updated as regulations require reflecting current site conditions.

3.2.2.3 Storm Water Pollution Prevention Plan Compliance Notebook

The Contractor must create and maintain a three binder of documents that demonstrate compliance with the Stormwater Construction Activity permit. The binder must include a copy of the permit Registration Statement, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports, copies of correspondence with the Maine DEP and a copy of the permit Notice of Termination. At the completion of the project the folder must become the property of the Government. The compliance notebook must be provided to Contracting Officer. An advance copy of the Registration Statement must be provided to the Contracting Officer immediately after the form is presented to the permitting agency.

3.2.3 Stormwater Drainage and Construction Dewatering

There must be no discharge of excavation ground water to the sanitary sewer, storm drains, streams, or to the ocean without prior specific authorization of the Activity Environmental Division in writing. Discharge of hazardous substances must not be permitted under any circumstances.

Construction site runoff must be prevented from entering any storm drains, streams, or the ocean directly by the use of straw bales or other method suitable to the Activity Environmental Division. Contractor must provide erosion protection of the surrounding soils.

Construction Dewatering must not be discharged to the sanitary sewer, storm drains, streams or the ocean. 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. Authorization for any contaminated groundwater release must be obtained in advance from the Activity Environmental Officer. Discharge of hazardous substances will not be permitted under any circumstances.

3.3 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Carefully protect in-place and report immediately to the Contracting Officer historical and archaeological items or human skeletal remains discovered in the course of work. Upon discovery, notify the Contracting Officer. Stop work in the immediate area of the discovery until directed

by the Contracting Officer to resume work. The Government retains ownership and control over historical and archaeological resources.

If historical, archaeological items, or human remains are discovered during excavations for the project, a certified Maine Archeologist must be on site to monitor excavation work. The qualifications of the Archeologist must be submitted and approved by the Contracting Officer. A site monitoring report prepared by the Archeologist must be submitted to the Contracting Officer within 21 calendar days of completing site excavation work.

3.4 SOLID WASTE MANAGEMENT PLAN and PERMIT

Provide to the Contracting Officer written notification of the quantity of solid waste/debris that is anticipated 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 or as applicable, submit one copy of a State and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

If waste from the site is taken to a transfer station, identify the facility or facilities at which the waste is ultimately disposed. Government approval for the facility must be obtained prior to transporting wastes off Government property.

Provide to the Contracting Officer written notification of the quantity of solid waste/debris that is anticipated 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 or as applicable, submit one copy of a State license showing such agency's approval of the disposal plan before transporting wastes off Government property.

3.4.1 Solid Waste Management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report must state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

The Contractor must include copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, the Contractor may submit a statement indicating the disposal location for the solid waste which is signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification 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 by the Contractor for his/her own use, the Contractor must submit on the solid waste disposal report the information previously described in this paragraph. Prices paid or received must not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.4.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers which 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. Recycling is encouraged and required and must be coordinated with the Contracting Officer and the Activity's Recycling Coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, State, and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage spent hazardous material used in construction, including, but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, as per environmental law.

3.4.2.1 Dumpsters and Rolloffs

Equip dumpsters and rolloffs with a secure lid or cover and ensure dumpsters and rolloffs are watertight. Keep lid or cover closed at all times, except when being loaded with trash and debris. Locate dumpsters and rolloffs behind the construction fence or out of the public view and away from storm drains. Empty site dumpsters at least once a week or as needed to keep the site free of debris and trash. If necessary, provide 55 gallon trash containers to collect debris in the construction site area. Locate the trash containers behind the construction fence or out of the public view. Empty trash containers at least once a day. For large demolitions, rolloffs must use a cover and be watertight. Debris must not be higher than the sides before emptying. Discharges from dumpsters and rolloffs are prohibited.

3.5 WASTE DETERMINATION DOCUMENTATION

Complete a Waste Determination form (provided at the pre-construction conference) for all Contractor derived wastes to be generated. Base the waste determination upon either a constituent listing from the manufacturer used in conjunction with consideration of the process by which the waste was generated, EPA approved analytical data, or laboratory analysis Safety Data Sheets (SDS) by themselves are not adequate). Attach all support documentation to the Waste Determination form. As a minimum, a Waste Determination form must be provided for the following wastes (this listing is not all inclusive): oil and latex based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and all containers of the original materials.

3.6 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 Safety Data Sheets (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. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

3.6.1 Disposal Documentation for Hazardous and Regulated Waste

Manifest, pack, ship and dispose of hazardous or toxic waste and universal waste that is generated as a result of construction in accordance with the generating facilities generator status under the Recourse Conservation and Recovery Act. 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 manifest must be reviewed, signed, and approved by the Navy before the Contractor may ship waste. To obtain specific disposal instructions the Contractor must coordinate with the Activity Environmental Office.

3.7 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of hazardous waste. Include procedures for pollution prevention/hazardous waste minimization in the Hazardous Waste Management Section of the Environmental Management Plan. Consult with the Activity Environmental Office for suggestions and to obtain a copy of the installation's pollution prevention/hazardous waste minimization plan for reference material when preparing this part of the plan. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the types of hazardous materials expected to be used in the construction when requesting information.

3.8 WHM/HW MATERIALS PROHIBITION

No waste hazardous material or hazardous waste must be disposed of on Government property. No hazardous material must be brought onto Government property that does not directly relate to requirements for the performance of this Contract. The Government is not responsible for disposal of Contractor's waste material brought on the job site and not required in the performance of this Contract. The intent of this provision is to dispose of that waste identified as hazardous material/hazardous waste as defined herein that was generated as part of this Contract and existed within the boundary of the Contract limits and not brought in from offsite by the Contractor. Incidental materials used to support the Contract including, but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive. The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or to the river or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer.

3.9 HAZARDOUS MATERIAL MANAGEMENT

No hazardous material must be brought onto Government property that does not directly relate to requirements for the performance of this Contract.

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Submit a SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the Activity. 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. At the end of the project, provide the Contracting Officer with 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. Ensure that hazardous materials are utilized in a

manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Keep copies of the SDS for hazardous materials on site at all times and provide them to the Contracting Officer at the end of the project. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

3.10 PETROLEUM PRODUCTS AND REFUELING

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while on-site exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents will be considered a hazardous waste and must be disposed of at Contractor's expense. Used oil mixed with a hazardous waste must also be considered a hazardous waste.

Note: Characterization and disposal requirements vary from state to state. Waste determinations and disposal requirements must be coordinated with the Contracting Officer prior to used motor oil disposal occurring.

3.10.1 Oily and Hazardous Substances

Prevent oil or hazardous substances from entering the ground, drainage areas, or navigable waters. In accordance with 40 CFR 112, surround all temporary fuel oil or petroleum storage tanks with a temporary berm or containment of sufficient size and strength to contain the contents of the tanks, plus 10 percent freeboard for precipitation. The berm must be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs.

3.10.2 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, the Contractor must immediately notify the Contracting Officer. The Contractor must not disturb this material until authorized by the Contracting Officer.

3.11 FUEL TANKS

Petroleum products and lubricants required to sustain up to 30 days of construction activity may be kept on site. Storage and refilling practices must comply with 40 CFR Part 112. Secondary containment must be provided and be no less than 110 percent of the tank volume plus five inches of free-board. If a secondary berm is used for containment then the berm must be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Drips pans are required and the tanks must be covered during inclement weather.

Navy Environmental Office approval must be obtained for any fuel tanks being used as part of a Contract.

3.12 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

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 by environmental law. 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 Activity Fire Department, the Activity's Command Duty Officer, and the Contracting Officer. If the Contractor's response is inadequate, the Navy may respond. If this should occur, the Contractor must be required to reimburse the Government for spill response assistance and analysis.

The Contractor is responsible for verbal and written notifications as required by the Federal 40 CFR 355, State, local regulations and Navy Instructions. Spill response must be in accordance with 40 CFR 300 and applicable State and local regulations. All communications of spills to outside agencies, including regulatory agencies, will be made by the Navy, not the Contractor. Contain and clean up these spills without cost to the Government. If Government assistance is requested or required, the Contractor must reimburse the Government for such assistance. Provide copies of the written notification and documentation that a verbal notification was made within 20 days.

Maintain spill cleanup equipment and materials at the work site. Clean up all hazardous and non-hazardous (WHM) waste spills. The Contractor must reimburse the Government for all material, equipment, and clothing generated during any spill cleanup. The Contractor must reimburse the Government for all costs incurred including sample analysis materials, equipment, and labor if the Government must initiate its own spill cleanup procedures, for Contractor responsible spills, when:

a. The Contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence; or

b. If, in the Government's judgment, the Contractor's spill cleanup is not adequately abating life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

3.13 CONTROL AND MANAGEMENT OF HAZARDOUS WASTES

At the time of the pre construction conference the Contractor will be briefed and provided written information regarding hazardous waste management. The Government will provide technical and oversight assistance in all aspects of hazardous waste management.

3.13.1 General

Contractor must not bring hazardous wastes onto Government property. Hazardous wastes must be handled in compliance with 40 CFR 260-268, 273, 279 and State of Maine MEDEP Regulations Chapter 850 to 855. For hazardous waste spills, the Contractor must call the Activity Fire Department, immediately, then verbally notify the Contracting Officer.

3.13.2 Facility Hazardous Waste Generator Status

All work conducted within the boundaries of this Activity must meet the regulatory requirements of this generator designation. The Contractor must comply with all provisions of Federal, State and local regulatory requirements applicable to this generator status regarding training and storage, handling, and disposal of all construction derived wastes.

3.13.3 Hazardous Waste/Debris Management

Refer to the reports in Attachment B at the end of this section for hazardous materials testing performed. Identify all construction activities which will generate hazardous waste/debris. Provide a documented waste determination for all resultant waste streams. Hazardous waste/debris must be identified, labeled, handled, stored, and disposed of in accordance with all 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.

Hazardous waste and universal wastes must also be managed in accordance with the approved Hazardous Waste Management Section of the Environmental Management Plan. 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 must be identified as being generated by the Government.

Prior to removal of any hazardous waste from Government property, all hazardous waste manifests must be signed by ActivityR personnel from the Activity Environmental Office. No hazardous waste must be brought onto Government property. Provide to the Contracting Officer 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. For hazardous wastes spills, verbally notify the Contracting Officer immediately.

3.13.3.1 Regulated Waste Storage/Satellite Accumulation/90 Day Storage Areas

If the work requires the temporary storage/collection of regulated or hazardous wastes, the Contractor must request the establishment of a Regulated Waste Storage Area, a Satellite Accumulation Area, or a 90 Day Storage Area at the point of generation. The Contractor must submit a request in writing to the Contracting Officer providing the following information:

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 Site Plan to the Request)

Attach a waste determination form. Allow ten working days for processing this request. The designated area where waste is being stored must be barricaded and a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.13.3.2 Sampling and Analysis of HW

a. Waste Sampling

Sample waste in accordance with Navy Environmental Compliance Sampling and Field Testing Procedures Manual, NAVSEA T0300-AZ-PRO-010, 01 April 2013. Each sampled drum or container will be clearly marked with the Contractor's identification number and cross referenced to the chemical analysis performed.

b. Laboratory Analysis

Follow the analytical procedure and methods in accordance with the EP-SLU-846. The Contractor will provide all analytical results and reports performed to the Contracting Officer and Environmental Sampling Project Manager.

All laboratory analysis for hazardous waste identification must be performed by a laboratory complaint with OPNAVINST 5090.1 Chapter 7-3.3. Proof of compliance must be made available upon request. All analyses provided by laboratories that are not compliant with the stated requirements will be rejected.

c. Analysis Type

Identify waste material/hazardous waste by analyzing for properties that are reasonably suspected of the waste. Soil and other materials may require specific analysis for acceptance to a disposal facility - please check with personnel at the HWSF before choosing parameters.

3.13.3.3 Asbestos Certification

Items, components, or materials disturbed by or included in work under this Contract do not involve asbestos. Other materials in the general area around where work will be performed may contain asbestos. All thermal insulation, in all work areas, should be considered to be asbestos unless positively identified by conspicuous tags or previous laboratory analysis certifying them as asbestos free.

Inadvertent discovery of non-disclosed asbestos that will result in an abatement action requires a change in scope before proceeding. Upon

discovery of asbestos containing material not identified in the Contract Documents, the Contractor must immediately stop all work that would generate further damage to the material, evacuate the asbestos exposed area, and notify the Contracting Officer for resolution of the situation prior to resuming normal work activities in the affected area. The Contractor must not remove or perform work on any asbestos containing materials without the prior approval of the Contracting Officer. The Contractor must not engage in any activity, which would remove or damage such materials or cause the generation of fibers from such materials.

Asbestos containing waste must be managed and disposed of in accordance with applicable environmental law. Asbestos containing waste must be manifested and the manifest provided to the Contracting Officer. Disposal of asbestos-containing waste must be coordinated with the Navy.

The Contractor must also provide the attached Asbestos Free Certification Form (Attachment A) prior to the Government taking beneficial occupancy certifying that all materials, including those supplied by third parties, are asbestos free.

3.13.3.4 Hazardous Waste Disposal

No hazardous, toxic, or universal waste must be disposed or hazardous material abandoned on Government property. And unless otherwise noted in this Contract, the Government is not responsible for disposal of Contractor generated waste material. The disposal of incidental materials used to accomplish the work including, but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive.

The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or water way or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer.

Control of stored waste, packaging, sampling, analysis, and disposal must be determined by the details in the Contract. The requirements for jobs in the following paragraphs must be used as the guidelines for disposal of any hazardous waste generated.

a. Responsibilities for Contractor's Disposal

Contractor responsibilities include any generation of WHM/HW requiring Contractor disposal of solid waste or liquid.

(1) The Contractor agrees to provide all service necessary for the final treatment/disposal of the hazardous material/waste in accordance with all local, State and Federal laws and regulations, and the terms and conditions of the Contract within sixty (60) days after the materials have been generated. These services must include all necessary personnel, labor, transportation, packaging, detailed analysis (if required for disposal, and/or transportation, including manifesting or completing waste profile sheets, equipment, and the compilation of all documentation is required).

(2) Contain all waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273,

40 CFR 279, 40 CFR 280, and 40 CFR 761.

(3) Obtaining a representative sample of the material generated for each job done to provide waste stream determination.

(4) Analyzing for each sample taken and providing analytical results to the Contracting Officer. Provide two copies of the results.

(5) Determine the DOT proper shipping names for all waste (each container requiring disposal) and must demonstrate how this determination is developed and supported by the sampling and analysis requirements contained herein to the Contracting Officer.

Contractor Disposal Requirements

For any hazardous waste materials or hazardous waste generated which requires the Contractor to dispose of, the following conditions must be complied with in order to be acceptable for disposal:

a. Drums compatible with waste contents and drums meet DOT requirements for 49 CFR 173 for transportation of materials;

b. Drums banded to wooden pallets. No more than three (3) 55 gallon drums to a pallet, or two (2) 85 gallon over packs;

c. Band using 1-1/4 inch minimum band on upper third of drum;

d. Recovery materials label located in middle of drum, filled out to indicate actual volume of material, name of material manufacturer, other vendor information as available; and

e. Always have three (3) to five (5) inches of empty space above volume of material. This space is called 'outage'.

f. Provide disposal documentation for hazardous and regulated waste.

3.13.4 Class I and II ODS Prohibition

Class I and II ODS as defined and identified herein will not be used in the performance of this Contract, nor be provided as part of the equipment. This prohibition will be considered to prevail over any other provision, specification, drawing, or referenced documents. Regulations related to the protection of stratosphere ozone may be found in 40 CFR 82.

Heating and air conditioning technicians must be certified through an EPA-approved program. Copies of certifications must be maintained at the employees' place of business and be carried as a wallet card by the technician, as provided by environmental law. Accidental venting of a refrigerant is a release and must be reported to the Contracting Officer.

3.13.4.1 Universal Waste/e-Waste Management

Universal waste including, but not limited to, some mercury containing building products such as fluorescent lamps, mercury vapor lamps, high-pressure sodium lamps, CRTs, batteries, aerosol paint containers, electrical equipment containing PCBs, and consumed electronic devices, must be managed in accordance with applicable environmental law and Activity instructions.

3.14 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. Runoff from cutting water is prohibited from entering storm drains or leaving the work site. Do not unnecessarily shake bags of cement, concrete mortar, or plaster. When temporary dust control measures are employed, repetitive treatment must be applied as needed to accomplish control. Visible emissions from a fugitive emission source (including stockpiles and roadways) must not exceed an opacity of 20 percent, except for no more than five (5) minutes in any 1-hour period.

Dust suppression during demolition work may include using a manned water hose. Runoff from the site is prohibited.

3.14.1 Dirt and Dust Control Plan

Submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on Activity 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.

3.15 ABRASIVE AND/OR WET BLASTING

3.15.1 Blasting Operations

(a) Abrasive Blasting

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 in accordance with the requirements specified. Perform work involving removal of hazardous material in accordance with 29 CFR 1910.

Abrasive blasting must take place in containments with emissions vented through bag house filters and emissions must be limited to 10% opacity on a six minute block average. The bag houses must be used to control PM emission and operated properly at all times abrasive blasting is being performed.

(b) Wet Blasting and Water Cutting

The use of wet blasting and water cutting requires the capture and proper disposal of all wastes, including the blasting and water cutting water, associated with the process. Provide enclosed containments to confine and collect wastewater and debris.

3.15.2 Disposal Requirements

Submit analytical results of the debris generated from abrasive blasting operations per paragraph entitled Laboratory Analysis of this section. Hazardous waste generated from blasting operations must be managed in

accordance with paragraph entitled "Hazardous Waste/Debris Management" of this section and with the approved HWMP. Disposal of non-hazardous abrasive blasting debris must be in accordance with paragraph entitled, "Control and Disposal of Solid Wastes".

3.16 SPRAY PAINTING

3.16.1 Spray Painting Operations

Spray painting operations must take place in containment. Emissions from spray painting must vent through air filters and are limited to 10% opacity on a six minute block average. The air filters are used to control particulate emissions.

3.17 NOISE

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives will not be permitted without written permission from the Contracting Officer, and then only during the designated times.

3.18 MERCURY MATERIALS

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 Activity in an unbroken condition for disposal as directed. Immediately report to the Activity Environmental Office and the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Cleanup of a mercury spill must not be recycled and must be managed as a hazardous waste for disposal.

3.19 CONCRETE WASH WATER

Concrete wash water must be defined as water, pressure washing water, or storm water that has come into contact with cement, uncured concrete, concrete dust or other material of a similar nature generated during construction activities including, but not limited to, washing down ready-mix trucks, mixers and wheelbarrows, precasting equipment, forms, manufactured cast concrete sections, tools, concrete areas; masonry cutting operations; cleaning up of split mortar or block fill; hosing away excess materials.

Water or storm water that has come into contact with pre casting equipment, forms, tools, etc which have been subjected to oil based form release agents will be considered an oily waste if a visual inspection indicates any signs of oil residual. Oily wastes must be collected and disposed of in accordance with Activity policy.

Concrete wash water must be gathered and contained on site for removal and disposal at a facility designed and approved for disposal of concrete wash water. Under no circumstances must clean water be added to concrete wash water for dilution purposes or any other reason. Containment structures must be watertight and provide adequate freeboard to contain the wash

water, solids, and rainfall to prevent overflow. Cover wash out structures prior to predicted rainfall events to prevent rainfall from entering the containment structure. Ensure that concrete washout containers are watertight and are designed to promote evaporation. Washout must occur in designated areas only that have been approved by the Contracting Officer's Representative.

Inspect all concrete washout facilities daily to determine filled capacity. Remove all materials from containment structures when 75% fill capacity has been reached. Remove liquids or cover structures before predicted rainstorms to prevent overflows and infiltration of rainwater. Inspect structures for holes and tears daily and repair to maintain watertight conditions.

Hardened solids can be removed from containment structures and recycled, reused, or disposed of per regulatory requirements. Liquids remaining in the containment structure must be vacuumed and disposed of at a facility designated for disposal of concrete wash water.

3.19.1 Pollution Prevention

Store dry and wet concrete supplies under cover away from drainage areas. Concrete wash water must not be released to the storm drain system, sewer system, roadways or other uncontained impervious surfaces, or to natural waterways. Contractor must take all precautions necessary to prevent rainwater or stormwater runoff to come in contact with concrete wash water. Divert clean stormwater and roof runoff from contact with concrete wash water. Contractor must take all measures necessary to minimize the volume of concrete wash water generated. Contractor must protect all waterways, catch basins and storm drain structures from potential discharges of concrete wash water. Contractor must collect and control concrete wash water separately from waste water determined to be oily waste.

3.19.2 On-Activity Disposal

Small volumes of concrete wash water generated can be disposed on-site under certain conditions when approved by the Contracting Officer. When approved, small volumes of concrete wash water can be directed onto an area of open soil such as a trench or shallow pit to allow it to be absorbed and neutralized by the soil. The area must be constantly monitored during filling operations to prevent overflow.

3.19.3 Off-Activity Disposal

Contractor must provide careful oversight to prevent improper dumping of concrete wash water. Contractor must ensure companies use proper disposal facilities designated for concrete wash water disposal. The Contractor must be responsible for any clean up resulting from improper control of concrete wash water.

3.20 DISPOSAL OF CHLORINATED WATER AND DECHLORINATION REQUIREMENTS

Chlorinated water created during disinfection procedures must not be directly discharged to storm drains or sanitary sewers without prior dechlorination. Chlorinated water must be neutralized by the controlled addition of a reducing chemical such as sodium thiosulfate, sodium bisulfate, sodium sulfite, sulfur dioxide or ascorbic acid (commonly known as Vitamin C). Dechlorination must be sufficiently effective to reduce

total residual chlorine concentration to existing water system chlorine levels (typically 1.2 to 1.5 mg/l).

-- End of Section --

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
02/19, CHG 1: 08/20

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Co-mingle

The practice of placing unrelated materials together in a single container, usually for benefits of convenience and speed.

1.1.2 Construction Waste

Waste generated by construction activities, such as scrap materials, damaged or spoiled materials, temporary and expendable construction materials, and other waste generated by the workforce during construction activities.

1.1.3 Demolition Debris/Waste

Waste generated from demolition activities, including minor incidental demolition waste materials generated as a result of Intentional dismantling of all or portions of a building, to include clearing of building contents that have been destroyed or damaged.

1.1.4 Disposal

Depositing waste in a solid waste disposal facility, usually a managed landfill, regulated in the US under the Resource Conservation and Recovery Act (RCRA).

1.1.5 Diversion

The practice of diverting waste from disposal in a landfill, by means of eliminating or minimizing waste, or reuse of materials.

1.1.6 Final Construction Waste Diversion Report

A written assertion by a material recovery facility operator identifying constituent materials diverted from disposal, usually including summary tabulations of materials, weight in short-ton.

1.1.7 Recycling

The series of activities, including collection, separation, and processing, by which products or other materials are diverted from the solid waste stream for use in the form of raw materials in the manufacture of new products sold or distributed in commerce, or the reuse of such materials as substitutes for goods made of virgin materials, other than fuel.

1.1.8 Reuse

The use of a product or materials again for the same purpose, in its

original form or with little enhancement or change.

1.1.9 Salvage

Usable, salable items derived from buildings undergoing demolition or deconstruction, parts from vehicles, machinery, other equipment, or other components.

1.1.10 Source Separation

The practice of administering and implementing a management strategy to identify and segregate unrelated waste at the first opportunity.

1.2 CONSTRUCTION WASTE (INCLUDES DEMOLITION DEBRIS/WASTE)

Divert a minimum of 60 percent by weight of the project construction waste and demolition debris/waste from the landfill. Follow applicable industry standards in the management of waste. Apply sound environmental principles in the management of waste. (1) Practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction waste and demolition debris/waste from landfills and incinerators and to facilitate the recycling or reuse of excess construction materials.

1.3 CONSTRUCTION WASTE MANAGEMENT

Implement a construction waste management program for the project. Take a pro-active, responsible role in the management of construction construction waste, recycling process, disposal of demolition debris/waste, and require all Subcontractors, vendors, and suppliers to participate in the construction waste management program. Establish a process for clear tracking, and documentation of construction waste and demolition debris/waste.

1.3.1 Implementation of Construction Waste Management Program

Develop and document how the construction waste management program will be implemented in a construction waste management plan. Submit a Construction Waste Management Plan to the Contracting Officer for approval. Construction waste and demolition debris/waste materials include un-used construction materials not incorporated in the final work, as well as demolition debris/waste materials from demolition activities or deconstruction activities. In the management of waste, consider the availability of viable markets, the condition of materials, the ability to provide material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates.

1.3.2 Oversight

The Environmental Manager, as specified in Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS (AOR), is responsible for overseeing and documenting results from executing the construction waste management plan for the project and is responsible for all waste being disposed of in accordance with the Contract Documents and state and Federal regulations. If any waste materials are removed from the Activity not in compliance with the requirements stated in the Contract Documents, the person assigned as the Environmental Manager is subject to removal by the Contracting Officer for non-compliance with requirements specified in the

Contract. 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. The Contractor will be responsible to take all required actions to address and correct any non-compliance as well as paying any fines as a result of improper handling or disposal. This will reflect poorly on the Prime Contractor's performance rating (CPARS) and noted in their final performance evaluation.

1.3.3 Special Programs

Implement any special programs involving rebates or similar incentives related to recycling of construction waste and demolition debris/waste materials. Retain revenue or savings from salvaged or recycling, unless otherwise directed. Ensure firms and facilities used for recycling, reuse, and disposal are permitted for the intended use to the extent required by Federal, State, and local regulations.

1.3.4 Special Instructions

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 projects. Designation of single source separating or commingling will be clearly marked on the containers.

1.3.5 Waste Streams

Delineate waste streams and characterization, including estimated material types and quantities of waste, in the construction waste management plan. Manage all waste streams associated with the project. Typical waste streams are listed below. Include additional waste steams not listed:

a. Land Clearing Debris

b. Asphalt

c. Masonry and CMU

d. Concrete

e. Metals (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, bronze, etc.)

f. Wood (nails and staples allowed)

g. Glass

h. Paper

i. Plastics (PET, HDPE, PVC, LDPE, PP, PS, Other)

j. Gypsum

k. Non-hazardous paint and paint cans

l. Carpet

m. Ceiling Tiles

n. Insulation

o. Beverage Containers

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Waste Management Plan; G

SD-11 Closeout Submittals

Final Construction Waste Diversion Report

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 construction waste management plan and to develop a mutual understanding relative to the management of the construction waste management program and how waste diversion requirements will be met.

The requirements of this meeting may be fulfilled during the coordination and mutual Understanding meeting outlined in Section 01 45 00.00 22 QUALITY CONTROL (PWD ME). At a minimum, discuss and document waste management goals at following meetings:

a. Preconstruction meeting.

b. Regular Quality Control meetings.

c. Work safety meeting (if applicable).

1.6 CONSTRUCTION WASTE MANAGEMENT PLAN

Submit Construction Waste Management Plan within 15 calendar days after Contract Award. Revise and resubmit Construction Waste Management Plan until it receives final approval from the Contracting Officer, in order for construction to begin. Execute demolition or deconstruction activities in accordance with Section 02 41 00 DEMOLITION. Manage demolition debris/waste or deconstruction materials in accordance with the approved construction waste management plan.

An approved construction waste management plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Ensure all Subcontractors receive a copy of the approved Construction Waste Management Plan. The plan demonstrates how to meet the project waste diversion requirement. Also, include the following in the plan:

a. Identify the names of individuals responsible for waste management and

waste management tracking, along with roles and responsibilities on the project.

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 materials.

e. Name of landfill and/or incinerator to be used.

f. Identification of local and regional re-use programs, including non-profit organizations such as schools, local housing agencies, and organization that accept used materials such as material exchange networks and resale stores. Include the name, location, phone number for each re-use facility identified, and provide a copy of the permit or license for each facility.

g. List of specific materials, by type and quantity, 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, address, and phone number.

h. Identification of materials that cannot be recycled or reused with an explanation or justification, to be approved by the Contracting Officer.

i. Description of the means by which any materials identified in item (g) above will be protected from contamination.

j. 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).

k. Copy of training plan for Subcontractors and other services to prevent contamination by co-mingling materials identified for diversion and waste materials.

Distribute copies of the waste management plan to each Subcontractor, Environmental Manager, and the Contracting Officer.

1.7 RECORDS (DOCUMENTATION)

1.7.1 General

Maintain records to document the types and quantities of waste generated and diverted though re-use, recycling and/or sale to third parties; through disposal to a landfill or incinerator facility. Provide explanations for any materials not recycled, reused or sold. Collect and retain manifests, weight tickets, sales receipts, and invoices specifically identifying diverted project waste materials or disposed materials.

1.7.2 Accumulated

Maintain a running record of materials generated and diverted from landfill disposal, including accumulated diversion rates for the project. Make records available to the Contracting Officer during construction or incidental demolition activities. Provide a copy of the diversion records to the Contracting Officer upon completion of the construction, incidental demolitions, or minor deconstruction activities.

1.8 FINAL CONSTRUCTION WASTE DIVERSION REPORT

A Final Construction Waste Diversion Report is required at the end of the project. Provide the Contracting Officer with the Final Construction Waste Diversion Report 60 days prior to the Beneficial Occupancy Date (BOD).

1.9 COLLECTION

Collect, store, protect, and handle reusable and recyclable materials at the site in a manner which prevents contamination, and provides protection from the elements to preserve their usefulness and monetary value. Provide receptacles and storage areas designated specifically for recyclable and reusable materials and label them clearly and appropriately to prevent contamination from other waste materials. Keep receptacles or storage areas neat and clean.

Train Subcontractors and other service providers to either separate waste streams or use the co-mingling method as described in the construction waste management plan. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS (AOR). Separate materials by one of the following methods described herein:

1.9.1 Source Separation Method

Separate waste products and materials that are recyclable from trash and sort as described below into appropriately marked separate containers and then transport 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 category types as defined in the construction waste management plan.

1.9.2 Other Methods

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

1.10 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 as described in the waste management plan. Except as otherwise specified in other Sections of the specifications, dispose of in accordance with the following:

1.10.1 Reuse

Give first consideration to reusing construction and demolition materials as a disposition strategy. Recover for reuse materials, products, and components as described in the approved construction waste management plan. Coordinate with the Contracting Officer to identify onsite reuse opportunities or material sales or donation available through Government resale or donation programs. Sale of recovered materials is not allowed on the Activity.

1.10.2 Recycle

Recycle non-hazardous construction and demolition/debris materials that are not suitable for reuse. Track rejection of contaminated recyclable materials by the recycling facility. Rejected recyclables materials will not be counted as a percentage of diversion calculation. Recycle all fluorescent lamps, HID lamps, mercury (Hg) -containing thermostats and ampoules, and PCBs-containing ballasts and electrical components as directed by the Contracting Officer. Do not crush lamps on site as this creates a hazardous waste stream with additional handling requirements.

1.10.3 Waste

Dispose by landfill or incineration only those waste materials with no practical use, economic benefit, or recycling opportunity.

1.11 ADDITIONAL REPORTING AND RECORDING REQUIREMENTS

Provide monthly cost and revenue data to the NAVFAC Midlant Integrated Solid Waste Management office. Submit report by e-mail to: IntegratedSolidWasteManagement@navy.mil no later than the 3rd of each month. Data must be reported on an excel document provided by the Contracting Officer. Comply with the requirements specified in Appendix 01 74 19-1, CONSTRUCTION AND DEMOLITION SOLID WASTE REPORT.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 78 00.00 22

CLOSEOUT SUBMITTALS (PWD ME)
05/21

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) Standard Guide for Stewardship for the Cleaning of Commercial and Institutional Buildings

GREEN SEAL (GS)

GS-37	(2017) Cleaning Products for Industrial and Institutional Use

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014; with Change 4, 2018) Navy and Marine Corps Design
UFC 1-300-08	(2009, with Change 2, 2011) Criteria for Transfer and Acceptance of DoD Real Property

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are the marked-up drawings, maintained by the Contractor on-site, that depict actual conditions and deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: Contract modifications; official responses to submitted Requests for Information (RFI's); direction from the Contracting Officer; design that is the responsibility of the Contractor; and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site. These files serve as the basis for the creation of the record 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.

1.4 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-03 Product Data

Warranty Management Plan

One (1) paper and one (1) pdf set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags

Two (2) paper record copies and one pdf copy of the warranty tags showing the layout and design.

Final Cleaning

Two (2) copies of the listing of completed final clean-up items.

Spare Parts Data

Two (2) paper copies and one pdf copy of the list that indicates manufacturer's name, part number, nomenclature, and stock level recommended for maintenance and repair. List those items that may be standard to the normal maintenance of the systems.

SD-08 Manufacturer's Instructions

Preventative Maintenance; G and Condition Monitoring (Predictive Testing); G and Inspection; G schedules with instructions that state when systems should be retested.

Define within the schedule the anticipated length of each test, test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements. On each test feature; e.g., gpm, rpm, psi, provide a signoff blank for the Contractor and Contracting Officer. Within a remarks column of the testing validation procedure include references to operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventative maintenance, condition monitoring (predictive testing) and inspection, adjustment, lubrication, and cleaning necessary to prevent failure.

Posted Instructions

SD-10 Operation and Maintenance Data

Maintenance Manuals; G

Comply with the requirements specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA for O&M Data format. Refer to Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND

MAINTENANCE SUPPORT INFORMATION (eOMSI) for additional requirements.

SD-11 Closeout Submittals

As-Built Drawings; G

Record Drawings; G

Drawings showing final as-built conditions of the project. The final CADD record drawings must consist of one (1) set of electronic CADD drawing files in the specified electronic format saved on a CD, one (1) set of mylar drawings, two (2) sets of blue-line prints of the mylars, and one (1) set of the approved working Record drawings.

As-Built Record of Equipment and Materials

Two (2) paper copies and one pdf copy of the record listing the as-built materials and equipment incorporated into the construction of the project.

Certification of EPA Designated Items; G

Certification Of USDA Designated Items; G

Interim DD FORM 1354; G

Checklist for DD FORM 1354; G

Red Zone Documents per Section 01 30 00.00 22; G

eOMSI, Final Submittal per Section 01 78 24.00 20; G

1.5 SPARE PARTS DATA

Submit two (2) copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, and stock level required for test and balance, pre-commissioning, maintenance and repair activities. List those items that may be standard to the normal maintenance of the system.

Supply two (2) items of each part for spare parts inventory. Provision of spare parts does not relieve the responsibilities listed under the Contract warranty provisions.

1.6 WARRANTY MANAGEMENT

1.6.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to FAR 52.246-21 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 narrative must 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. Submit warranty information, made available during the construction phase, 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 must begin on the date of project acceptance and continue for the full product warranty period. Conduct a joint 4 month and 9 month warranty inspection, measured from time of acceptance; with the Contractor, Contracting Officer and the Customer Representative. The warranty management plan must include, but is not limited to, the following:

a. Roles and responsibilities of 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. For each warranty, the name, address, telephone number, and e-mail of each of the guarantor's representatives nearest to the project location.

c. A list and status of delivery of Certificates of Warranty for extended warranty items, including roofs, HVAC balancing, pumps, motors, transformers, and for commissioned systems, such as fire protection and alarm systems, sprinkler systems, and lightning protection systems.

d. As-Built Record of Equipment and Materials 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 warranties longer than one year 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 equipment covered by warranties longer than one year.

g. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty or safety reasons.

1.6.2 Performance Bond

The Performance Bond must remain effective throughout the construction and warranty 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. At this meeting, establish and review 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 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 must 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.	

1.7 PROJECT CLOSEOUT DOCUMENTS

1.7.1 As-Built Record of Equipment and Materials

Furnish one (1) copy of preliminary record of equipment and materials used on the project 15 working days prior to final inspection. This preliminary submittal will be reviewed and returned 5 working days after final inspection with Government comments. Submit two (2) sets of final record of equipment and materials 10 working days after final inspection. Key the designations to the related area depicted on the Contract Drawings. List the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.7.2 Final Approved Shop Drawings

Furnish final approved project shop drawings 30 calendar days after transfer of the completed facility.

1.7.3 Construction Contract Specifications

Furnish final record (as-built) construction Contract Specifications, including modifications thereto, 30 calendar days after transfer of the

completed facility.

1.7.4 Real Property Equipment

Furnish a list of installed equipment furnished under this Contract. Include all information usually listed on a manufacturer's name plate. In the "EQUIPMENT-IN-PLACE LIST" include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. Furnish a draft list at time of transfer. Furnish the final list 30 calendar days after transfer of the completed facility.

1.7.5 Red Zone Documents

Submit Red Zone Documents in accordance with Section 01 30 00.00 22 ADMINISTRATIVE REQUIREMENTS (PWD ME). Failure to provide acceptable and timely Red Zone Documents as specified may reflect poorly on the Prime Contractor's performance evaluation.

1.7.6 eOMSI, Final Submittal

Submit eOMSI, Final Submittal in accordance with Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI). Failure to provide an acceptable and timely final eOMSI submittal as specified may reflect poorly on the Prime Contractor's performance evaluation.

1.8 PREVENTATIVE MAINTENANCE

Submit Preventative Maintenance and Condition Monitoring (Predictive Testing) and Inspection schedules with instructions that state when systems should be retested.

Define the anticipated length of each test, test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a signoff blank for the Contractor and the Contracting Officer for each test feature; e.g., gpm, rpm, psi. Include 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 preventative maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize corrective maintenance and repair.

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.

1.9 FINAL CLOSEOUT DOCUMENTS

Failure to provide acceptable closeout documents as specified above may reflect poorly on the Prime Contractor's performance and noted in their final performance evaluation.

PART 2 PRODUCTS

2.1 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9 Estimate of Percentage of Recovered Material Content for EPA Designated Items and FAR 52-223-17 Affirmative Procurement of EPA designated items in Service and Construction Contracts. 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:

a. The product does not meet appropriate performance standards;

b. The product is not available within a reasonable time frame;

c. The product is not available competitively (from two or more sources);

d. 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 content, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, exemptions (a, b, c, or d, as indicated), and comments. Recycled content values may be determined by weight or volume percent, but must be consistent throughout.

2.2 CERTIFICATION OF USDA DESIGNATED ITEMS

Submit the Certification of USDA Designated Items as required by FAR 52-223-1 Bio-based Product Certifications and FAR 52.223-2 Affirmative Procurement of Biobased Products Under Service and Construction Contracts. 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 USDA standards for biobased materials content. The following exemptions may apply to the non-procurement of biobased content materials:

a. The product does not meet appropriate performance standards;

b. The product is not available within a reasonable time frame;

c. The product is not available competitively (from two or more sources);

d. The product is only available at an unreasonable price (compared with a comparable bio-based content product)."

Record each product used in the project that has a requirement or option of containing biobased content, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled

content, exemptions (a, b, c, or d, as indicated), and comments. 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 two black line print copies of the PDF Contract Drawings for As-Built Drawings. Maintain the as-builts throughout construction as red-lined hard copies on site and red-lined PDF files. 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 item(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, manholes, utility structures, 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 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, and foundations.

f. The topography, invert elevations and grades of drainage structures and pipes 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.

l. Modifications and compliance with FC 1-300-09N procedures.

m. Actual location of anchors, construction and control joints, etc., in concrete.

n. Unusual or uncharted obstructions that are encountered in the Contract work area during construction.

o. 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 and Source Documents in accordance with FC 1-300-09N. Provide four copies of Record Drawings and Documents on separate CDs or DVDs 30 days after BOD.

3.3 PROJECT RECORD DOCUMENTS

3.3.1 Record Drawings

This paragraph covers Record Drawings complete, as a requirement of the Contract. The terms "drawings," "Contract Drawings," "drawing files," "working as-built record drawings," and "final record drawings" refer to Contract Drawings (hard copy and CADD) which are revised to be used for final record drawings reflecting current project as-built conditions.

3.3.1.1 Government Furnished Materials

One (1) set of electronic CADD files in the specified software and format of the Contract Drawings will be provided by the Government at the preconstruction conference for projects requiring Final Record Drawings in CADD format.

3.3.1.2 Working Record and Final Record Drawings

Revise two (2) sets of hard copy paper Contract Drawings by red-line process described herein to reflect the current as-built conditions during the prosecution of the project. Keep the working as-built drawings current and keep at least one set available on the jobsite for review at all times. Changes from the Contract plans which are made in the work or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. **After the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project) provide one (1) set of working as-built drawings (CADD) in the specified software and format, hard copy and electronic, to the Contracting Officer.** The working as-built drawings, hard copy and (CADD), will be jointly reviewed for accuracy, completeness, and format by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. Failure to maintain the working as-built drawings, hard copy and (CADD) as specified herein, will result in the Contracting Officer deducting 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. Items to be shown on the working as-built drawings, hard copy and (CADD) are, but are not limited to, the following information:

a. The actual location (horizontal and vertical position based on the

datum established for the Contract Documents, 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, as a back-up to the horizontal and vertical position, feature must also be shown by offset dimensions to two (2) permanently fixed surface features at the end of each run including each change in direction. Locate valves, manholes, utility structures, 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 of pipe, fittings, valves, manholes, utility structures, etc.

b. The actual location (horizontal and vertical position based on the datum established for the Contract Documents, kind, and size of any sub-surface feature uncovered not accurately represented on the Contract Drawings.

c. The location and dimensions of any changes within the building structure.

d. Changes in grade, elevations, cross section, or alignment of roads, earthwork, structures, or utilities.

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, 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 modifications which result from the final inspection.

h. Where Contract Drawings or specifications present options, identify the option selected for construction on the working as-built prints.

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. Modifications (include within change order price the cost to change working and final record drawings to reflect modifications) and compliance with the following procedures:

(1) Both sets of the hard copy paper Contract working as-built drawings must be neat, legible, and accurate. Any drawings damaged, lost or corrupted by the Contractor must be satisfactorily replaced by the Contractor at no expense to the Government.

(2) For text deletions/revisions; strikeout existing drawing text with a single line as to not obscure or make the original text unreadable. Place the new text adjacent, clearly annotating the intent of the change.

(3) For line work; strikeout entities with parallel lines drawn at 45 degrees to the object, not to obscure or make the original object unreadable. Place the new object in its correct location and clearly annotate the intent of the change.

(4) Place a Revision Symbol at the location of each modification on the drawing sheet along with descriptive annotations of the revision.

(5) For details, sections, or schedules which are added to a drawing sheet, place a Revision Symbol by the detail, section, or schedule title.

(6) For major changes to a drawing, place a Revision Symbol by the title of the affected plan, section, or detail at each location.

(7) For changes within schedules, place a Revision Symbol by the change in the schedule.

(8) The Revision Symbol must be a Delta sized to allow for a capital letter to fit within. The letter must have a height of not less than 1/8-inch when plotted.

(9) The revision symbol letter must be consistent for all drawing modifications for each monthly billing cycle. Drawing modifications for the first monthly billing cycle must be designated as "A" for all modifications throughout the drawing package. The next month's revisions must be designated as "B" throughout the drawing package, and so on.

3.3.1.3 Drawing Preparation

At project completion, provide two (2) sets of the approved hard copy paper Contract Drawings modified to reflect the final as-built conditions of the project to the Contracting Officer. Modify the Contract Drawings as necessary to correctly show the features of the project as it has been constructed by bringing the Contract Drawings into agreement with the second set of approved working as-built drawings. The second set of approved working as-built drawings are also part of the permanent records of this project and must be returned to the Contracting Officer after final approval of the Record Drawings by the Government. Any drawings or drawing files damaged, lost or corrupted must be satisfactorily replaced at no expense to the Government.

3.3.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only employ personnel proficient in the preparation of CADD drawings to modify the Contract Drawings or prepare any additional drawings sheets required. Modifications, to the Record Drawings must be equal in quality and detail to that of the original Contract Drawings and per PWD ME CADD Standards and As-Built CADD Standards. (For information on PWD Maine CADD standards, please e-mail Preston Gowen at preston.gowen@navy.mil.)

Line colors, line weights, lettering, layering conventions, and symbols must remain consistent throughout the record drawing set, regardless of either as-built or record drawing. Modify the original Contract Drawing files to reflect the Construction Contract as-built conditions reviewed and accepted by **the Contracting Officer.** Each as-built condition added to a drawing file must be encapsulated by a closed polygon or "revision

cloud." A revision symbol must be placed outside the "revision cloud" with the appropriate letter designating the revision sequence. Annotate in the "revision block" of each drawing file modified as to the type of revisions made to the drawing file. The Contract Drawings are to be edited to reflect the as-built conditions only. No part of the original drawings must be deleted, erased or rendered illegible. Parts of the Contract Drawing found to be in error or modified during construction, must be over struck using methods described not to obscure the original drawing, and annotations must be added adjacent that clearly explain the modification, including accurate dimensions locating the feature. If additional drawings are required, the drawings must be prepared using the specified electronic file format applying, the same graphic standards specified for the original drawings. The title block and drawing border to be used for any new final record drawings must be identical to that used to create the Contract Drawings. Modifications, additions, and corrections to the Contract Drawings must be made to the electronic AutoCAD file(s). The original Contract Drawing files in the AutoCAD software format currently in use by PWD-ME will be furnished on a compact disc (CD). Provide all computer software and hardware necessary to prepare the final record drawing set. The Contracting Officer will review the final record drawing set for accuracy and return them for required corrections, changes, additions, and deletions.

a. Provide Record Drawings (CADD) in the following format:

   (1) As-built Layering; follow original drawing layer naming conventions followed by "-AB".

   (2) Deletions (Cyan) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

   (3) Additions (Cyan) - Added items, lettering in notes and leaders.

   (4) Special (Cyan) - Items requiring special information, coordination, or special detailing or detailing notes.

   (5) Furnish the Contract record drawing files in the AutoCAD software format currently in use by PWD-ME.

b. Drawing files modified for as-built condition must be renamed by adding an underscore and the letters "AB" to the end of the existing file name. Drawing files where no modifications were required must be renamed by adding an underscore and the letters "RD" to the end of the existing file name.

c. When final revisions have been completed to the record drawing set, add the wording "RECORD DRAWINGS / AS-BUILT CONDITIONS" followed by the name of the Contractor in letters at least 3/16 inch high in the lower left hand corner of the cover sheet drawing. Mark all other Contract Drawings in the same location and manner as either "Record Drawing" denoting no revisions on the sheet or "As built Drawing" denoting modifications, additions, or corrections have been made to the drawing sheet. Modify the revision block to reflect either "record drawing", for no changes or "as built drawing", for changes and date for submittal.

d. Within 20 working days after Government approval of all of the working record drawings for a phase of work, prepare the CADD electronic files for that phase of work and submit for Government review and approval.

The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 working days revise the CADD files accordingly at no additional cost to the Government and submit one set of final prints for the completed phase of work to the Government.

e. Within 20 working days of substantial completion of all phases of work, submit the final record drawing package for the entire project. Submit one (1) set of electronic files on compact disc, read-only memory CD-ROM, one (1) set of mylars and one set of the approved working record drawings. They must be complete in all details and identical in form and function to the Contract Drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files, and storage media submitted will become the property of the Government upon final approval. Failure to submit final record drawing files and marked prints as specified will be cause for withholding any payment due under this Contract. Approval and acceptance of final record drawings must be accomplished before final payment is made.

3.4 MAINTENANCE MANUALS

Provide project operation and maintenance manuals as specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA. Refer to Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI) for additional requirements.

3.4.1 Configuration

Operation and Maintenance Manuals must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Bind information in manual format and grouped by technical Sections. Test data must be legible and of good quality. Light-sensitive reproduction techniques are acceptable provided finished pages are clear, legible, and not subject to fading. Pages for vendor data and manuals must have 0.3937-inch holes and be bound in 3-ring, loose-leaf binders. Organize data by separate index and tabbed sheets, in a loose-leaf binder. Binder must lie flat with printed sheets that are easy to read. Caution and warning indications must be clearly labeled.

3.4.2 Training and Instruction

Submit classroom and field instructions in the operation and maintenance of systems equipment where required by the technical provisions. Direct these services using the manufacturer's factory-trained personnel or qualified representatives. Contracting Officer must be given 7 calendar days written notice of scheduled instructional services. Instructional materials belonging to the manufacturer or vendor, such as lists, static exhibits, and visual aids, must be made available to the Contracting Officer.

3.5 CLEANUP

Provide final cleaning in accordance with ASTM E1971 and submit two copies of the listing of completed final clean-up items. Leave site and

surrounding 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. Replace 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 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS (AOR) and 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

3.6 REAL PROPERTY RECORD

Refer to UFC 1-300-08 for instruction on completing the DD FORM 1354. Contact the Contracting Officer for any project specific information necessary to complete the DD FORM 1354.

3.6.1 Interim DD FORM 1354

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete, update draft DD FORM 1354 attached to this Section, and submit an accounting of all installed property with Interim DD FORM 1354. Include any additional assets, improvements, and alterations from the Draft DD FORM 1354.

3.6.2 Completed DD FORM 1354

For convenience, a blank fillable PDF DD FORM 1354 may be obtained at the following link:
www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd1354.pdf

Submit the completed Checklist for DD FORM 1354 of Installed Building Equipment items. Attach this list to the updated DD FORM 1354.

-- End of Section --

Last updated June 18, 2014

NAVFAC MID-ATLANTIC

Public Works Department
Maine

PORTSMOUTH NAVAL SHIPYARD

AS-BUILT CADD STANDARDS

June 2014

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STANDARDS FOR EDITING EXISTING CONTRACT DRAWINGS TO REFLECT AS-BUILT CONDITIONS

Following are the *Standards* for editing existing contract drawings to reflect the construction as-built conditions for **NAVFAC MID-ATLANTIC; Public Works Department Maine (PWD-ME**). The purpose of these *Standards* is to provide a uniform system of drawing formats. This system will be used in retrieving information from the drawings in the future. Also, these *Standards* were established to eliminate various recurring problems encountered when transferring electronic files from non-government sources. All drawings modifications found to be generated outside of these standards will be returned to the drawing provider for correction at no additional cost to the ***GOVERNMENT*.**

As-built Drawings:

Drawing Sets:

The contractor shall maintain at the jobsite one set of full-size hard copy prints of the contract drawings, accurately marked in red with adequate dimensions, to show all variations between the construction actually provided and that indicated or specified in the contract documents, including buried or concealed construction. **Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the contract drawings**. Existing utility lines and features revealed during the course of construction shall also be accurately located and dimensioned, using permanent existing features and station coordinates as a reference. Acceptable features include; building corners, centers of utility manhole covers, fire hydrants, etc. Existing topographic features that differ from those shown on the contract drawings shall also be accurately located and recorded. Where a choice of materials or methods is permitted herein or where variations in scope or character of work from that of the original contract are authorized, the drawings shall be marked to define the construction provided. The representations of such changes shall conform to standard drafting practices and shall include such supplementary notes, legends, and details as necessary to clearly portray the as-built construction. These drawings shall be available for review by the Contracting Officer at all times. Upon completion of the work, the marked up prints shall be certified as correct, signed by the Contractor, and delivered to the Contracting Officer for review by **PWD-ME**. After acceptance of the as-builts, the contractor will add the as-built information to the original contract drawing files and plot new Mylar reflecting the as-built conditions.

Requests for partial payments will not be approved if the marked prints are not kept current. Request for final payment will not be approved until Contracting Officer receives delivery of the original electronic contract drawing CADD files, modified to reflect the as-built conditions and new Mylar plotted to reflect the as-built conditions.

Computer Aided Drafting Design (CADD) As-built Drawings:

File formats:

Although all methods of CADD drawing are permitted, the final product of all computer-aided drawings shall be made compatible with the ***AutoCAD*** currently in use by **PWD-ME** Drawings

created using non-AutoCAD programs that do not support AutoCAD's DWG file format, shall be transferred to the Drawing Interchange Format (DXF).

If the drawing provider's CADD software does not support the DXF format, it is the responsibility of the drawing provider to contact the Contracting Officer who will in turn contact the **PWD-ME** to make special arrangements for file transfer.

Each drawing file must not depend on any other drawing file to completely represent the finished product *(Mylar)*. All drawings found to use dependent external reference drawings, **will be returned to the drawing provider for correction**.

Each drawing file must not depend on any ***"THIRD PARTY"*** utility or software to represent the finished Mylar. Before using any third party software to create a finished product, the drawing provider shall verify that no additional cost or effort is required by the **PWD-ME** to completely represent the finished product *(Mylar).*

Drawing Sheets:

Electronic files of the contract drawings shall be provided to the Contractor following award of the contract. The contractor will add the accepted as-built conditions to the original electronic file of the drawing sheet. If additional sheets need to be added to the contract drawing package because of insufficient sheet space, it is the responsibility of the Contractor to ensure the PWD-ME CADD Drawing Standards are obtained and followed. Additional drawing numbers will be assigned by **PWD-ME** personnel prior to submittal of as-built drawings.

Basic Drawing Standards:

Electronic As-builts:

The contractor shall modify the original contract drawing files to reflect the construction contract as-built conditions reviewed and accepted by **the Contracting Officer.** Each as-built condition added to a drawing file shall be encapsulated by a closed polygon or "revision cloud. A revision symbol shall be placed outside the "revision cloud" with the appropriate letter designating the revision sequence. The contractor shall annotate in the "revision block" of each drawing file modified as to the type of revisions made to the drawing file. The contract drawings are to be edited to reflect the as-built conditions only. No part of the original drawings shall be deleted, erased or rendered illegible. Parts of the contract drawing found to be in error or modified during construction, shall be over struck using methods described not to obscure the original drawing, and annotations will be added adjacent that clearly explain the modification, including accurate dimensions locating the feature.

Drawing Sheet Management:

Where construction projects encompass multiple facilities (buildings) or systems (utilities), all plans, details, legends, notes etc., for an individual facility or system must appear on the drawing sheets for each facility or system. Standardized details must appear on the drawing sheets for each facility or system where they apply. Cross-referencing details between facilities or systems is not permitted.

Drawing Units:

All drawings of buildings, structures, floor plans, etc. are to be drawn full size, with one drawing unit equal to one inch. All site plans, location plans, etc. are to be drawn full size, with one drawing unit equal to one foot. The original drawing's origin shall not be modified.

Entity Management:

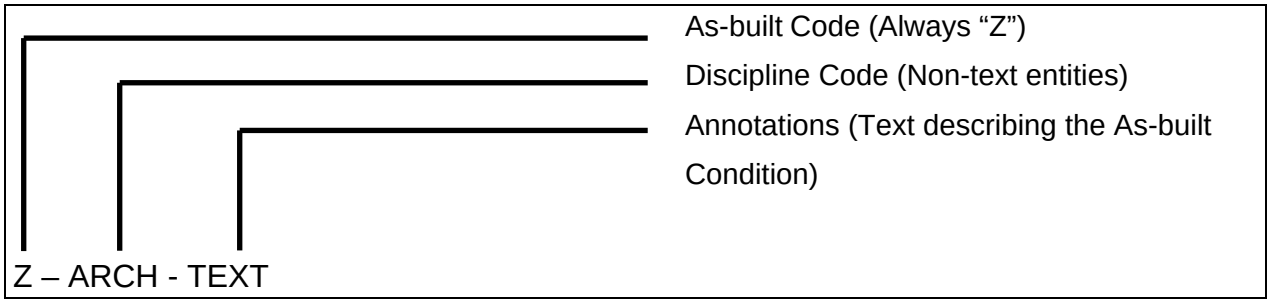
All additions to the original contract drawings will be made on additional layers as designated below. The minimum text height for the "D" size sheet is 1/8in plotted and 3/32in plotted for the "B" size sheet. All as-built modification layers are to be ***CYAN*** in, including all annotations, dimensions, leaders and callouts.

Entities discovered during construction but not represented on the original construction drawings shall be assigned to layers as described below. This information shall be added to the drawing in such a way not to obscure any original drawing entity when plotted.

Level/layer Management:

All drawing entities shall be grouped together by layer. Drawing entities shall be assigned to layers by discipline code for that entity, see table page D4. This includes non-text entities such as strikeouts, lines, circles, symbols, etc. See Table-1 for typical layer-naming.

Table-1



Identify entities by discipline. For instance: the example below shows layering configuration for all architectural as-built entities ***EXCLUDING TEXT*** that deviate from the original design:

Z-ARCH.

Annotations, dimensions, leaders and callouts for those architectural entities shall be assigned to layer:

Z-ARCH-TEXT.

All annotations shall be assigned to layers by discipline and designated as ***TEXT***.

Each layer name will follow the discipline code for that entity. See Table-2 for Discipline Descriptions:

Table-2

Discipline Code:	***Discipline:***	***Description:***
ARCH	Architectural	Architectural design, building's interior/exterior, walls, doors, windows etc.
CIVIL	Civil	Site work, external to buildings and structures. Typically surface work.
ELEC	Electrical	Electrical work pertaining to buildings/structures internal/external and distribution.
FP	Fire Protection	Fire Protection systems pertaining to buildings/structures internal/external
GEN	General	Typically drawing information, general notes, symbols, etc....
MECH	Mechanical	Mechanical work, HVAC components, compressed air, etc. pertaining to buildings/structures internal/external
PLUMB	Plumbing	Plumbing, piping and fixtures, etc.. pertaining to buildings/structures internal/external
UTIL	Utilities	Utility distribution systems, duct work, manholes and piping/cabling underground/direct buried
STRUC	Structural	All structural work, building framing, conc. duct reinforcement, misc. steel work, etc.
TELE	Telecommunications	Phone lines, cable TV, computer data lines, etc. pertaining to buildings/structures internal/external

Electronic Deliverables:

Submit all as-built documentation and drawing files to the Contracting Officer via recordable CD in the file formats discussed in this and other sections. Electronic transfer of files via E-mail or other methods is not permitted.

Standards Deviation:

Contact the Contracting Officer if questions arise about these standards or these drawing standards cannot be followed. Otherwise, all drawing files will be returned to the drawing provider for correction at no additional cost to the **PWD-ME.**

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NAVFAC MID-ATLANTIC

Public Works Department
Maine

PORTSMOUTH NAVAL SHIPYARD

CADD STANDARDS

June 2014

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1. CADD STANDARDS

All design documents and deliverables prepared by In-House forces and/or contracted A/E firms including IDIQ, Design Bid-Build and Design-Build process shall conform to the following NAVFAC MIDLANT and PWD-ME CADD standards areas not addressed on this standard shall follow:

- UFC 1-300-09N

U.S. DEPARTMENT OF DEFENSE (DOD) *[UFCs available on* http://dod.wbdg.org/

These are NAVFAC MIDLANT PWD-MAINE specific guidelines that supersede all others for contract documents utilized for execution. Refer to the U.S. National CAD Standard Version 3.0 for any items not covered in this or the referenced NAVFAC UFCs.

1. A. General: (for both Design-Build and Design-Bid-Build)

For drawing templates, pen tables, sample symbology, and instructions on sheet arrangement & procedures, see attached NAVFAC MIDLANT PWD-MAINE; Sheet Border Use and Procedures. Provide *.PDF format of all drawing sheets at each submittal phase. In addition, provide *.PDF and *.DWG format of all drawing sheets at the final design submission. CADD files shall be made available upon request, in addition to the full size, stamped Mylar and half-size hard copies or as directed by the specific contract specifications.

1. B. Design Drawings

Prepare, organize, and present design drawings in accordance with the requirements of UFC 1-300-09N.

All drawings and their associated PDFs will maintain a "PRELIMINARY Not for Construction" stamp across the signature areas of the title block, until the actual final design submittal. The stamp shall be in translucent lettering across the Project Title area of the drawing title block and shall be displayed on layer "G-ANNO-TTLB-PRLM". The "G-ANNO-TTLB-PRLM" shall be off for final submittal.

Design revisions shall be tracked by number and date in the revision block of each drawing sheet during the design process. Design revisions shall be assigned to layer "G-ANNO-TTLB-PRLM" and shall be frozen for final submittal.

1. C. Drafting Conventions

1. C.1. Fonts

The standard text height for a plotted D-size drawing shall be **1/8"** for typical text, and **1/4"** for titles, and **1"** maximum for project titles on cover sheets. The standard text height for a plotted B-size drawing shall be **3/32"** for typical text, and **1/8"** for titles, and **1/2"** maximum for project titles on cover sheets. For typical text, use the "**RomanS"** font. For titles, use the "**Swis 721**

BT" font. Both fonts shall have a width ratio of no less than **0.8**.

ROMANS – 1/8" TALL

Swis 721 BT – 1/4" TALL (up to 1")

These are the only fonts that should be used within the drawing area, with one exception: on civil site plans, the Design Manager (EIC/AIC) may use text ("RomanS" font, 1/8" height {Leroy 100}, 0.8 width factor, with an oblique angle of 12 degrees) to annotate existing site features only. Typical (or Normal) text as defined above must be used for all other annotations.

1. C. 2. Symbols

Approved symbology in use by PWD-ME is provided on the PWD-ME title sheet. On the PWD-ME title and standard sheet, borders and plot styles shall delivered at each project design kickoff MTG.

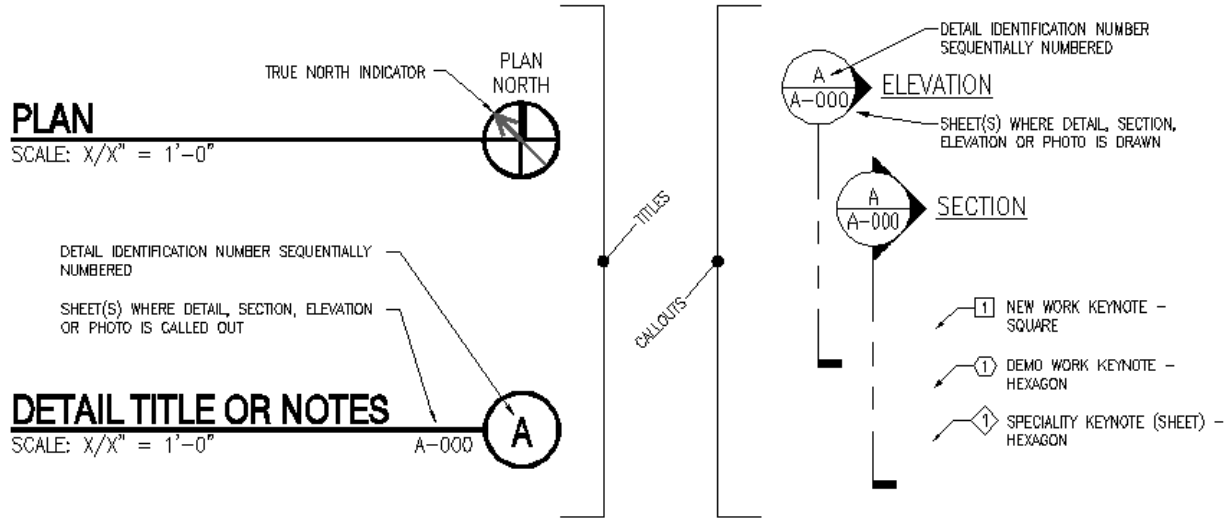

Figure 3-1 PWD-ME Approved Symbols

Note that detail, section, elevation and photograph callouts utilize two-part bubbles which indicate a detail identification number and identify sheet where the detail, section, elevation or photo is shown. Additional sheets(s) on which the detail is called out is (are) displayed to the bottom left of the bubble.

1. C. 3. Line Weights / Pen Tables

NAVFAC's Electronic Documents and Deliverables Working Group (EDDWG) developed a comprehensive pen table that utilized the National Cad Standard 255-pen table as a basis, but added much needed thinner lines and additional grayscales (shaded or screened pens) that had not made the transition from the original US Coast Guard standard. The NAVFAC-specific pen

table is provided as filename **NavFacStnd.ctb**.

The pen tables can be thought of in groups of 20. After pen 19, pens 20 thru 39 are in the "Rust" range when displayed on screen. The first 10 (pens 20 – 29) look "Rust" and print shades of "Rust"; while the second 10 (pens 30 – 39) look "Rust" but print Black. Typically, design drawings for contract documents utilize the pens that print Black (currently colored pens are used for renderings and some other instances, but not normally on contract drawings).

Since these pen tables are established to be legible when printed at full-size (22"x34"), the corresponding text height is 1/8". To be consistent, the related B-size (11"x17") & A-size sheet (8-1/2"x11")—normally used for sketches, uses fonts and line weights that are ½ the size of the large format (D-size) documents—otherwise the fonts are too big and the line weights are too bold. The associated pen table for B-size & A-size documents is **NavFacStnd-Sketch.ctb**

1. D. NAVFAC Logo

A NAVFAC Publications/Logo Guide will be published at a later date, but in the interim, all deliverables shall have the NAVFAC Brand Logo on the title block area of the drawing border (as displayed in the Templates). The logo should not be removed, deleted, or turned off and should appear on all PDFs to be utilized for the electronic bid solicitations. If contract drawings are produced by an A/E firm and that firm desires to have their logo on the drawings then the A/E must apply that logo to all sheets consistently in the same location. Typically that is in the lower- or upper-right hand corner of the drawform, adjacent to the title block.

1. E. Units of Measure

Unless otherwise directed, for all projects the default shall be English units of measurement (U.S. Customary System of units). All drawings, specifications, cost estimates, and design calculations shall reference this system of units.

1. F. Datums and Coordinate Systems

VERTICAL DATUM: All elevations, grades, or profiles shall be represented in U.S. feet and referenced to NAVD88 vertical datum and will be provided as required.

HORIZONTAL DATUM: All Portsmouth Naval Shipyard mapping, utility information, site drawings and surveys are represented in U.S. feet and referenced to the state plane coordinate system, NAD83 Maine west, zone 1802. All electronic mapping and utility information shall be maintained to this system.

1. G. Drawing Numbers/File Naming

In addition to NAVFAC drawings numbers discussed in UFC 1-300-09N, Chapter 4-3, "Drawing Numbers" the Government Project Manager will provide PWD (Public Works Department) Drawing Numbers for each drawing sheet, similar to NAVFAC drawing numbers. The PWD Drawing Number to be requested by the drawing provider at the 100% design stage. The CADD

files shall be named by the PWD drawing number in accordance with the following guidance: The CADD file for each ANSI D (22" x 34") size drawing sheet shall be named by the corresponding PWD Number, minus the design year designator. Where the assigned PWD Number is: 59-08-501 the corresponding CADD file shall be named 059-501.DWG. Where a single drawing file is used to create multiple drawing sheets via layout tabs, the drawing file shall be named by the PWD Number of the first drawing sheet of the drawing set. Drawing sets shall be arranged by discipline.

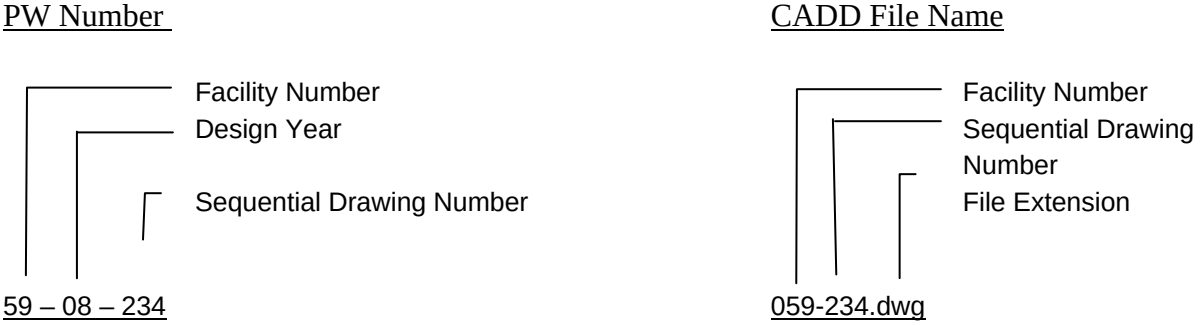

Figure 7-1 DRAWING NUMBERS/FILE NAMING

Files for sketches, drawings other than ANSI D (22" x 34") size shall be named by construction contract number and sheet number of the first sheet of the sheet set.

1. G. 1. File Naming Convention for PDF Files:

ADOBE PDF file naming shall follow CADD file naming methods.

1. H. Electronic Submittals

Submit all CADD files for the final drawings in Autodesk Drawing (*.DWG) compatible with current PWD-ME CADD format. Drawing files shall be full files, uncompressed and unzipped. All submitted CADD files shall maintain their original and complete data structure as produced in their native Autodesk application (i.e. Architectural Desktop, Land Development Desktop, Civil 3D, Building Systems...). All files utilizing AutoCAD's "Xref" feature shall be delivered with all external files "bound" to the drawing file. There shall be no external references in the final drawing file.

Multiple layout tabs are allowed, the tabs shall be annotated by PWD number for each sheet as described in section PWD-ME 7.0 Drawing Numbers/File Naming. The electronic file(s) shall be named by the PWD number of the first sheet of the sheet set. When required, the drawing file shall be split by sheet discipline. Corresponding PDF files shall be grouped into one file and named by the project title.

1. I. Record Documents …1.10.1 Record Drawings (As-Built drawings, G)

The Quality Control Manager shall deliver the marked-up As-Built drawings to the Contractor's Designer of Record who shall incorporate all as-built modifications.

The as-built modifications shall be accomplished by electronic drafting methods on the original CADD (*.DWG) design drawing files to create a complete set of record drawings. For each Record drawing, provide a CADD drawing identical to signed [A/E- or] 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 CADD (*.DWG) drawings. The Record electronic files shall use the file name of the original signed CADD drawing file name with the suffix "-RD" before the file extension, ".DWG" (example; 059-501-RD.dwg – see Drawing File Naming). The original design, RFP, reference, or definitive drawings are not required for inclusion in the Record set of drawings.

After all as-built conditions are recorded on the CADD (*.DWG) files, produce a PDF file of each individual record drawing in conformance with UFC 1-300-09N. Generate PDF drawing files using a PDF page size that corresponds to the original document sheet size (NAVFAC utilizes an ANSI D-size, 22"x34" frame and a 0" border all around) and a PDF print resolution that results in clear detail of all drawing features.

Provide one set of signed and stamped record drawings, plotted on Mylar that fully represent the PDF file. Provide all project final submittals including as-builts in accordance with UFC 1-300-09N Chapter 7-5.2. Each CD-ROM shall be marked with Project Name, Construction Contract Number, Project Number, Specification Number, and Record Drawing date.

1. I. 1. Source Documents

In addition to the drawings provide the specifications, design analysis, reports, survey data, calculations, and any other contract documents utilized in creating the design package (drawings, specifications, and cost estimate) on the CD-ROM disk(s) as specified in preceding paragraph.

1. J. Forwarding Submittals

The [A/E- or] Contractor shall provide all submittals, that lend themselves to paper format (i.e. 8-1/2"x11" documents, 11"x17" or tabloid sheets, or 22"x34" drawings), in electronic *.PDF (Portable Document Format) to the Contracting Officer. The appropriate forwarding e-mail address(es) will be provided at the Pre-Construction meeting. Provision of electronic submittals with appropriate electronic transmittal may alleviate some of the paper copies required herein but must be verified at Pre-Construction meeting. In such instances a minimum of one hard copy shall be forwarded to the Contracting Officer.

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA
08/15, CHG 1: 11/20

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) Standard Guide for 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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

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.

Coordinate the work of this Section with Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI).

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 or 4 for commissioned items without a specified data package requirement in the individual technical Sections. Provide a Data Package 3 or 4 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 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.

1.4.1 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.

1.4.2 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/eProjects 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

1.5 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.

1.5.1 Operating Instructions

Provide specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.5.1.1 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 26.00 22 GOVERNMENTAL SAFETY REQUIREMENTS (PWD ME). Provide recommended safeguards for each identified hazard.

1.5.1.2 Operator Prestart

Provide procedures required to install, set up, and prepare each system for use.

1.5.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown, and Post-shutdown operating procedures including the control sequence for each procedure.

1.5.1.4 Normal Operations

Provide Control Diagrams with data to explain operation and control of systems and specific equipment. Provide narrative description of Normal Operating Procedures.

1.5.1.5 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.

1.5.1.6 Operator Service Requirements

Provide instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gauge readings.

1.5.1.7 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.

1.5.1.8 Operating Log

Provide forms, sample logs, and instructions for maintaining necessary operating records.

1.5.1.9 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.

1.5.2 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.

1.5.2.1 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.

1.5.2.2 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 trade/craft requirements by type of trade/craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

a. Define the anticipated time required to perform 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.

1.5.2.3 Cleaning Recommendations

Provide environmentally preferable cleaning recommendations in accordance with ASTM E1971.

1.5.3 Repairs

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.

1.5.3.1 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.

1.5.3.2 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.

1.5.3.3 Repair Procedures

Provide instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.5.3.4 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.

1.5.3.5 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.

1.5.3.6 Repair Work-Hours

Provide manufacturer's projection of repair work-hours including requirements by type of trade/craft. Identify, and tabulate separately, repair that requires the equipment manufacturer to complete or to participate.

1.5.4 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:

1.5.4.1 Product Submittal Data

Provide a copy of SD-03 Product Data submittals documented with the required approval.

1.5.4.2 Manufacturer's Instructions

Provide a copy of SD-08 Manufacturer's Instructions submittals documented with the required approval.

1.5.4.3 O&M Submittal Data

Provide a copy of SD-10 Operation and Maintenance Data submittals

documented with the required approval.

1.5.4.4 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.

1.5.4.5 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 components of the system. Provide copies of warranties required by Section 01 78 00.00 22 CLOSEOUT SUBMITTALS (PWD ME).

1.5.4.6 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 00.00 22 CLOSEOUT SUBMITTALS (PWD ME).

1.5.4.7 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.

1.5.4.8 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.

1.5.4.9 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.

1.5.4.10 Field Test Reports

Provide a copy of Field Test Reports (SD-06) submittals documented with

the required approval.

1.5.4.11 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.

1.6 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 is as follows:

1.6.1 Data Package 1

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

1.6.2 Data Package 2

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

1.6.3 Data Package 3

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

1.6.4 Data Package 4

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. Maintenance and repair procedures

o. Removal and replacement instructions

p. Spare parts and supply list

q. Maintenance and 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

1.6.5 Data Package 5

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 00.00 22 CLOSEOUT SUBMITTALS (PWD ME). Address aspects of the eOMSI Manual, as submitted in Section 01 78 24.00 20 FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI). 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 Manager. 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 Manager 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) and 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 (2) 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 (2) 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 QC Manager in accordance with Section 01 45 00.00 22 QUALITY CONTROL (PWD ME).

-- End of Section --

SECTION 01 78 24.00 20

FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI)
02/15, CHG 2: 11/20

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. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N (2014; with Change 4, 2018) 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-eOMSI Development 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 Construction Schedule in accordance with Section 01 32 16.00 20 SMALL PROJECT CONSTRUCTION PROGRESS SCHEDULES.

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, 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 00.00 22 ADMINISTRATIVE REQUIREMENTS (PWD ME).

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 the 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 the 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. 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 (4) 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 00.00 22 CLOSEOUT SUBMITTALS (PWD ME). Bookmark drawings using the sheet title and sheet number.

Include Record Drawings as part of the Red-Zone specified in Section 01 30 00.00 22 ADMINISTRATIVE REQUIREMENTS (PWD ME).

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 included in Appendix A of 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 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 each of the Mastersystems are accurate. 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 Subsystems verified, resubmit an updated eOMSI FDW, and request a make-up field verification meeting. At the make-up field verification meeting the new Subsystems and their associated required facility asset fields will be field verified; the new Subsystems must be 100% accurate. Any discrepancies discovered must be corrected prior to the 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 03 30 00

CAST-IN-PLACE CONCRETE
05/14

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 CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI 117	(2010; Errata 2011) Specifications for Tolerances for Concrete Construction and Materials and Commentary
ACI 121R	(2008) Guide for Concrete Construction Quality Systems in Conformance with ISO 9001
ACI 211.1	(1991; R 2009) Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
ACI 301	(2016) Specifications for Structural Concrete
ACI 302.1R	(2015) Guide for Concrete Floor and Slab Construction
ACI 304.2R	(2017) Guide to Placing Concrete by Pumping Methods
ACI 304R	(2000; R 2009) Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI 305R	(2010) Guide to Hot Weather Concreting
ACI 306.1	(1990; R 2002) Standard Specification for Cold Weather Concreting
ACI 306R	(2016) Guide to Cold Weather Concreting
ACI 308.1	(2011) Specification for Curing Concrete
ACI 318	(2014; Errata 1-2 2014; Errata 3-5 2015; Errata 6 2016; Errata 7-9 2017) Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14)
ACI 347R	(2014; Errata 1 2017) Guide to Formwork for Concrete
ACI SP-15	(2011) Field Reference Manual: Standard Specifications for Structural Concrete ACI

	301-05 with Selected ACI References
ACI SP-2	(2007; Abstract: 10th Edition) ACI Manual of Concrete Inspection
ACI SP-66	(2004) ACI Detailing Manual

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4	(1995; R 2004) Basic Hardboard

ASTM INTERNATIONAL (ASTM)

ASTM A1064/A1064M	(2017) Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM A615/A615M	(2016) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A934/A934M	(2016) Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM C1017/C1017M	(2013; E 2015) Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1077	(2017) Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1107/C1107M	(2017) Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C1157/C1157M	(2017) Standard Performance Specification for Hydraulic Cement
ASTM C1260	(2014) Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C143/C143M	(2015) Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150/C150M	(2018) Standard Specification for Portland Cement
ASTM C1602/C1602M	(2012) Standard Specification for Mixing Water Used in Production of Hydraulic Cement Concrete
ASTM C172/C172M	(2017) Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173/C173M	(2016) Standard Test Method for Air

	Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C192/C192M	(2016a) Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM C231/C231M	(2017a) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260/C260M	(2010a; R 2016) Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C295/C295M	(2012) Petrographic Examination of Aggregates for Concrete
ASTM C31/C31M	(2018a) Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C311/C311M	(2017) Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C33/C33M	(2018) Standard Specification for Concrete Aggregates
ASTM C39/C39M	(2018) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C42/C42M	(2018) Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C494/C494M	(2017) Standard Specification for Chemical Admixtures for Concrete
ASTM C595/C595M	(2018) Standard Specification for Blended Hydraulic Cements
ASTM C618	(2017a) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C78/C78M	(2018) Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C920	(2018) Standard Specification for Elastomeric Joint Sealants
ASTM C94/C94M	(2017a) Standard Specification for Ready-Mixed Concrete
ASTM C989/C989M	(2018) Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM D1751	(2004; E 2013; R 2013) Standard

	Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D1752	(2004a; R 2013) Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion
ASTM D5759	(2012) Characterization of Coal Fly Ash and Clean Coal Combustion Fly Ash for Potential Uses
ASTM D6690	(2015) Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM E329	(2018) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

CRSI 10MSP	(2009; 28th Ed; Errata) Manual of Standard Practice

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST PS 1	(2009) DOC Voluntary Product Standard PS 1-07, Structural Plywood

1.2 DEFINITIONS

a. "Cementitious material" as used herein must include all portland cement, pozzolan, fly ash, and ground granulated blast-furnace slag.

b. "Exposed to public view" means situated so that it can be seen from eye level from a public location after completion of the building. A public location is accessible to persons not responsible for operation or maintenance of the building.

c. "Chemical admixtures" are materials in the form of powder or fluids that are added to the concrete to give it certain characteristics not obtainable with plain concrete mixes.

d. "Supplementary cementing materials" (SCM) include coal fly ash, granulated blast-furnace slag, natural or calcined pozzolans, and ultra-fine coal ash when used in such proportions to replace the portland cement that result in improvement to sustainability and durability and reduced cost.

e. "Design strength" (f'c) is the specified compressive strength of concrete at time(s) specified in this section to meet structural design criteria.

f. "Mass Concrete" is any concrete system that approaches a maximum temperature of 158 degrees F within the first 72 hours of placement. In addition, it includes all concrete elements with a section thickness of 3 feet or more regardless of temperature.

g. "Mixture proportioning" is the process of designing concrete mixture proportions to enable it to meet the strength, service life and constructability requirements of the project while minimizing the initial and life-cycle cost.

h. "Mixture proportions" are the masses or volumes of individual ingredients used to make a unit measure (cubic meter or cubic yard) of concrete.

i. "Pozzolan" is a siliceous or siliceous and aluminous material, which in itself possesses little or no cementitious value but will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties.

j. "Workability (or consistence)" is the ability of a fresh (plastic) concrete mix to fill the form/mould properly with the desired work (vibration) and without reducing the concrete's quality. Workability depends on water content, chemical admixtures, aggregate (shape and size distribution), cementitious content and age (level of hydration).

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

Concrete Curing Plan

Quality Control Plan; G

Quality Control Personnel Certifications; G

Quality Control Organizational Chart

Laboratory Accreditation; G

SD-02 Shop Drawings

Reinforcing Steel; G

SD-03 Product Data

Joint Sealants

Joint Filler

Materials for Forms

Cementitious Materials

Concrete Curing Materials

Reinforcement

Admixtures

Mechanical Reinforcing Bar Connectors

Pumping Concrete

SD-05 Design Data

Concrete Mix Design; G

SD-06 Test Reports

Concrete Mix Design; G

Fly Ash

Pozzolan

Ground Granulated Blast-Furnace Slag

Aggregates; G

Compressive Strength Tests; G

Air Content; G

Slump Tests; G

Water; G

SD-07 Certificates

Reinforcing Bars

VOC Content for Form Release Agents, Curing Compounds, and Concrete Penetrating Sealers

Safety Data Sheets

Field Testing Technician and Testing Agency

SD-08 Manufacturer's Instructions

Curing Compound

1.4 MODIFICATION OF REFERENCES

Accomplish work in accordance with ACI publications except as modified herein. Consider the advisory or recommended provisions to be mandatory. Interpret reference to the "Building Official," the "Structural Engineer," and the "Architect/Engineer" to mean the Contracting Officer.

1.5 DELIVERY, STORAGE, AND HANDLING

Follow ACI 301, ACI 304R and ASTM A934/A934M requirements and recommendations. Do not deliver concrete until forms, reinforcement, embedded items, and chamfer strips are in place and ready for concrete placement. Do not store concrete curing compounds or sealers with materials that have a high capacity to adsorb volatile organic compound

(VOC) emissions. Do not store concrete curing compounds or sealers in occupied spaces.

1.5.1 Reinforcement

Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting. Protect from contaminants such as grease, oil, and dirt. Ensure bar sizes can be accurately identified after bundles are broken and tags removed.

1.6 QUALITY ASSURANCE

1.6.1 Design Data

1.6.1.1 Concrete Mix Design

Thirty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete. Submit a complete list of materials including type; brand; source and amount of cement, complementary cementitious materials, and admixtures; and applicable reference specifications. Submit mill test and all other test for cement, complementary cementitious materials, aggregates, and admixtures. Provide documentation of maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve, and a graph of percentage retained verses sieve size. Provide mix proportion data using at least three different water-cementitious material ratios for each type of mixture, which produce a range of strength encompassing those required for each type of concrete required. If source material changes, resubmit mix proportion data using revised source material. Provide only materials that have been proven by trial mix studies to meet the requirements of this specification, unless otherwise approved in writing by the Contracting Officer. Indicate clearly in the submittal where each mix design is used when more than one mix design is submitted. Resubmit data on concrete components if the qualities or source of components changes. For previously approved concrete mix designs used within the past twelve months, the previous mix design may be re-submitted without further trial batch testing if accompanied by material test data conducted within the last six months. Obtain mix design approval from the contracting officer prior to concrete placement.

1.6.2 Shop Drawings

1.6.2.1 Reinforcing Steel

ACI SP-66. Indicate bending diagrams, assembly diagrams, splicing and laps of bars, shapes, dimensions, and details of bar reinforcing, accessories, and concrete cover. Do not scale dimensions from structural drawings to determine lengths of reinforcing bars. Reproductions of contract drawings are unacceptable.

1.6.3 Control Submittals

1.6.3.1 Concrete Curing Plan

Submit proposed materials, methods and duration for curing concrete elements in accordance with ACI 308.1.

1.6.3.2 Pumping Concrete

Submit proposed materials and methods for pumping concrete. Submittal must include mix designs, pumping equipment including type of pump and size and material for pipe, and maximum length and height concrete is to be pumped.

1.6.3.3 VOC Content for Form Release Agents, Curing Compounds, and Concrete Penetrating Sealers

Submit certification for the form release agent, curing compounds, and concrete penetrating sealers that indicate the VOC content of each product.

1.6.3.4 Safety Data Sheets

Submit Safety Data Sheets (SDS) for all materials that are regulated for hazardous health effects. SDS must be readily accessible during each work shift to employees when they are at the construction site.

1.6.4 Test Reports

1.6.4.1 Fly Ash and Pozzolan

Submit test results in accordance with ASTM C618 for fly ash and pozzolan. Submit test results performed within 6 months of submittal date.

1.6.4.2 Ground Granulated Blast-Furnace Slag

Submit test results in accordance with ASTM C989/C989M for ground granulated blast-furnace slag. Submit test results performed within 6 months of submittal date.

1.6.4.3 Aggregates

ASTM C1260 for potential alkali-silica reactions, ASTM C295/C295M for petrographic analysis.

1.6.5 Quality Control Plan

Develop and submit for approval a concrete quality control program in accordance with the guidelines of ACI 121R and as specified herein. The plan must include approved laboratories. Provide direct oversight for the concrete qualification program inclusive of associated sampling and testing. All quality control reports must be provided to the Contracting Officer, Quality Manager and Concrete Supplier. Maintain a copy of ACI SP-15 and CRSI 10MSP at project site.

1.6.6 Quality Control Personnel Certifications

The Contractor must submit for approval the responsibilities of the various quality control personnel, including the names and qualifications of the individuals in those positions and a quality control organizational chart defining the quality control hierarchy and the responsibility of the various positions. Quality control personnel must be employed by the Contractor.

Submit American Concrete Institute certification for the following:

a. CQC personnel responsible for inspection of concrete operations.

b. Lead Foreman or Journeyman of the Concrete Placing, Finishing, and Curing Crews.

c. Field Testing Technicians: ACI Concrete Field Testing Technician, Grade I.

1.6.6.1 Quality Manager Qualifications

Experience on at least five (5) similar projects. Evidence of extraordinary proven experience may be considered by the Contracting Officer as sufficient to act as the Quality Manager.

1.6.6.2 Field Testing Technician and Testing Agency

Submit data on qualifications of proposed testing agency and technicians for approval by the Contracting Officer prior to performing testing on concrete.

a. Work on concrete under this contract must be performed by an ACI Concrete Field Testing Technician Grade 1 qualified in accordance with ACI SP-2 or equivalent. Equivalent certification programs must include requirements for written and performance examinations as stipulated in ACI SP-2.

b. Testing agencies that perform testing services on reinforcing steel must meet the requirements of ASTM E329.

c. Testing agencies that perform testing services on concrete materials must meet the requirements of ASTM C1077.

1.6.7 Laboratory Qualifications for Concrete Qualification Testing

The concrete testing laboratory must have the necessary equipment and experience to accomplish required testing. The laboratory must meet the requirements of ASTM C1077 and be Cement and Concrete Reference Laboratory (CCRL) inspected.

1.6.8 Laboratory Accreditation

Laboratory and testing facilities must be provided by and at the expense of the Contractor. The laboratories performing the tests must be accredited in accordance with ASTM C1077, including ASTM C78/C78M and ASTM C1260. The accreditation must be current and must include the required test methods, as specified.

a. Contractor Quality Control: All sampling and testing must be performed by an approved, onsite, independent, accredited laboratory.

PART 2 PRODUCTS

2.1 MATERIALS FOR FORMS

Provide wood, plywood, plastic, carton, or steel. Use plywood or steel forms where a smooth form finish is required.

2.1.1 Wood Forms

Provide lumber that is square edged or tongue-and-groove boards, free of

raised grain, knotholes, or other surface defects. Provide plywood that complies with NIST PS 1, B-B concrete form panels or better or AHA A135.4, hardboard for smooth form lining.

2.1.1.1 Concrete Form Plywood (Standard Rough)

Provide plywood that conforms to NIST PS 1, B-B, concrete form, not less than 5/8-inch thick.

2.1.1.2 Overlaid Concrete Form Plywood (Standard Smooth)

Provide plywood that conforms to NIST PS 1, B-B, high density form overlay, not less than 5/8-inch thick.

2.1.2 Steel Forms

Provide steel form surfaces that do not contain irregularities, dents, or sags.

2.2 FORM TIES AND ACCESSORIES

Provide a form tie system that does not leave mild steel after break-off or removal any closer than 2 inches from the exposed surface. Do not use wire alone. Form ties and accessories must not reduce the effective cover of the reinforcement.

2.3 CONCRETE MIX DESIGN

2.3.1 Contractor-Furnished Mix Design

ACI 211.1, ACI 301, and ACI 318 ACI 304.2R except as otherwise specified. Indicate the compressive strength (f'c) of the concrete for each portion of the structure(s) as specified below. Where faster set time is required, use Type III cement before using calcium chloride with approval from the contracting officer.

2.3.1.1 Concrete for Concrete Encased Utilities

Proportion normal-weight concrete mixture as follows:

a. Minimum Compressive Strength: 3000 psi at 28 days.

b. Maximum Water-Cementitious Materials Ratio: 0.50.

c. Slump Limit: 5 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.

d. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 3/4 inch nominal maximum aggregate size.

2.3.1.2 Concrete for Cast-in-Place Structures

Proportion normal-weight concrete mixture as follows:

a. Minimum Compressive Strength: 4000 psi at 28 days.

b. Maximum Water-Cementitious Materials Ratio: 0.45.

c. Slump Limit: 5 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.

d. Air Content: 3 percent, plus or minus 1.5 percent at point of delivery for 3/4 inch nominal maximum aggregate size.

2.3.1.3 Mix Proportions for Normal Weight Concrete

Trial design batches, mixture proportioning studies, and testing requirements for various classes and types of concrete specified are the responsibility of the Contractor. Base mixture proportions on compressive strength as determined by test specimens fabricated in accordance with ASTM C192/C192M and tested in accordance with ASTM C39/C39M. Samples of all materials used in mixture proportioning studies must be representative of those proposed for use in the project and must be accompanied by the manufacturer's or producer's test report indicating compliance with these specifications. Base trial mixtures having proportions, consistencies, and air content suitable for the work on methodology described in ACI 211.1. In the trial mixture, use at least three different water-cementitious material ratios for each type of mixture, which must produce a range of strength encompassing those required for each class and type of concrete required on the project. The maximum water-cementitious material ratio allowed must be based on equivalent water-cementitious material ratio calculations as determined by the conversion from the weight ratio of water to cement plus pozzolan by weight equivalency method. Design laboratory trial mixture for maximum permitted slump and air content. Each combination of material proposed for use must have separate trial mixture, except for accelerator or retarder use can be provided without separate trial mixture. Report the temperature of concrete in each trial batch. For each water-cementitious material ratio, at least three test cylinders for each test age must be made and cured in accordance with ASTM C192/C192M and tested in accordance with ASTM C39/C39M for 7 and 28 days. From these results, plot a curve showing the relationship between water-cementitious material ratio and strength for each set of trial mix studies. In addition, plot a curve showing the relationship between 7 and 28 day strengths.

2.3.1.4 Required Average Strength of Mix Design

The selected mixture must produce an average compressive strength exceeding the specified strength by the amount indicated in ACI 301, but may not exceed the specified strength at the same age by more than 20 percent. When a concrete production facility has a record of at least 15 consecutive tests, the standard deviation must be calculated and the required average compressive strength must be determined in accordance with ACI 301.

2.3.2 Ready-Mix Concrete

Provide concrete that meets the requirements of ASTM C94/C94M.

Ready-mixed concrete manufacturer must provide duplicate delivery tickets with each load of concrete delivered. Provide delivery tickets with the following information in addition to that required by ASTM C94/C94M:

Type and brand cement

Cement and complementary cementitious materials content in 94-pound

bags per cubic yard of concrete

Maximum size of aggregate

Amount and brand name of admixtures

Total water content expressed by water cementitious material ratio

2.3.3 Concrete Curing Materials

Provide concrete curing material in accordance with ACI 301 Section 5 and ACI 308.1 Section 2. Submit product data for concrete curing compounds. Submit manufactures instructions for placement of curing compound.

2.4 MATERIALS

2.4.1 Cementitious Materials

For exposed concrete, use one manufacturer and one source for each type of cement, ground slag, fly ash, and pozzolan.

2.4.1.1 Fly Ash

ASTM C618, Class F, except that the maximum allowable loss on ignition must not exceed 3 percent. Class F fly ash for use in mitigating Alkali-Silica Reactivity must have a Calcium Oxide (CaO) content of less than 8 percent and a total equivalent alkali content less than 1.5 percent.

Add with cement. Fly ash content must be a minimum of 15 percent by weight of cementitious material, provided the fly ash does not reduce the amount of cement in the concrete mix below the minimum requirements of local building codes. Where the use of fly ash cannot meet the minimum level, provide the maximum amount of fly ash permittable that meets the code requirements for cement content. Report the chemical analysis of the fly ash in accordance with ASTM C311/C311M. Evaluate and classify fly ash in accordance with ASTM D5759.

2.4.1.2 Raw or Calcined Natural Pozzolan

Natural pozzolan must be raw or calcined and conform to ASTM C618, Class N, including the optional requirements for uniformity and effectiveness in controlling Alkali-Silica reaction and must have an ignition loss not exceeding 3 percent. Class N pozzolan for use in mitigating Alkali-Silica Reactivity must have a Calcium Oxide (CaO) content of less than 13 percent and total equivalent alkali content less than 3 percent.

2.4.1.3 Ultra Fine Fly Ash and Ultra Fine Pozzolan

Ultra Fine Fly Ash (UFFA) and Ultra Fine Pozzolan (UFP) must conform to ASTM C618, Class F or N, and the following additional requirements:

a. The strength activity index at 28 days of age must be at least 95 percent of the control specimens.

b. The average particle size must not exceed 6 microns.

c. The sum of SiO_2 + Al_2O_3 + Fe_2O_3 must be greater than 77 percent.

2.4.1.4 Ground Granulated Blast-Furnace Slag

ASTM C989/C989M, Grade 100. Slag content must be a minimum of 25 percent by weight of cementitious material.

2.4.1.5 Portland Cement

Provide cement that conforms to ASTM C150/C150M, Type I or III, with tri-calcium aluminates (C3A) content less than 10 percent and a maximum cement-alkali content of 0.80 percent Na2Oe (sodium oxide) equivalent. Use one brand and type of cement for formed concrete having exposed-to-view finished surfaces.

2.4.1.6 Blended Cements

Blended cement must conform to ASTM C595/C595M and ASTM C1157/C1157M, Type IP or IS, including the optional requirement for mortar expansion and consist of a mixture of ASTM C150/C150M Type I, or Type II cement and a complementary cementing material. The slag added to the Type IS blend must be ASTM C989/C989M ground granulated blast-furnace slag. The pozzolan added to the Type IP blend must be ASTM C618 Class F and must be interground with the cement clinker. The manufacturer must state in writing that the amount of pozzolan in the finished cement will not vary more than plus or minus 5 mass percent of the finished cement from lot-to-lot or within a lot. The percentage and type of mineral admixture used in the blend must not change from that submitted for the aggregate evaluation and mixture proportioning.

2.4.2 Water

Water must comply with the requirements of ASTM C1602/C1602M. Minimize the amount of water in the mix. Improve workability by adjusting the grading rather than by adding water. Water must be free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances deleterious to concrete. Submit test report showing water complies with ASTM C1602/C1602M.

2.4.3 Aggregates

ASTM C33/C33M, except as modified herein. Furnish aggregates for exposed concrete surfaces from one source. Provide aggregates that do not contain any substance which may be deleteriously reactive with the alkalies in the cement. Submit test report showing compliance with ASTM C33/C33M.

2.4.4 Nonshrink Grout

ASTM C1107/C1107M.

2.4.5 Admixtures

ASTM C494/C494M: Type A, water reducing; Type B, retarding; Type C, accelerating; Type D, water-reducing and retarding; and Type E, water-reducing and accelerating admixture. Do not use calcium chloride admixtures. Submit product data for admixtures used in concrete.

2.4.5.1 Air-Entraining

ASTM C260/C260M.

2.4.5.2 High Range Water Reducer (HRWR) (Superplasticizers)

ASTM C494/C494M, Type F and ASTM C1017/C1017M.

2.4.6 Expansion/Contraction Joint Filler

ASTM D1751 or ASTM D1752 Type I or II. Material must be 1/2 inch thick.

2.4.7 Joint Sealants

2.4.7.1 Horizontal Surfaces, 3 Percent Slope, Maximum

ASTM D6690 or ASTM C920, Type M, Class 25, Use T.

2.4.7.2 Vertical Surfaces Greater Than 3 Percent Slope

ASTM C920, Type M, Grade NS, Class 25, Use T NT.

2.4.8 Biodegradable Form Release Agent

Provide form release agent that is colorless, biodegradable, water-based, with a low (maximum of 55 grams/liter (g/l)) VOC content. Provide product that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces. Provide form release agent that does not contain diesel fuel, petroleum-based lubricating oils, waxes, or kerosene. Submit documentation indicating type of biobased material in product and biobased content. Indicate relative dollar value of biobased content products to total dollar value of products included in project.

2.5 REINFORCEMENT

2.5.1 Reinforcing Bars

ACI 301 unless otherwise specified. Use deformed steel. ASTM A615/A615M with the bars marked A, Grade 60 Submit mill certificates for reinforcing bars.

2.5.2 Mechanical Reinforcing Bar Connectors

ACI 301. Provide 125 percent minimum yield strength of the reinforcement bar.

2.5.3 Wire

2.5.3.1 Welded Wire Reinforcement

ASTM A1064/A1064M. Wire reinforcement may contain post-consumer or post-industrial recycled content.

2.5.3.2 Steel Wire

Wire must conform to ASTM A1064/A1064M.

2.5.4 Reinforcing Bar Supports

Supports include bolsters, chairs, spacers, and other devices necessary for proper spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place.

Provide wire bar type supports of coated or non-corrodible material conforming to ACI SP-66 and CRSI 10MSP.

Legs of supports in contact with formwork must be hot-dip galvanized, or plastic coated after fabrication, or stainless-steel bar supports.

PART 3 EXECUTION

3.1 EXAMINATION

Do not begin installation until substrates have been properly constructed; verify that substrates are level.

If substrate preparation is the responsibility of another installer, notify Contracting Officer of unsatisfactory preparation before processing.

Check field dimensions before beginning installation. If dimensions vary too much from design dimensions for proper installation, notify Contracting Officer and wait for instructions before beginning installation.

3.2 PREPARATION

Determine quantity of concrete needed and minimize the production of excess concrete. Designate locations or uses for potential excess concrete before the concrete is poured.

3.2.1 General

Surfaces against which concrete is to be placed must be free of debris, loose material, standing water, snow, ice, and other deleterious substances before start of concrete placing.

Remove standing water without washing over freshly deposited concrete. Divert flow of water through side drains provided for such purpose.

3.2.2 Subgrade Under Concrete Encased Utilities

When subgrade material is semiporous and dry, sprinkle subgrade surface with water as required to eliminate suction at the time concrete is deposited, or seal subgrade surface by covering surface with specified vapor retarder. When subgrade material is porous, seal subgrade surface by covering surface with specified vapor retarder.

3.2.3 Subgrade Under Structures

Before construction of slabs on ground, have underground work on pipes and conduits completed and approved.

Previously constructed subgrade or fill must be cleaned of foreign materials.

Finished surface of subgrade or fill under exterior slabs on ground must not be more than 0.02-foot above or 0.10-foot below elevation indicated.

3.2.4 Edge Forms and Screed Strips for Slabs

Set edge forms or bulkheads and intermediate screed strips for slabs to

obtain indicated elevations and contours in finished slab surface and must be strong enough to support vibrating bridge screeds or roller pipe screeds if nature of specified slab finish requires use of such equipment. Align concrete surface to elevation of screed strips by use of strike-off templates or approved compacting-type screeds.

3.2.5 Reinforcement and Other Embedded Items

Secure reinforcement, joint materials, and other embedded materials in position, inspected, and approved before start of concrete placing.

3.3 FORMS

Provide forms, shoring, and scaffolding for concrete placement in accordance with ACI 301 Section 2 and 5 and ACI 347R. Set forms mortar-tight and true to line and grade. Chamfer above grade exposed joints, edges, and external corners of concrete 0.75 inch unless otherwise indicated. Provide formwork with clean-out openings to permit inspection and removal of debris.

3.3.1 Coating

Before concrete placement, coat the contact surfaces of forms with a form release agent.

3.3.2 Reuse

Reuse forms providing the structural integrity of concrete and the aesthetics of exposed concrete are not compromised. Wood forms must not be clogged with paste and must be capable of absorbing high water-cementitious material ratio paste.

3.3.3 Forms for Standard Rough Form Finish

Provide formwork in accordance with ACI 301 Section 5 with a surface finish, SF-1.0, for formed surfaces that are to be concealed by other construction.

3.3.4 Form Ties

Provide ties in accordance with ACI 301 section 2.

3.3.5 Tolerances for Form Construction

Construct formwork to ensure that after removal of forms and prior to patching and finishing of formed surfaces, provide concrete surfaces in accordance with tolerances specified in ACI 301 Section 5 and ACI 117.

3.3.6 Removal of Forms and Supports

After placing concrete, removal of forms must be in accordance with ACI 301 Section 2 except as modified by approved form removal schedule.

3.4 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

ACI 301 and ACI SP-66. Provide bars, welded wire reinforcement, wire ties, supports, and other devices necessary to install and secure reinforcement. Reinforcement must not have rust, scale, oil, grease, clay, or foreign substances that would reduce the bond. Rusting of

reinforcement is a basis of rejection if the effective cross-sectional area or the nominal weight per unit length has been reduced. Remove loose rust prior to placing steel. Tack welding is prohibited.

3.4.1 General

Provide details of reinforcement that are in accordance with ACI 301 and ACI SP-66 and as specified.

3.4.2 Reinforcement Supports

Support reinforcement in accordance with ACI 301 Section 3. Supports for coated or galvanized bars must also be coated with electrically compatible material for a distance of at least 2 inches beyond the point of contact with the bars.

3.4.3 Splicing

As indicated. For splices not indicated ACI 301. Do not splice at points of maximum stress. Overlap welded wire reinforcement the spacing of the cross wires, plus 2 inches.

3.4.4 Future Bonding

Plug exposed, threaded, mechanical reinforcement bar connectors with a greased bolt. Provide bolt threads that match the connector. Countersink the connector in the concrete. Caulk the depression after the bolt is installed.

3.4.5 Setting Miscellaneous Material

Place and secure anchors and bolts, pipe sleeves, conduits, and other such items in position before concrete placement and support against displacement. Plumb anchor bolts and check location and elevation. Temporarily fill voids in sleeves with readily removable material to prevent the entry of concrete.

3.4.6 Fabrication

Shop fabricate reinforcing bars to conform to shapes and dimensions indicated for reinforcement, and as follows:

Provide fabrication tolerances that are in accordance with ACI 318 and ACI SP-66.

Provide hooks and bends that are in accordance with ACI 318 and ACI SP-66.

Reinforcement must be bent cold to shapes as indicated. Bending must be done in the shop. Rebending of a reinforcing bar that has been bent incorrectly is not be permitted. Bending must be in accordance with standard approved practice and by approved machine methods.

Tolerance on nominally square-cut, reinforcing bar ends must be in accordance with ACI SP-66.

Deliver reinforcing bars bundled, tagged, and marked. Tags must be metal with bar size, length, mark, and other information pressed in by machine. Marks must correspond with those used on the placing drawings.

Do not use reinforcement that has any of the following defects:

a. Bar lengths, depths, and bends beyond specified fabrication tolerances

b. Bends or kinks not indicated on drawings or approved shop drawings

c. Bars with reduced cross-section due to rusting or other cause

Replace defective reinforcement with new reinforcement having required shape, form, and cross-section area.

3.4.7 Placing Reinforcement

Place reinforcement in accordance with ACI 301 and ACI SP-66.

For concrete encased utilities and cast-in-place structures and for footing reinforcement, support bars or welded wire reinforcement on precast concrete blocks, spaced at intervals required by size of reinforcement, to keep reinforcement the minimum height specified above the underside of slab or footing.

Provide reinforcement that is supported and secured together to prevent displacement by construction loads or by placing of wet concrete, and as follows:

Provide supports for reinforcing bars that are sufficient in number and have sufficient strength to carry the reinforcement they support, and in accordance with ACI 318, ACI SP-66 and CRSI 10MSP. Do not use supports to support runways for concrete conveying equipment and similar construction loads.

Equip supports on ground and similar surfaces with sand-plates.

Support welded wire reinforcement as required for reinforcing bars.

Secure reinforcements to supports by means of tie wire. Wire must be black, soft iron wire, not less than 16 gage.

Reinforcement must be accurately placed, securely tied at intersections, and held in position during placing of concrete by spacers, chairs, or other approved supports. Point wire-tie ends away from the form. Unless otherwise indicated, numbers, type, and spacing of supports must conform to ACI SP-66.

Bending of reinforcing bars partially embedded in concrete is permitted only as specified in ACI SP-66 and ACI 318.

3.4.8 Spacing of Reinforcing Bars

Spacing must be as indicated. If not indicated, spacing must be in accordance with the ACI 318 and ACI SP-66.

Reinforcing bars may be relocated to avoid interference with other reinforcement, or with conduit, pipe, or other embedded items. If any reinforcing bar is moved a distance exceeding one bar diameter or specified placing tolerance, resulting rearrangement of reinforcement is subject to preapproval by the Contracting Officer.

3.4.9 Concrete Protection for Reinforcement

Concrete protection must be in accordance with the ACI 318 and ACI SP-66.

3.5 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE

ASTM C94/C94M, ACI 301, ACI 302.1R and ACI 304R, except as modified herein. Batching equipment must be such that the concrete ingredients are consistently measured within the following tolerances: 1 percent for cement and water, 2 percent for aggregate, and 3 percent for admixtures. Furnish mandatory batch ticket information for each load of ready mix concrete.

3.5.1 Measuring

Make measurements at intervals as specified in paragraphs SAMPLING and TESTING.

3.5.2 Mixing

ASTM C94/C94M, ACI 301 and ACI 304R. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 84 degrees F. Reduce mixing time and place concrete within 60 minutes if the air temperature is greater than 84 degrees F except as follows: if set retarding admixture is used and slump requirements can be met, limit for placing concrete may remain at 90 minutes. Additional water may be added, provided that both the specified maximum slump and water-cementitious material ratio are not exceeded and the required concrete strength is still met. When additional water is added, an additional 30 revolutions of the mixer at mixing speed is required. If the entrained air content falls below the specified limit, add a sufficient quantity of admixture to bring the entrained air content within the specified limits. Dissolve admixtures in the mixing water and mix in the drum to uniformly distribute the admixture throughout the batch. Do not reconstitute concrete that has begun to solidify.

3.5.3 Transporting

Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete which has segregated in transporting and dispose of as directed.

3.6 PLACING CONCRETE

Place concrete in accordance with ACI 301 Section 5.

3.6.1 Pumping

ACI 304R and ACI 304.2R. Pumping must not result in separation or loss of materials nor cause interruptions sufficient to permit loss of plasticity between successive increments. Loss of slump in pumping equipment must not exceed 2 inches at discharge/placement. Do not convey concrete through pipe made of aluminum or aluminum alloy. Avoid rapid changes in pipe sizes. Limit maximum size of course aggregate to 33 percent of the diameter of the pipe. Limit maximum size of well rounded aggregate to 40 percent of the pipe diameter. Take samples for testing at both the point

of delivery to the pump and at the discharge end.

3.6.2 Cold Weather

ACI 306.1. Do not allow concrete temperature to decrease below 50 degrees F. Obtain approval prior to placing concrete when the ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. Cover concrete and provide sufficient heat to maintain 50 degrees F minimum adjacent to both the formwork and the structure while curing. Limit the rate of cooling to 37 degrees F in any 1 hour and 50 degrees F per 24 hours after heat application.

3.6.3 Hot Weather

Maintain required concrete temperature using Figure 4.2 in ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the use of either liquid membrane curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.

3.6.4 Bonding

Surfaces of set concrete at joints, must be roughened and cleaned of laitance, coatings, loose particles, and foreign matter. Roughen surfaces in a manner that exposes the aggregate uniformly and does not leave laitance, loosened particles of aggregate, nor damaged concrete at the surface.

Obtain bonding of fresh concrete that has set as follows:

At joints between footings and walls or columns, between walls or columns and the beams or slabs they support, and elsewhere unless otherwise specified; roughened and cleaned surface of set concrete must be dampened, but not saturated, immediately prior to placing of fresh concrete.

At joints in exposed-to-view work; at vertical joints in walls; at joints near midpoint of span in girders, beams, supported slabs, other structural members; in work designed to contain liquids; the roughened and cleaned surface of set concrete must be dampened but not saturated and covered with a cement grout coating.

Provide cement grout that consists of equal parts of portland cement and fine aggregate by weight with not more than 6 gallons of water per sack of cement. Apply cement grout with a stiff broom or brush to a minimum thickness of 1/16 inch. Deposit fresh concrete before cement grout has attained its initial set.

3.7 WASTE MANAGEMENT

Provide as specified in the Waste Management Plan and as follows.

3.7.1 Mixing Equipment

Before concrete pours, designate Contractor-owned site meeting environmental standards for cleaning out concrete mixing trucks. Minimize water used to wash equipment.

3.7.2 Hardened, Cured Waste Concrete

Use hardened, cured waste concrete as aggregate in concrete mix if approved by Contracting Officer.

3.7.3 Reinforcing Steel

Collect reinforcing steel and place in designated area for recycling.

3.7.4 Other Waste

Identify concrete manufacturer's or supplier's policy for collection or return of construction waste, unused material, deconstruction waste, and/or packaging material.

3.8 SURFACE FINISHES EXCEPT STRUCTURE FLOOR FINISHES

3.8.1 Defects

Repair surface defects in accordance with ACI 301 Section 5.

3.8.2 Not Against Forms (Top of Walls)

Surfaces not otherwise specified must be finished with wood floats to even surfaces. Finish must match adjacent finishes.

3.8.3 Formed Surfaces

3.8.3.1 Tolerances

ACI 117 and as indicated.

3.8.3.2 As-Cast Rough Form

Provide for surfaces not exposed to public view a surface finish SF-1.0. Patch holes and defects in accordance with ACI 301.

3.9 STRUCTURE FLOOR FINISHES AND MISCELLANEOUS CONSTRUCTION

ACI 301 and ACI 302.1R, unless otherwise specified. Slope floors uniformly to drains where drains are provided. Where straightedge measurements are specified, Contractor must provide straightedge.

3.9.1 Finish

Place, consolidate, and immediately strike off concrete to obtain proper contour, grade, and elevation before bleedwater appears. Permit concrete to attain a set sufficient for floating and supporting the weight of the finisher and equipment. If bleedwater is present prior to floating the

surface, drag the excess water off or remove by absorption with porous materials. Do not use dry cement to absorb bleedwater.

3.9.1.1 Steel Troweled

Use for structure floors. Finish concrete in accordance with ACI 301 Section 5 for a steel troweled finish.

3.10 JOINTS

3.10.1 Construction Joints

Make and locate joints not indicated so as not to impair strength and appearance of the structure, as approved. Joints must be perpendicular to main reinforcement. Reinforcement must be continued and developed across construction joints.

3.11 CURING AND PROTECTION

ACI 301 Section 5, unless otherwise specified. Begin curing immediately following form removal. Avoid damage to concrete from vibration created by blasting, pile driving, movement of equipment in the vicinity, disturbance of formwork or protruding reinforcement, and any other activity resulting in ground vibrations. Protect concrete from injurious action by sun, rain, flowing water, frost, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. Do not use membrane-forming compound on concrete to which other concrete is to be bonded. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period. Allow curing compound/sealer installations to cure prior to the installation of materials that adsorb VOCs.

3.11.1 Requirements for Type III, High-Early-Strength Portland Cement

The curing periods are required to be not less than one-fourth of those specified for portland cement, but in no case less than 72 hours.

3.11.2 Curing Periods

ACI 301 Section 5. Begin curing immediately after placement. Protect concrete from premature drying, excessively hot temperatures, and mechanical injury; and maintain minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing are subject to approval by the Contracting Officer.

3.11.3 Curing Formed Surfaces

Accomplish curing of formed surfaces, including undersurfaces of girders, beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed before end of curing period, accomplish final curing of formed surfaces by any of the curing methods specified above, as applicable.

3.11.4 Curing Unformed Surfaces

Accomplish initial curing of unformed surfaces, such as monolithic slabs, floor topping, and other flat surfaces, by membrane curing.

Unless otherwise specified, accomplish final curing of unformed surfaces by any of curing methods specified, as applicable.

3.11.5 Temperature of Concrete During Curing

When temperature of atmosphere is 41 degrees F and below, maintain temperature of concrete at not less than 55 degrees F throughout concrete curing period or 45 degrees F when the curing period is measured by maturity. When necessary, make arrangements before start of concrete placing for heating, covering, insulation, or housing as required to maintain specified temperature and moisture conditions for concrete during curing period.

When the temperature of atmosphere is 80 degrees F and above or during other climatic conditions which cause too rapid drying of concrete, make arrangements before start of concrete placing for installation of wind breaks, of shading, and for fog spraying, wet sprinkling, or moisture-retaining covering of light color as required to protect concrete during curing period.

Changes in temperature of concrete must be uniform and not exceed 37 degrees F in any 1 hour nor 80 degrees F in any 24-hour period.

3.11.6 Protection from Mechanical Injury

During curing period, protect concrete from damaging mechanical disturbances, particularly load stresses, heavy shock, and excessive vibration and from damage caused by rain or running water.

3.11.7 Protection After Curing

Protect finished concrete surfaces from damage by construction operations.

3.12 FIELD QUALITY CONTROL

3.12.1 Sampling

ASTM C172/C172M. Collect samples of fresh concrete to perform tests specified. ASTM C31/C31M for making test specimens.

3.12.2 Testing

3.12.2.1 Slump Tests

ASTM C143/C143M. Take concrete samples during concrete placement/discharge. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cementitious material ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 20 cubic yards (maximum) of concrete.

3.12.2.2 Temperature Tests

Test the concrete delivered and the concrete in the forms. Perform tests

in hot or cold weather conditions (below 50 degrees F and above 80 degrees F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

3.12.2.3 Compressive Strength Tests

ASTM C39/C39M. Make four 6 inch by 12 inch or 4 inch by 8 inch test cylinders for each set of tests in accordance with ASTM C31/C31M, ASTM C172/C172M and applicable requirements of ACI 305R and ACI 306R. Take precautions to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, two cylinders at 28 days. Take samples for strength tests of each mix design of concrete placed each day not less than once a day, nor less than once for each 100 cubic yards of concrete for the first 500 cubic yards, then every 500 cubic yards thereafter. For the entire project, take no less than five sets of samples and perform strength tests for each mix design of concrete placed. Each strength test result must be the average of two cylinders from the same concrete sample tested at 28 days. Concrete compressive tests must meet the requirements of ACI 318 Section 5.6. Retest locations represented by erratic core strengths. Where retest does not meet concrete compressive strength requirements submit a mitigation or remediation plan for review and approval by the contracting officer. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete.

3.12.2.4 Air Content

ASTM C173/C173M or ASTM C231/C231M for normal weight concrete. Test air-entrained concrete for air content at the same frequency as specified for slump tests.

3.12.2.5 Strength of Concrete Structure

The strength of the concrete structure will be considered to be deficient if any of the following conditions are identified:

Failure to meet compressive strength tests as evaluated

Reinforcement not conforming to requirements specified

Concrete which differs from required dimensions or location in such a manner as to reduce strength

Concrete curing and protection of concrete against extremes of temperature during curing, not conforming to requirements specified

Concrete subjected to damaging mechanical disturbances, particularly load stresses, heavy shock, and excessive vibration

Poor workmanship likely to result in deficient strength

Where the strength of the concrete structure is considered deficient submit a mitigation or remediation plan for review and approval by the contracting officer.

3.12.2.6 Non-Conforming Materials

Factors that indicate that there are non-conforming materials include (but

not limited to) excessive compressive strength, inadequate compressive strength, excessive slump, excessive voids and honeycombing, concrete delivery records that indicate excessive time between mixing and placement, or excessive water was added to the mixture during delivery and placement. Any of these indicators alone are sufficient reason for the Contracting Officer to request additional sampling and testing.

Investigations into non-conforming materials must be conducted at the Contractor's expense. The Contractor must be responsible for the investigation and must make written recommendations to adequately mitigate or remediate the non-conforming material. The Contracting Officer may accept, accept with reduced payment, require mitigation, or require removal and replacement of non-conforming material at no additional cost to the Government.

3.12.2.7 Testing Concrete Structure for Strength

When there is evidence that strength of concrete structure in place does not meet specification requirements or there are non-conforming materials, make cores drilled from hardened concrete for compressive strength determination in accordance with ASTM C42/C42M, and as follows:

Take at least three representative cores from each member or area of concrete-in-place that is considered potentially deficient. Location of cores will be determined by the Contracting Officer.

Test cores after moisture conditioning in accordance with ASTM C42/C42M if concrete they represent is more than superficially wet under service.

Air dry cores, (60 to 80 degrees F with relative humidity less than 60 percent) for 7 days before test and test dry if concrete they represent is dry under service conditions.

Strength of cores from each member or area are considered satisfactory if their average is equal to or greater than 85 percent of the 28-day design compressive strength of the class of concrete.

Fill core holes solid with patching mortar and finished to match adjacent concrete surfaces.

Correct concrete work that is found inadequate by core tests in a manner approved by the Contracting Officer.

3.13 REPAIR, REHABILITATION AND REMOVAL

Before the Contracting Officer accepts the structure the Contractor must inspect the structure for cracks, damage and substandard concrete placements that may adversely affect the service life of the structure. A report documenting these defects must be prepared which includes recommendations for repair, removal or remediation must be submitted to the Contracting Officer for approval before any corrective work is accomplished.

3.13.1 Crack Repair

Prior to final acceptance, all cracks in excess of 0.02 inches wide must be documented and repaired. The proposed method and materials to repair the cracks must be submitted to the Contracting Officer for approval. The

proposal must address the amount of movement expected in the crack due to temperature changes and loading.

3.13.2 Repair of Weak Surfaces

Weak surfaces are defined as mortar-rich, rain-damaged, uncured, or containing exposed voids or deleterious materials. Concrete surfaces with weak surfaces less than 1/4 inch thick must be diamond ground to remove the weak surface. Surfaces containing weak surfaces greater than 1/4 inch thick must be removed and replaced or mitigated in a manner acceptable to the Contracting Officer.

3.13.3 Failure of Quality Assurance Test Results

Proposed mitigation efforts by the Contractor must be approved by the Contracting Officer prior to proceeding.

-- End of Section --

SECTION 31 05 19.13

GEOTEXTILES FOR EARTHWORK
02/21

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 D123	(2015b; R 2017) Standard Terminology Relating to Textiles
ASTM D4354	(2012; R 2020) Sampling of Geosynthetics for Testing
ASTM D4355/D4355M	(2014) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491/D4491M	(2017) Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4632/D4632M	(2015a) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2020) Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4873/D4873M	(2017) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
ASTM D4884/D4884M	(2014a) Strength of Sewn or Thermally Bonded Seams of Geotextiles
ASTM D6241	(2014) Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-2-1601	(1991; 1994 Change 1) Engineering and Design -- Hydraulic Design of Flood Control Channels

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for Contractor Quality Control approval. Submittals not having a "G" or "S"

classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-04 Samples

Geotextiles

SD-03 Product Data

Product Data Sheet; G

SD-06 Test Reports

Geotextiles; G
Site Verification

SD-07 Certificates

Geotextiles
Needle Punched Geotextile

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver only approved geotextile rolls to the project site. Label, ship, store, and handle all geotextile in accordance with ASTM D4873/D4873M. Do not use hooks, tongs, or other sharp instruments for handling geotextile.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 General

Provide geotextiles that are woven and non-woven pervious sheet of plastic yarn as defined by ASTM D123 matching or exceeding the minimum average roll values listed in TABLE 1 to be used as shown by the contract drawings. Strength values indicated in the table are for the weaker principal direction.

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

		Woven	Non-Woven	
PROPERTY	UNITS	ACCEPTABLE VALUES	ACCEPTABLE VALUES	TEST METHOD
GRAB STRENGTH	lb	625MD/525CD	250MD/250CD	ASTM D4632/D4632M
PUNCTURE	lb	1950	700	ASTM D6241
PERMEABILITY	gal/min/ft^2	75	75	ASTM D4491/D4491M
APPARENT OPENING SIZE	U.S. SIEVE	40	100	ASTM D4751

PERMITTIVITY	sec -1	1.0	0.8	ASTM D4491/D4491M
ULTRAVIOLET DEGRADATION	Percent	90 at 500 Hrs	70	ASTM D4355/D4355M

2.1.2 Geotextile Fiber

Use fibers consisting of a long-chain synthetic polymer composed of at least 85 percent by weight of polyolefins, polyesters, or polyamides. Add stabilizers and/or inhibitors to the base polymer, if necessary to make the filaments resistant to deterioration caused by ultraviolet light and heat exposure. Do not add reclaimed or recycled fibers or polymer to the formulation. Form geotextile into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. Finish the edges of the geotextile to prevent the outer fiber from pulling away from the geotextile.

2.1.3 Seams

Sew the seams of the geotextile with thread of a material meeting the chemical requirements given above for geotextile yarn or bond the seams by cementing or by heat. Attach the sheets of geotextile at the factory or another approved location, if necessary, to form sections not less than 5 feet wide. Test seams in accordance with method ASTM D4884/D4884M. Seam strength less than 90 percent of the required grab tensile strength of the unaged geotextile in any principal direction is not permitted.

2.1.4 Securing Pins

Secure the geotextile to the embankment or foundation soil by pins to prevent movement prior to placement of revetment materials. Other appropriate means to prevent movement such as staples, sand bags, and stone could also be used. Insert securing pins through both strips of overlapped geotextile along the line passing through midpoints of the overlap. Remove securing pins as placement of revetment materials are placed to prevent tearing of geotextile or enlarging holes. Maximum spacing between securing pins depends on the steepness of the embankment slope. Provide maximum pins spacing equal to or less than the values listed in TABLE 2. When windy conditions prevail at the construction site, increase the number of pins upon the demand of the Contracting Officer. Anchor terminal ends of the geotextile with key trench or apron at crest, toe of the slope and upstream and downstream limits of installation.

TABLE 2
MAXIMUM SPACING FOR SECURING PINS

EMBANKMENT	SPACING, feet
STEEPER THAN 1V ON 3H	2
1V ON 3H TO 1V ON 4H	3
FLATTER THAN 1V ON 4H	5

2.2 INSPECTIONS, VERIFICATIONS, AND TESTING

2.2.1 Manufacturing and Sampling

Provide geotextiles and factory seams meeting the requirements specified in TABLE 1.

2.2.1.1 Conformance Testing

Perform conformance testing in accordance with the manufacturers approved quality control manual. Submit manufacturer's quality control conformance test results.

2.2.1.2 Factory Sampling

Randomly sample geotextiles in accordance with ASTM D4354 (Procedure Method A). Sample factory seams at the frequency specified in ASTM D4884/D4884M. Provide all samples from the same production lot as will be supplied for the contract, of the full manufactured width of the geotextile by at least 10 feet long, except that samples for seam strength may be a full width sample folded over and the edges stitched for a length of at least 5 feet. Identify samples submitted for testing by manufacturers lot designation.

2.2.1.3 Needle Punched Geotextile

For needle punched geotextile, provide manufacturer certification that the geotextile has been inspected using permanent on-line metal detectors and does not contain any needles.

2.2.1.4 Manufacturer Certification

Upon delivery of the geotextile, submit duplicate copies of the written certificate of compliance signed by a legally authorized official of the manufacturer. State that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll value listed in TABLE 1.

2.2.2 Site Verification and Testing

Collect samples at approved locations upon delivery to the site in accordance with ASTM D4354 (Procedure Method B). Test samples to verify that the geotextile meets the requirements specified in TABLE 1. Identify samples by manufacturers name, type of geotextile, lot number, roll number, and machine direction. Perform testing at an approved laboratory. Submit test results from the lot under review for approval prior to deployment of that lot of geotextile. Immediately rewrap rolls which are sampled in their protective covering.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Prepare surface, on which the geotextile will be placed, to a relatively smooth surface condition in accordance with the applicable portion of this specification and must be free from obstruction, debris, depressions, erosion feature, or vegetation. Remove any irregularities so as to ensure continuous, intimate contact of the geotextile with all the surface. Remove loose material, soft or low density pockets of material; grade

erosion features such as rills and gullies out of the surface before geotextile placement.

3.2 INSTALLATION OF THE GEOTEXTILE

3.2.1 General

Place the geotextile in the manner and at the locations shown. At the time of installation, reject the geotextile if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage.

3.2.2 Placement

Place the geotextile with the long dimension perpendicular to the shoreline and laid smooth and free of tension, stress, folds, wrinkles, or creases. Place the strips to provide a minimum width of 36 inches of overlap for each joint. Adjust the actual length of the geotextile used based on initial installation experience. Temporary pinning of the geotextile to help hold it in place until the stone is placed will be allowed. Remove the temporary pins as the stone is placed to relieve high tensile stress which may occur during placement of material on the geotextile. Design protection of riprap in compliance with EM 1110-2-1601. Perform trimming in such a manner that the geotextile is not damaged in any way.

3.3 PROTECTION

Protect the geotextile at all times during construction from contamination by surface runoff; remove any geotextile so contaminated and replaced with uncontaminated geotextile. Replace any geotextile damaged during its installation or during placement of stone at no cost to the Government. Schedule the work so that the covering of the geotextile with a layer of the specified material is accomplished within 7 calendar days after placement of the geotextile. Failure to comply will require replacement of geotextile. Protect the geotextile from damage prior to and during the placement of riprap or other materials. Before placement of stone or other materials, demonstrate that the placement technique will not cause damage to the geotextile. Do not allow equipment on the unprotected geotextile.

3.4 PLACEMENT OF CUSHIONING MATERIAL

Perform placing of cushioning material in a manner to ensure intimate contact of the geotextile with the prepared surface and with the cushioning material. Do not damage the geotextile, including tear, puncture, or abrasion, during placement. On sloping surfaces place the cushioning material from the bottom of the slopes upward. During placement, the height of the drop of riprap material greater than 12 inches is not permitted. Uncover any geotextile damaged beneath the cushioning material, as necessary, and replaced at no cost to the Government.

3.5 OVERLAPPING AND SEAMING

3.5.1 Overlapping

The overlap of geotextile rolls must be 36 inches. Appropriate measures will be taken to ensure required overlap exists after cushion placement.

3.5.2 Sewn Seams

High strength thread should be used so that seam test conforms to ASTM D4884/D4884M. Provide thread meeting the chemical, ultraviolet, and physical requirements of the geotextile, and provide color different from that of the geotextile. Provide seam strength equal to the strength required for the geotextile in the direction across the seam. Overlapping J-type seams are preferable over prayer-type seams as the overlapping geotextile reduces the chance of openings to occur at the seam. Use double sewing, specially for field seams, to provide a safety factor against undetected missed stitches.

-- End of Section --

SECTION 31 11 00

CLEARING AND GRUBBING
11/18

PART 1 GENERAL

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Roads and Walks

Keep roads and walks free of dirt and debris at all times.

3.1.1.2 Trees, Shrubs, and Existing Facilities

Provide protection in accordance with Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS (AOR). Protect trees/brush and vegetation to be left standing from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

3.1.1.3 Utility Lines

Protect existing utility lines that are indicated to remain from damage. Notify the Contracting Officer immediately of damage to or an encounter with an unknown existing utility line. The Contractor is responsible for the repair of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations. When utility lines which are to be removed are encountered within the area of operations, notify the Contracting Officer in ample time to minimize interruption of the service. Refer to Section 01 30 00 ADMINISTRATIVE REQUIREMENTS (PWD ME) and Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS (AOR) for additional utility protection.

3.2 CLEARING

Clearing consists of the felling, trimming, and cutting of trees/brush into sections and the satisfactory disposal of the trees/brush and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared. Clearing also includes the removal and disposal of structures that obtrude, encroach upon, or otherwise obstruct the work. Cut off flush with or below the original ground surface trees, stumps, roots, brush, and other vegetation in areas to be cleared, except such trees/brush and vegetation as may be indicated or directed to be left standing. Trim dead branches 1-1/2 inches or more in diameter on trees designated to be left standing within the cleared areas and trim all branches to the heights indicated or directed. Neatly cut close to the bole of the tree or main branches, limbs and branches to be trimmed.

3.2.1 Tree Removal

Where indicated or directed, trees/brush and stumps that are designated as trees/brush shall be removed from areas outside those areas designated for clearing and grubbing. This work includes the felling of such trees/brush and the removal of their stumps and roots as specified in paragraph GRUBBING. Dispose of trees/brush as specified in paragraph DISPOSAL OF MATERIALS.

3.2.2 Grubbing

Grubbing consists of the removal and disposal of stumps, roots larger than 2 inches in diameter, and matted roots from the designated grubbing areas. Remove material to be grubbed, together with logs and other organic or metallic debris not suitable for foundation purposes, to a depth of not less than 18 inches below the original surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this contract, such as areas for buildings, and areas to be paved. Fill depressions made by grubbing with suitable material and compact to make the surface conform with the original adjacent surface of the ground.

3.3 DISPOSAL OF MATERIALS

Dispose of excess materials in accordance with the approved solid waste management permit and include those materials in the solid waste management report.

All wood or wood like materials remaining from clearing, prunning or grubbing such as limbs, tree tops, roots, stumps, logs, rotten wood, and other similiar materials shall become the property of the Contractor and disposed of as specified. All non-saleable timber and wood or wood like materials remaining from timber harvesting such as limbs, tree tops, roots, stumps, logs, rotten wood, and other similiar materials shall become the property of the Contractor and disposed as specified.

-- End of Section --

SECTION 31 23 00.00 22 (PWD ME)

EXCAVATION AND FILL

04/2023

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 WATER WORKS ASSOCIATION (AWWA)

AWWA C600	(2010) Installation of Ductile-Iron Water Mains and Their Appurtenances

ASTM INTERNATIONAL (ASTM)

ASTM C 136	(2014) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 33	(2016) Standard Specification for Concrete Aggregates
ASTM D 1140	(2014) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(2015; E 2016) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2700 kN-m/m3)
ASTM D 2321	(2014; E 2014) Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 2487	(2011) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 4318	(2010; E 2014) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 698	(2012; E 2014; E 2015) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

STATE OF MAINE (SHS)

SHS MEDOT	(2014) State of Maine Department of Transportation Standard Specifications, including revisions through award of this contract (See http://www.maine.gov/mdot/publications/)

1.2 DEFINITIONS

1.2.1 Underdrain Backfill

A layer of clean, poorly graded crushed rock, stone, or natural sand or gravel having a high porosity which is placed beneath a building slab with or without a vapor barrier to cut off the capillary flow of pore water to the area immediately below a slab.

1.2.2 Degree of Compaction

Degree of compaction is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557, for general soil types, abbreviated as percent laboratory maximum density.

1.2.3 Hard Materials

Weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.2.4 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1 cubic yard in volume. Removal of hard material will not be considered rock excavation because of intermittent drilling that is performed merely to increase production. SPECIAL NOTE: BLASTING IS NOT PERMITTED.

1.2.5 Non-Hazardous Soils

Non-hazardous soils shall include all soils which, upon generation, do not meet the definition of a hazardous waste as defined by the EPA Hazardous Waste Regulations 40 CFR 260 through 40 CFR 268, 40 CFR 273, and 40 CFR 279 and the State of Maine DEP Hazardous Waste Regulations Chapter 850-855.

1.2.6 Hazardous Soils

Hazardous soils shall include all soils which, upon generation, do meet the definition of a hazardous waste as defined by the EPA Hazardous Waste Regulations 40 CFR 260, 40 CFR 268, 40 CFR 273, and 40 CFR 279 and the State of Maine DEP Hazardous Waste Regulations Chapter 850-855.

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. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Shoring and Sheeting Plan; G

Dewatering Work Plan; G

Excavation and Trenching Plan; G

Excess Soil Disposal & Soil Sampling Plan; G

Submit 15 days prior to starting work.

SD-06 Test Reports

Waste Disposal characterization testing results; G

Dewatering testing results; G

Contractor sampling field log book entry; G

Pervious Granular Fill test; G

Borrow Materials; G

Fill and backfill test; G

Select material test; G

Density tests; G

Moisture Content Tests; G

Submit copies of all laboratory and field test reports within 24 hours of the completion of the test. If applicable, submit unit price item rock quantity surveys at least 24 hours in advance of removal.

1.4 DELIVERY, STORAGE, AND HANDLING

Perform in a manner to prevent contamination or segregation of materials.

1.5 CRITERIA FOR BIDDING

Base bids on the following criteria:

1.5.1 General Criteria

a. Surface elevations shown on drawings are approximate. Contractor shall confirm grades and inverts prior to start of work and ordering of materials.

b. Ground water is expected to be encountered at work areas "G" and "H" at shallow elevations. Ground water elevation is expected to be 3.5' to 6' below grade at Vicker's Corner. The Contractor shall include all costs associated with all dewatering efforts. Failure by the Contractor to plan for groundwater conditions shall not be the basis for any claim nor equitable price or contract time adjustments.

c. Removal of soils and rock beyond the lines and grades indicated will not be grounds for claims for additional payment.

d. Blasting will not be permitted on the site. Contractors means and methods may include hoe ramming or other approved methods. Provide protection of adjacent facilities as necessary during prosecution of work.

1.5.2 Soil Management Criteria

a. The Contractor is responsible for all aspects of soil management from generation to disposal; including, excavation, stockpiling, onsite management, testing, loading, transport, and disposal.

b. Contractor must submit an Excess Soil Disposal & Sampling Plan to the Contracting Officer Representative for PWD ME EV for review and approval.

c. A site specific HASP describing proper HAZWOPER site controls for working with soil and groundwater potentially cotaining PFAS must be implemented for worker protection.

d. Reuse of excavated soil is prohibited.

e. Soil stockpiles must follow MEDEP Erosion and Sediment Control Best Management Practices. Soil stockpiles must be placed on and covered with 6 mil poly sheeting and surrounded with erosion and sediment controls to prevent runoff. Soil stockpiles must remain with limits of existing site. Soil stockpiles must remain covered unless actively worked.

f. Contractor must use an experienced environmental professional for the collection of soil samples for disposal characterization.

g. Contractor must use a laboratory that has Maine state certification and NELAP/NELAC accreditation for all test methods required for soil analysis (see requirements in 1.5.4).

h. Soil stockpiles must not be added to once Contractor sample collection is complete.

j. Contractor must provide Contracting Officer (KO) with all documentation pertaining to the sampling event and results. Documentation includes but is not limited to: analytical results, maps and diagrams, copy of chain of custody and field log entries.

k. Contractor must clearly placard stockpiles with "Pending Characterization" while awaiting Contractor soil characterization test results and either "Non-Hazardous" or "Hazardous" based on those results. Signs must be clearly legible and designed to withstand weathering for the duration of the project.

l. Contractor must not ship any soil without the written approval of

the KO and PWD ME EV.

m. Soil transported off the site must be disposed of at a licensed non-municipal landfill disposal facility, preapproved by KO.

n. The Contractor must provide documentation to the KO that soil removed from the site was disposed of at the approved landfill disposal facility.

1.6 GENERAL SOIL MANAGEMENT REQUIREMENTS

1.6.1 Soil Transported Off Base

Any soil transported off base from the site must be disposed of at a licensed non-municipal landfill disposal facility, which has been preapproved by the KO.

1.6.2 Bulk Materials in Contact With Soil

Bulk materials which are in contact with soil (e.g. - undisturbed bedrock, asphalt, concrete) may be transported off base for disposal or recycling, given there are no suspected hazardous constituents associated with the materials (e.g., PCB paint)and soil is completely removed prior to being loaded for transport(field determination by PWD ME Construction Manager (CM) or Engineering Tech (ET)). Information regarding the destination of these materials must be submitted to the KO.

1.7 SOIL SAMPLING FOR WASTE CHARACTERIZATION

Testing parameters must meet the requirements of the selected landfill disposal facility including the type, number, and frequency of tests. Chemical analysis of the samples must be performed by a laboratory that has Maine state certification and National Environmental Laboratory Accreditation Program (NELAP) accreditation for all test methods required for soil analysis (including PFAS constituents) and a Quality Systems Manual that conforms to the standards of ISO 17025.

1.8 SITE WASTE REMOVAL (SWR) MEETING

A SWR meeting must be held with the COR and PWD ME EV prior to the removal of excavated soil from a project site to ensure all pertinent requirements of this contract have been met.

No transport of soil will be allowed until full concurrence is provided by the KO.

1.9 REQUIREMENTS FOR TRANSPORTING BACKFILL ON BASE

Aggregates containing less than 10% fines (material passing the number 4 sieve) transported to the Installation from off base to be used as backfill do not require testing.

All other backfill materials which do not meet the above conditions must be tested for the following contaminants:

- Total Petroleum Hydrocarbons (TPH) (GC/FID)
- Total 8 RCRA Metals (7060, 7740, etc.)
- Total Volatiles (8260)
- Total Semi-Volatiles (8270)

- Total Pesticides (8081)
- Total Herbicides (8151)
- Total PCB's (8082)
- Ignitability/flash (1010-liquids, 1030-solids)
- Corrosivity/pH (9045)
- Reactive Sulfide (7.3.4.1)

Off base soil must not contain any contaminant concentration which exceeds the most current "Residential Scenario" values listed in Appendix 1 of the MEDEP Remedial Action Guidelines found at https://www.maine.gov/dep/spills/publications/guidance/. TPH concentrations must not exceed 100 mg/kg. If the total concentration of any Toxicity Characteristic Leaching Procedure (TCLP) regulated contaminant listed in 40 CFR 261.24 is greater than or equal to twenty times its regulatory threshold, TCLP analysis will be required. The off base soil must not contain any TCLP concentration which exceeds the current EPA values listed in 40 CFR 261.24, Table 1 Maximum Concentration of Contaminants for Toxicity Characteristic EPA limits.

Representative sampling and testing of the backfill must be conducted at a rate of 1 sample for every 1,000 tons, with a minimum of 1 sample per borrow source. Contractor must use a licensed, Maine state-certified and NELAP accredited laboratory for the chemical analysis. Backfill must not be transported on base until all laboratory test results have been approved by PWD ME EV.

Borrow pits must meet all appropriate state certification guidelines. Written confirmation that the purchased backfill material did not come from a chemically impacted area must be provided by borrow pit supplier. Proof of certification and written confirmation must be provided to the PWD ME EV prior to backfill being brought on base.

NOTE: Should any clean backfill be removed for excess soil disposal, testing is required even if the project profile amount covers the amount being disposed of.

1.10 EXCESS SOIL DISPOSAL & SOIL SAMPLING PLAN

The Contractor shall submit an Excess Soil Disposal & Soil Sampling Plan indicating the licensed facility that will be used for off site disposal of excess non-hazardous soil material. The Excess Soil Disposal & Soil Sampling Plan shall include the following:

1. Introduction - Provide a location and description of the excavation work required to complete the work under the contract. A site plan showing the limits of excavation and planned stockpile locations for soils to be reused and unsuitable or excess soils requiring disposal.

2. Excavation - Provide quantities of excavated materials. Provide an estimated quantity of soils to be reused and soils requiring off site disposal.

3. Pre-Excavation Soil Characterization - To classify the soils that will require disposal, the Contractor shall collect representative soil samples to confirm the material meets the requirements of the contractors selected licensed disposal facility. The soil samples must be sent to a laboratory that has Maine state certification and National Environmental Laboratory Accreditation Program (NELAP) accreditation for all test methods required for soil analysis

(including PFAS constituents) and Quality Systems Manual that conforms to the standards of ISO 17025. The quantity & location of soil samples and laboratory tests shall be based on the disposal facility requirements.

4. Soil Sampling - The Contractor shall provide the analytical sampling requirements based on the licensed facility that will be accepting the soils for disposal. The soil must be tested using a laboratory that has Maine state certification and National Environmental Laboratory Accreditation Program (NELAP) accreditation for all test methods required for soil analysis (including PFAS constituents) and Quality Systems Manual that conforms to the standards of ISO 17025.

5. Stockpiling - Provide description on how the soils must be stockpiled within the limits of work and in accordance with the requirements provided in the plans & contract documents. The location of the proposed stockpile areas shall be shown on a site plan.

6. Transportation off base - Provide a description of how the soils will be transported to the approved disposal facility. The Contractor must provide documentation to the Contracting Officer that soil removed from the site was disposed of at the approved disposal facility.

1.11 QUALITY ASSURANCE

1.11.1 Excavation and Trenching Plan

Provide Manufacturers Tabulated Data for trench boxes and other support systems to be used on the project. See EM 385-1-1, Section 25, Excavation and Trenching for requirements.

1.11.2 Dewatering Work Plan

The Contractor must submit procedures for accomplishing dewatering work to the Contracting Officer for approval. The requirements of the plan is specified in Paragraph entitled DEWATERING herein.

1.11.3 Utilities

Movement of construction machinery and equipment over pipes and utilities, including groundwater monitoring wells, during construction shall be at the Contractor's risk. Perform work adjacent to non-Government utilities as indicated in accordance with procedures outlined by utility company. Excavation made with power-driven equipment is not permitted within three (3) feet of known Government-owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

2.1.1 Satisfactory Materials

Any materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, SP free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and frozen, deleterious, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location.

2.1.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Rock, boulders or stones with a particle diameter greater than one-half the lift thickness at the intended location, asphalt, or concrete materials shall be separated from any excess soils requiring disposal and shall be transported & disposed of by the Contractor. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, and stones larger than 3 inches. The Contracting Officer shall be notified of any contaminated materials.

2.1.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM, GP-GM, GW-GM, SW-SM, SP-SM, and SM shall be identified as cohesionless only when the fines are nonplastic (plasticity index equals zero). Materials classified as GM and SM will be identified as cohesive only when the fines have a plasticity index greater than zero.

2.1.4 Expansive Soils

Soils that have a plasticity index equal to or greater than 20 when tested in accordance with ASTM D 4318.

2.1.5 Backfill and Fill Material

ASTM D 2487, classification GW, GP, GM, SW, SP, SM, with a maximum ASTM D 4318 liquid limit of 35, maximum ASTM D 4318 plasticity index of 12, and a maximum of 25 percent by weight passing ASTM D 1140,No. 200 sieve or meet the SHS MEDOT, Section 703.19 Granular Borrow specification.

2.1.6 Structural Fill Material

Structural fill should be a well-graded sand and gravel mixture free of roots, topsoil, loam, where indicated, organic material, and any other deleterious materials, as well as clods of silt or clay, and meet the following gradation requirements:

Screen or Sieve Size	Percent Passing
6 inches	100
3 inches	70 - 100
No. 4	35 - 70

Screen or Sieve Size	Percent Passing
No. 40	5 - 35
No. 200	0 - 5

2.2 UTILITY BEDDING MATERIAL

Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Backfill to top of pipe shall be compacted to 95 percent of ASTM D 698 maximum density. Plastic piping shall have bedding to spring line of pipe. Provide ASTM D 2321 materials as follows:

a. Class I: Angular,0.25 to 1.5 inches, graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.

b. Class II: Coarse sands and gravels with maximum particle size of 1.5 inches, including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D 2487.

2.3 GRAVEL

Provide as specified in Section 32 11 16 BASE AND SUBBASE COURSES FOR RIGID AND FLEXIBLE PAVING.

2.4 BORROW

Obtain borrow materials required in excess of those furnished from excavations from sources outside of Government property. Borrow materials shall meet SHS MEDOT 703.18

2.5 Topsoil

Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than 1 inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth. Amend topsoil pH range to obtain a pH of 5.5 to 7.

2.6 BURIED WARNING AND IDENTIFICATION TAPE

Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls,3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.

Warning Tape Color Codes

Red: Electric
Yellow: Gas,Oil;Steam,Air,Other Dangerous Materials
Orange: CCTV, Telephone and Other Communications

Warning Tape Color Codes
Purple: Reclaimed Water
Blue: Water Systems
Green: Sewer Systems
White: Proposed Excavation
Pink: Temporary Survey Markings

2.6.1 Warning Tape for Metallic Piping

Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

2.6.2 Detectable Warning Tape for Non-Metallic Piping

Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.7 DETECTION WIRE FOR NON-METALLIC PIPING

Detection wire shall be insulated single strand, solid copper with a minimum of 12 AWG.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Shoring and Sheeting

Provide shoring bracing, cribbing, trench boxes, underpinning, and sheeting where indicated. In addition to Section 25 A and B of EM 385-1-1, the Contractor shall include provisions in the shoring and sheeting plan that will accomplish the following:

a. Prevent undermining of pavements, foundations, utility pipelines, structures, and slabs.

b. Prevent slippage or movement in banks or slopes adjacent to the excavation.

3.1.2 Drainage and Dewatering

Provide for the collection and disposal of surface and subsurface water encountered during construction. Prepare a Dewatering plan that complies with State and Federal regulations, and the requirements specified herein.

3.1.2.1 Drainage

So that construction operations progress successfully, completely drain construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall establish/construct storm drainage

features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, berms swales, and other drainage features and equipment as required to maintain dry soils, prevent erosion and undermining of foundations. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained.

3.1.2.2 Dewatering

a. The majority of the site may experience areas of shallow groundwater. Groundwater in the project area may contain detectable concentrations of PFAS constituents. Dewatering work and other aspects of the project must be planned under the assumption that PFAS constituent-impacted groundwater may be encountered up to the elevation listed in bidding criteria. Any groundwater elevations shown on drawings accompanying the specifications are elevations which existed at the time of subsurface investigations, and are for reference only.

b. The Contractor shall prepare a project specific dewatering plan.

The dewatering plan shall at a minimum address anticipated dewatering discharge volumes, pumping rates required to maintain construction in the dry, demonstrate adequate capacity to treat and dispose the discharge volume, and illustrate on a site plan the location proposed for dewatering discharge treatment systems and disposal locations. The plan must detail sampling detail and frequency and recharege area design. The plan shall describe implementation of construction dewatering practices in accordance with Maine Erosion and Sediment Control Best Management Practices (Maine DEPLW0588, latest edition). At no point shall construction dewatering be discharged to storm sewers.

The contractor shall be responsible for performing pre-construction site inspections and periodic site visits throughout construction to assess site conditions. The contractor shall update the excavation, sheeting and dewatering plans as construction progresses to reflect changing conditions and shall submit an updated plan to the Contracting Officer. The contractor shall submit a written report to the Contractor's Quality Control Manager and Contracting Officer, at least weekly, addressing the performance of the dewatering efforts, the Contractor's adherence to the plan and addressing any present or potential problems and recommendations.

The contractor shall be available to meet with the Contracting Officer at any time throughout the contract duration to review the performance of the dewatering system.

c. The Contractor's dewatering efforts shall control groundwater flowing toward or into excavations to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of the construction. Dewatering Pits, french drains, sumps, ditches or trenches shall not be permitted within

three (3) feet of the foundation of any structure. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. The water level shall be maintained continuously 18" below the working level.

d. The dewaterng system shall include the following:
d1. Water must initially be pumped to Appropriately-sized storage container(s) (frac tanks or similar)
d2. The water must then be pumped through a silt filter and two-stage treatment system with appropriate filter media to reduce the concentration of PFAS constituents to below 20 ng/L prior to recharge. The contractor must sample the water before and after the treatment system with sufficient frequency to demonstrate achievement of the discharge threshold and to determine when the filter media must be changed out (as appropriate). The treated water must be stored until analytical results are received confirming achievement of the discharge threshold.
d3. The water must subsequently be discharged to an appropriately-located, -sized, and -designed recharge area within the bermed area. The location of the recharge area must be selected in conjunction with the Government.

e. All waste associated with the dewatering (sediment from the tank, silt and filters from the silt filters, spent filter material, etc.) must be characterized and properly disposed of.

f. The Contractor shall prepare all appropriate submittals (Dewatering Plan, including sampling detail and frequency, and recharge area design) for Government review and approval.

g. A HASP must be prepared for working with soil and groundwater potentially containing PFAS.

3.1.3 Underground Utilities

The location of the existing utilities shown on the plans are approximate. The Contractor shall physically field verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor shall submit a PWD Maine Dig Safe Utility Request Form and contact Dig Safe (1-888-344-7233). The Contractor shall confirm the location of all existing underground utilities prior to commencing any excavation work.

3.1.4 Machinery and Equipment

Movement of construction machinery and equipment over pipes during construction shall be at the Contractor's risk. Repair, or remove and provide new pipe for existing or newly installed pipe that has been displaced or damaged.

3.2 SURFACE PREPARATION

3.2.1 Clearing and Grubbing

Unless indicated otherwise, remove trees, stumps, logs, shrubs, brush and vegetation and other items that would interfere with construction operations within lines 5 feet outside of each building and structure line. Remove stumps entirely. Grub out matted roots and roots over 2 inches in diameter to at least 18 inches below existing surface.

3.2.2 Stripping

Strip suitable soil from the site where excavation or grading is indicated and stockpile separately from other excavated material. Material unsuitable for use as topsoil shall be wasted, except that material meeting the requirements for backfill may be used for backfilling. Locate topsoil so that the material can be used readily for the finished grading. Where sufficient existing topsoil conforming to the material requirements is not available on site, provide borrow materials suitable for use as topsoil. Protect topsoil and keep in segregated piles until needed.

3.2.3 Unsuitable Material

Remove vegetation, debris, decayed vegetable matter, sod, mulch, and rubbish underneath paved areas or concrete slabs.

3.3 EXCAVATION

3.3.1 General

Excavate to contours, elevations to complete the work indicated on the plans.

Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Excavations below indicated depths and/or limits identified in SHS Section 203, Excavation and Embankment and SHS Section 206, Structural Excavation will not be permitted except to remove unsatisfactory material. Unsatisfactory material encountered below the grades shown shall be classified by Contracting Officer and removed as directed. Refill with backfill or structural fill material, depending on location with respect to structures and compact as required in herein. Unless specified otherwise, refill excavations cut below indicated depth with backfill and compact to minimum 95 percent of ASTM D 1557 maximum density. Satisfactory material removed below the depths indicated, without specific direction of the Contracting Officer, shall be replaced with satisfactory materials to the indicated excavation grade; except as specified for spread footings. Determination of elevations and measurements of approved over depth excavation of unsatisfactory material below grades indicated shall be done under the direction of the Contracting Officer. No extra payment will be made for removal of unsuitable soils and replacement with satisfactory material or select fills as may be directed by the Contracting Officer.

3.3.2 Pipe Trenches

Excavate to the dimension indicated. Grade and shape bottom of trenches to provide uniform support for each section of pipe after pipe bedding placement. Tamp if necessary to provide a firm pipe bed. Recesses shall be excavated to accommodate bells and joints so that pipe will be uniformly supported for the entire length. Rock, where encountered, shall be excavated to a depth of at least 6 inches below the bottom of the pipe. Blasting is not allowed.

3.3.3 Hard Material and Rock Excavation

Remove hard material and rock to elevations indicated in a manner that will leave foundation material in an unshattered and solid condition.

Blasting is not allowed. Roughen level surfaces and cut sloped surfaces into benches for bond with concrete. Protect shale from conditions causing decomposition along joints or cleavage planes and other types of erosion.

3.3.4 Excavated Materials

Satisfactory excavated material required for fill or backfill shall be placed in the proper section of the permanent work required or shall be separately stockpiled if it cannot be readily placed. Satisfactory material in excess of that required for the permanent work and all unsatisfactory material shall be disposed of as specified in herein in "DISPOSITION OF SURPLUS MATERIAL."

3.4 CONTROL OF EXCAVATIONS AND EXCAVATED MATERIALS

All Excavation work shall conform with all applicable OSHA and EM385-1-1 requirements. All excavation activities shall conform with Shipyard requirements. All excavations shall be closed as soon as work within the excavation is complete. Excavated materials shall not be allowed to spread in an uncontrolled manner nor become contaminated with other debris. All excavations shall be properly barricaded with barricades and suitable warning devices in a good state of repair. The Government will not provide barricades for Contractor use. The following controls also apply:

3.4.1 Unnatural Fill Materials/Industrial Debris

Unnatural fill materials/industrial debris is soil containing buried debris from industrial operations. Materials include, but are not limited to, metal, plastic, brick, concrete, wood, containers, glass, and materials with unusual color or odor. Upon discovery of such materials, notify the Contracting Officer, who will arrange for the PWD ME Environmental Division to inspect the materials.

3.4.2 Excavated Materials to be Reused as Backfill

a. Excavated non-hazardous soil materials from excavations which will remain open for LESS THAN TWO WEEKS may remain at the site of excavation.

3.5 SUBGRADE PREPARATION

Unsatisfactory material in surfaces to receive fill or in excavated areas shall be removed and replaced with satisfactory materials as directed by the Contracting Officer. The surface shall be scarified to a depth of 6 inches before the fill is started. Sloped surfaces steeper than 1 vertical to 4 horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When subgrades are less than the specified density, the ground surface shall be broken up to a minimum depth of 6 inches, pulverized, and compacted to the specified density. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches and compacted as specified for the adjacent fill. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the

equipment used. Minimum subgrade density shall be as specified herein.

3.5.1 Proof Rolling

Proof rolling shall be done on an exposed subgrade free of surface water (wet conditions resulting from rainfall) which would promote degradation of an otherwise acceptable subgrade. After stripping, proof roll the existing subgrade of the developable site with six passes of a loaded 10 yard dump truck or a 15 ton, pneumatic-tired roller. Operate the truck or roller in a systematic manner to ensure the number of passes over all areas, and at speeds between2 1/2 to 3 1/2 miles per hour. Notify the Contracting Officer a minimum of 3 days prior to proof rolling. Proof rolling shall be performed in the presence of the Contracting Officer. Rutting or pumping of material shall be undercut as directed by the Contracting Officer and replaced with fill and backfill material.

3.6 FILLING AND BACKFILLING

Fill and backfill to contours, elevations required to complete the work. Compact each lift before placing overlaying lift as specified below.

3.6.1 Backfill and Fill Material Placement

Provide for paved areas and under concrete slabs and tunnels, except where structural fill is provided. Place in 6 inch lifts. Do not place over wet or frozen areas. Place backfill material adjacent to structures as the structural elements are completed and accepted. Place and compact material to avoid loading upon or against adjacent structures.

3.6.2 Structural Fill Placement

Provide under structures not pile supported. Place in 6 inch lifts. Do not place over wet or frozen areas. Backfill adjacent to structures shall be placed as structural elements are completed and accepted. Place and compact material to avoid loading upon or against adjacent structures.

3.6.3 Backfill and Fill Material Placement Over Pipes and at Walls

Backfilling shall not begin until underground utilities systems have been inspected, tested and approved, and the excavation cleaned of trash and debris. Backfill shall be brought to indicated finish grade. Where pipe is coated or wrapped for protection against corrosion, the backfill material up to an elevation 2 feet above sewer lines and 1 foot above other utility lines shall be free from stones larger than 1 inch in any dimension. Heavy equipment for spreading and compacting backfill shall not be operated closer to foundation or retaining walls than a distance equal to the height of backfill above the top of footing; the area remaining shall be compacted in layers not more than 4 inches in compacted thickness with power-driven hand tampers suitable for the material being compacted. Backfill shall be placed carefully around pipes or tanks to avoid damage to coatings, wrappings, or tanks.

3.6.4 Trench Backfilling

Backfill as rapidly as construction, testing, and acceptance of work permits. Place and compact trench backfill in6 inch lifts to top of trench and in 6 inch lifts toone foot over pipe outside structures and paved areas.

3.7 BORROW

Where satisfactory materials are not available in sufficient quantity from required excavations, approved borrow materials shall be obtained as specified herein.

3.8 BURIED WARNING AND IDENTIFICATION TAPE

Provide buried utility lines with utility identification tape. Bury tape 12 inches below finished grade; under pavements and slabs, bury tape 6 inches below top of subgrade.

3.9 BURIED DETECTION WIRE

Bury detection wire directly above non-metallic piping at a distance not to exceed 12 inches above the top of pipe. The wire shall extend continuously and unbroken, from manhole to manhole. The ends of the wire shall terminate inside the manholes at each end of the pipe, with a minimum of 3 feet of wire, coiled, remaining accessible in each manhole. The wire shall remain insulated over it's entire length. The wire shall enter manholes between the top of the corbel and the frame, and extend up through the chimney seal between the frame and the chimney seal. For force mains, the wire shall terminate in the valve pit at the pump station end of the pipe.

3.10 COMPACTION

Determine in-place density of existing subgrade; if required density exists, no compaction of existing subgrade will be required. Density requirements specified herein are for cohesionless materials. When cohesive materials are encountered or used, density requirements may be reduced by 5 percent.

3.10.1 General Site

Compact underneath areas designated for vegetation and areas outside the 5 foot line of the paved area or structure to 90 percent of ASTM D 1557.

3.10.2 Utility Trenches

Compact top 12 inches of subgrades to 95 percent of ASTM D 1557. Compact common fill, fill and backfill material, structural fill material to 95 percent of ASTM D 1557.

3.10.3 Adjacent Area

Compact areas within 5 feet of structures to 95 percent of ASTM D 1557.

3.10.4 Paved Areas

Compact top 12 inches of subgrades to 95 percent of ASTM D 1557. Compact fill and backfill materials to 95 percent of ASTM D 1557.

3.11 FINISH OPERATIONS

3.11.1 Grading

Finish grades as indicated within one-tenth of one foot. Grade areas to drain water away from structures. Maintain areas free of trash and

debris. For existing grades that will remain but which were disturbed by Contractor's operations, grade as directed.

3.11.2 Topsoil and Seed

Scarify existing subgrade. Provide 6 inches of topsoil for newly graded finish earth surfaces and areas disturbed by the Contractor. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to seeding, planting, or proper grading. If there is insufficient on-site topsoil meeting specified requirements for topsoil, provide topsoil required in excess of that available. Seed shall match existing vegetation. Provide seed at 5 pounds per 1000 square feet. Provide granular controlled release fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

10 percent available nitrogen
5 percent available phosphorus

Provide mulch and water to establish an acceptable stand of grass.

3.11.3 Protection of Surfaces

Protect newly backfilled, graded, and topsoiled areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.

3.12 FIELD QUALITY CONTROL

3.12.1 Sampling

Take the number and size of samples required to perform the following tests.

3.12.2 Testing

Perform one of each of the following tests for each material used. Provide additional tests for each source change.

3.12.2.1 Fill and Backfill Material Testing

Test fill and backfill material in accordance with ASTM C 136 for conformance to ASTM D 2487 gradation limits; ASTM D 1140 for material finer than theNo. 200 sieve; ASTM D 4318 for liquid limit and for plastic limit; ASTM D 698 or ASTM D 1557 for moisture density relations, as applicable.

3.12.2.2 Select Material Testing

Test select material in accordance with ASTM C 136 for conformance to ASTM D 2487 gradation limits; ASTM D 1140 for material finer than theNo. 200 sieve; ASTM D 698 or ASTM D 1557 for moisture density relations, as applicable.

3.12.2.3 Pervious Granular Fill Testing

Test pervious granular fill in accordance with ASTM C 136 for conformance to gradation specified in ASTM C 33.

3.12.2.4 Density Tests

Test density in accordance with ASTM D 1556. Perform an ASTM D 1556 density test at the start of the job and as follows:

a. Density testing per the following will be required at the expense of the Contractor.

b. Bedding and backfill in trenches and tank foundations: One test per 50 linear feet in each lift.

c. Other site areas as follows:

Material Type	Location of Material	Test Frequency
Undisturbed native soil	Structures & Foundations	Two random tests in structure footings and two tests on subgrade within structure line.
Fills and backfills	Structures	One test per structure per 2,000 sq. in each lift

-- End of Section --

SECTION 32 01 16.71

COLD MILLING ASPHALT PAVING
02/17

PART 1 GENERAL

1.1 QUALITY ASSURANCE

1.1.1 Grade

Mill pavement such that the finished surface conforms to the lines, grades, and cross sections indicated. The maximum allowable deviation of the finished milled pavement surfaces from the established plan grade line and elevation will be 1/4 inch. The deviations from the plan grade line and elevation will not be permitted in areas of pavements where closer conformance with planned grade and elevation is required for the proper functioning of appurtenant structures involved.

1.1.2 Surface Smoothness

The maximum allowable deviation of the finished surfaces from the testing edge in the transverse or longitudinal direction will be 1/4 inch.

1.1.3 Traffic Control

Provide all necessary traffic controls during milling operations.

1.2 EQUIPMENT, TOOLS, AND MACHINES

Maintain in a satisfactory working condition equipment, tools, and machines used in the performance of the work.

1.2.1 Cold-Milling Machine

Provide a cold-milling machine which is self-propelled, capable of milling the pavement to a specified depth and smoothness and of establishing grade control; with means of controlling transverse slope and dust produced during the pavement milling operation. Machine will have capability of adding water in front of equipment to minimize dust during milling operation. The machine will have the ability to remove the millings or cuttings from the pavement and load them into a truck. The milling machine will not damage any part of the pavement structure that is not to be removed.

1.2.2 Cleaning Equipment

Provide cleaning equipment suitable for removing and cleaning loose material from the pavement surface.

1.2.3 Straightedge

Furnish and maintain at the site, in good condition, one 12 foot straightedge or other suitable device for each milling machine, for testing the finished surface. Make straightedge available for Government use. Use straightedges constructed of aluminum or other lightweight metal, with blades of box or box-girder cross section with flat bottom reinforced

to insure rigidity and accuracy. Use straightedges with handles to facilitate movement on the pavement.

1.3 ENVIRONMENTAL REQUIREMENTS

Do not perform milling when there is accumulation of snow or ice on the pavement surface.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 MILLING OPERATION

A minimum of seven days notice is required, prior to start work, for the Contracting Officer to coordinate the milling operation with other activities at the site. Make sufficient passes so that the designated area is milled to the grades and cross sections indicated. Mill the pavement in depth increments that will not damage the pavement below the designated finished grade. If scabbing occurs, the surface will not meet smoothness requirements. Take steps to modify the process as needed to prevent scabbing from occurring. Repair or replace, as directed, items damaged during milling such as manholes, valve boxes, utility lines, pavement that is torn, cracked, gouged, broken, or undercut. Remove the milled material from the pavement and load into trucks.

3.2 GRADE AND SURFACE-SMOOTHNESS TESTING

3.2.1 Grade-Conformance Tests

Test the finished milled surface of the pavement for conformance with the plan-grade requirements and for acceptance by the Contracting Officer by running lines of levels at intervals of 25 feet longitudinally and 12 feet transversely to determine the elevation of the completed pavement. Correct variations from the designated grade line and elevation in excess of the plan-grade requirements as directed. Skin patching for correcting low areas will not be permitted. Remove and replace the deficient low area. Remove sufficient material to allow at least 2 inches of asphalt concrete to be placed.

3.2.2 Surface-Smoothness Tests

After completion of the final milling, the finished milled surface will be tested by the Government with a straightedge. Other approved devices may be used, provided that when satisfactorily and properly operated, such devices reveal all surface irregularities exceeding the tolerances specified. Correct surface irregularities that depart from the testing edge by more than 1/4 inch. Skin patching for correcting low areas will not be permitted. Remove and replace the deficient low area. Remove sufficient material to allow at least 2 inches of asphalt concrete to be placed.

3.3 REMOVAL OF MILLED MATERIAL

. Transport material that is removed to central plant for hot-mix or cold-mix recycling. Material that is removed will become the property of the Contractor and removed from the site.

-- End of Section --

SECTION 32 01 17.61

SEALING CRACKS IN ASPHALT PAVING
05/17

PART 1 GENERAL

1.1 UNIT PRICES

1.1.1 Measurement

Determine the quantity of each sealing item to be paid for by actual measurement of the number of linear feet of in-place material that has been approved.

1.1.2 Payment

Payment will be made at the contract unit bid prices per linear foot for the sealing items scheduled. Include in the unit bid prices the cost of all labor, materials, and the use of all equipment and tools required to complete the work.

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.

ASTM INTERNATIONAL (ASTM)

ASTM C509	(2006; R 2015) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM D6690	(2015) Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM D789	(2015) Determination of Relative Viscosity and Moisture Content of Polyamide (PA)

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-03 Product Data

Installation of Sealant

SD-04 Samples

Materials; G

SD-06 Test Reports

1.4 QUALITY ASSURANCE

Test the crack sealant and backup material, when required, for conformance with the referenced applicable material specification. Submit reports of all tests. Samples will be retained by the Government for possible future testing, should the materials appear defective during or after application. Furnish samples of materials, in sufficient quantity to be tested upon request. Conformance with the test requirements of the laboratory tests specified will not constitute final acceptance of the materials. Final acceptance will be based on the performance of materials that have been satisfactorily installed.

1.5 DELIVERY, STORAGE, AND HANDLING

Inspect materials delivered to the job site for defects; unload, and store them with a minimum of handling to avoid damage. Provide storage facilities at the job site to protect materials from weather and maintain them at the temperatures recommended by the manufacturer.

1.6 EQUIPMENT, TOOLS, AND MACHINES

Equipment, tools, and machines used in performance of the work are subject to approval by the Contracting Officer. Maintain in a satisfactory working condition at all times.

1.6.1 Routing Equipment

Provide routing equipment which is a self-powered machine operating a power driven tool or bit specifically designed for routing bituminous pavements. Use a bit rotating about a vertical axis at sufficient speed to cut a smooth vertical-walled reservoir in the pavement surface and maintain accurate cutting without damaging the sides or top edges of the reservoir. Provide a router capable of following the trace of the crack without deviation. The use of rotary impact routing devices may be permitted if vertical-sided carbide tipped bits are used.

1.6.2 Sandblasting Equipment

Include in the sandblasting equipment an air compressor, hose, and long-wearing venturi-type nozzle of proper size, shape and opening. Use a nozzle with a maximum opening not exceeding 1/4 inch. Use air compressors that are portable and capable of furnishing not less than 150 cfm and maintaining a line pressure of not less than 90 psi at the nozzle while in use. Demonstrate compressor capability under job conditions before approval. Equip the compressor with traps that will maintain the compressed air free of oil and water. Use nozzle with an adjustable guide that will hold the nozzle aligned with the crack about 1 inch above the pavement surface. Adjust the height, angle of inclination and the size of the nozzle as necessary to secure satisfactory results.

1.6.3 Waterblasting Equipment

Include with the waterblasting equipment a trailer-mounted water tank, pumps, high-pressure hose, wand with safety release cutoff control, nozzle, and auxiliary water resupply equipment. Use water tank and auxiliary resupply equipment with sufficient capacity to permit continuous operations. Use hoses, wands, and nozzles capable of cleaning the crack

faces and the pavement surface on both sides of the crack for a width of at least 1/2 inch beyong the crack. Use pump with a mounted pressure gauge that shows the pressure in psi at which the equipment is operating at all times. Limit the pressure so that the sides of the crack are not damaged during the cleaning operation.

1.6.4 Hand Tools

Hand tools may be used, when approved, for removing defective sealant from cracks and repairing or cleaning the crack faces.

1.6.5 Crack Sealing Equipment

Provide unit applicators, used for heating and installing the hot-poured crack sealant materials, that are mobile and equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the crack to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. Allow the sealant to circulate through the delivery hose and return to the inner kettle when not in use, due to the applicator unit design.

1.7 ENVIRONMENTAL REQUIREMENTS

Apply the materials only when the ambient air temperature and the pavement temperature within the joint wall are at least 50 degrees F and rising. Do not apply sealant if moisture is observed in the crack.

PART 2 PRODUCTS

2.1 SEALANTS

Provide sealants conforming to ASTM D6690, Type II.

2.2 BACKER ROD MATERIALS

Provide backer rod material that is a compressible, nonshrinking, nonstaining, nonabsorptive material and nonreactive with the crack sealant. Use backer rod with a melting point temperature of at least 5 degrees F greater than the maximum pouring temperature of the sealant being used, when tested in accordance with ASTM D789. Use material that has a water absorption of not more than 5 percent by weight when tested in accordance with ASTM C509. Use backer rod material that is 25 percent (plus or minus 5 percent) larger in diameter than the nominal width of the crack.

PART 3 EXECUTION

3.1 PREPARATION OF CRACKS

Immediately before the installation of the crack sealant, thoroughly dry and clean the cracks to remove oxidized pavement, loose aggregate and foreign debris. Prepare cracks as follows:

3.1.1 Cracks

3.1.1.1 Hairline Cracks

Cracks that are less than 1/4 inch wide do not need to be sealed.

3.1.1.2 Small Cracks

Route cracks that are 1/4 to 3/4 inch wide to a nominal width 1/8 inch greater than the existing nominal width and to a depth not less than 3/4 inch, sandblast, waterblast, or wire brush and clean and dry using compressed air.

3.1.1.3 Medium Cracks

Sandblast, Waterblast, or Wire brush cracks that are 3/4 to 2 inches wide to a depth of not less than the crack width and clean and dry using compressed air.

3.1.2 Routing

Perform routing of the cracks using a rotary router with a bit that is at least 1/8 inch wider than the nominal width of the crack to remove all residual old sealant (resealing), oxidized pavement and any loose aggregate in the crack wall to a depth qual to the crack width.

3.1.3 Sawing

Perform sawing of the cracks using a power-driving concrete saw as specified in paragraph EQUIPMENT, TOOLS, AND MACHINES. Stiffen the blade as necessary with suitable dummy (or used) blades or washers. Immediately following the sawing operation, clean the crack opening using a water jet to remove all saw cuttings and debris.

3.1.4 Sandblasting or Waterblasing

Sandblast or Waterblast clean the crack faces and the pavement surfaces extending a minimum of 1/2 inch from the crack edges. Use a multiple-pass technique until the surfaces are free of dust, dirt, old sealant residue, or foreign debris that might prevent the sealant material from bonding to the asphalt pavement. After final cleaning and immediately prior to sealing, blow out the cracks with compressed air and leave them completely free of debris and water. Ensure that sandblasting or waterblasting does not damage the pavement.

3.1.5 Backer Rod Material

When required, use backer rod material in all cracks that otherwise would require excessive sealant. Insert the backer rod material into the lower portion of the crack as shown on the drawings. Place the backer rod so that the top of the backer rod is at least 3/4 inch below the top of the pavement. Ensure that the backer rod material is placed at the specified depth and is not stretched or twisted during installation.

3.1.6 Rate of Progress of Crack Preparation

Limit the stages of crack preparation, which include routing, sandblasting of the crack faces, air pressure cleaning and placing of the backer rod material, to only that linear footage that can be sealed during the same

day.

3.2 PREPARATION OF SEALANT

Do not heat hot-poured sealants in excess of the safe heating temperature recommended by the manufacturer, as shown on the sealant containers. Withdraw and waste sealant that has been overheated or subjected to application temperatures for over 4 hours or that has remained in the applicator at the end of the day's operation.

3.3 INSTALLATION OF SEALANT

Submit manufacturer's instructions 7 days prior to the use of the material on the project. Installation of the material will not be allowed until the instructions are received.

3.3.1 Time of Application

Seal cracks immediately following final cleaning and drying of the crack walls and following the placement of the backer rod material (when required). Place sealant only when cracks are dry. Reclean cracks that cannot be sealed under the conditions specified, or when rain interrupts sealing operations, and allow to dry or dry by machanical means prior to installing the sealant.

3.3.2 Sealing the Crack

Immediately preceding, but not more than 50 feet ahead of the crack sealing operations, perform a final cleaning and drying with compressed air. Fill the cracks from the bottom of reservoir formed by the routing or the top of the backer rod up to 1/4 inch below the pavement surface. Remove excess or spilled sealant from the pavement by approved methods and discard it. Install the sealant in a manner which prevents the formation of voids and entrapped air. Several passes with the applicator wand may be necessary to obtain the specified sealant depth from the pavement surface. Do not use gravity methods or pouring pots to install the sealant material. Do not permit traffic over newly sealed pavement until authorized by the Contracting Officer. Check cracks frequently to ensure that the newly installed sealant is cured to a tack-free condition within 3 hours. Immediately notify the Contracting Officer of the location of any sealant that has not cured to a tack-free condition within 3 hours.

3.4 CRACK SEALANT INSTALLATION TEST SECTION

Prior to the cleaning and sealing of the cracks for the entire project, construct a test section at least 200 feet long using the specified materials and approved equipment to demonstrate the proposed sealing of all cracks of the project. Following the completion of the test section and before any other crack is sealed, inspect the test section to determine that the materials and installation meet the requirements specified. If materials or installation do not meet requirements, remove the materials and reclean and reseal the cracks at no cost to the Government. When the test section meets the requirements, it may be incorporated into the permanent work and paid for at the contract unit price per linear foot for sealing items scheduled. Seal all other cracks in the manner approved and sucessfully completed for sealing the test section.

3.5 CLEANUP

Upon completion of the project, remove unused materials from the site and leave the pavement in a clean condition.

3.6 QUALITY CONTROL PROVISIONS

3.6.1 Crack Cleaning

Provide quality control provisions during the crack cleaning process to correct improper equipment and cleaning techniques that damage the bituminous pavement in any manner. Cleaned cracks must be approved by the Contracting Officer prior to installation of the crack sealant.

3.6.2 Crack Seal Application Equipment

Inspect the application equipment to ensure conformance to temperature requirements and proper installation. Evidences of bubbling, improper installing, and failing to cure or set will cause to suspend operations until causes of the deficiencies are determined and corrected.

3.6.3 Crack Sealant

Inspect the crack sealant for proper cure and set rating, tack free surface, bonding to the bituminous pavement, cohesive separation within the sealant, reversion to liquid, and entrapped air and voids. Remove sealants exhibiting any of these deficiencies, at any time prior to the final acceptance of the project, and replace as specified herein at no additional cost to the Government.

-- End of Section --

SECTION 32 05 33

LANDSCAPE ESTABLISHMENT
08/17

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 D5851	(1995; R 2015) Planning and Implementing a Water Monitoring Program

1.2 DEFINITIONS

1.2.1 Pesticide

Any substance or mixture of substances, including biological control agents, that may prevent, destroy, repel, or mitigate pests and are specifically labeled for use by the U.S. Environmental Protection Agency (EPA). Also, any substance used as a plant regulator, defoliant, disinfectant, or biocide. Examples of pesticides include fumigants, herbicides, insecticides, fungicides, nematicides, molluscicides and rodenticides.

1.2.2 Stand of Turf

95 percent ground cover of the established species.

1.3 RELATED REQUIREMENTS

Section 32 92 19 SEEDING applies to this section for installation of seed requirements, with additions and modifications herein.

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Fertilizer; G

Mulches Topdressing

SD-07 Certificates

Maintenance Inspection Report

SD-10 Operation and Maintenance Data

1.5 DELIVERY, STORAGE AND HANDLING

1.5.1 Delivery

Deliver fertilizer to the site in original containers bearing manufacturer's chemical analysis, name, trade name, or trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer may be furnished in bulk with a certificate indicating the above information.

1.5.2 Storage

1.5.2.1 Fertilizer, Lime, Mulch Storage

Store material in designated areas. Store lime and fertilizer in cool, dry locations away from contaminants.

1.5.3 Handling

Do not drop or dump materials from vehicles.

1.6 MAINTENANCE

Develop a water monitoring program for surface and ground water on the project site in accordance with ASTM D5851 and consistent with the water management program utilized during construction operations.

PART 2 PRODUCTS

2.1 POST-PLANT FERTILIZER

Fertilizer for groundcover, wildflowers, and grasses is not permitted. Apply fertilizer to turf in accordance with soil testing recommendations.

2.1.1 Granular Fertilizer

Organic, granular controlled release fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

10 percent available nitrogen
20 percent available phosphorus
20 percent available potassium

2.2 WATER

Source of water must be approved by the Contracting Officer, and be of suitable quality for irrigation. Use collected storm water when available.

2.3 MULCHES TOPDRESSING

Free from noxious weeds, mold, pesticides, or other deleterious materials.

2.4 PESTICIDES AND HERBICIDES

Pesticides and herbicides are not permitted.

PART 3 EXECUTION

3.1 EXTENT OF WORK

Provide landscape construction maintenance to include mowing,overseeding, fertilizing, watering, and weeding for all newly installed landscape areas, unless indicated otherwise, and at all areas inside or outside the limits of the construction that are disturbed by the Contractor's operations.

3.1.1 Policing

Police all landscaped areas. Policing includes removal of leaves, branches and limbs regardless of length or diameter, dead vegetation, paper, trash, cigarette butts, garbage, rocks or other debris. Collected debris must be promptly removed and disposed of at an approved disposal site.

3.1.2 Drainage System Maintenance

Remove all obstructions from surface and subsurface drain lines to allow water to flow unrestricted in swales, catch basins, and yard drains. Remove grates and clear debris in catch basins. Open drainage channels are to be maintained free of all debris and vegetation at all times. Edges of these channels must be clear of any encroachment by vegetation.

3.2 GROUNDCOVER ESTABLISHMENT PERIOD

Groundcover establishment period will commence on the date that inspection by the Contracting Officer shows that the new turf furnished under this contract has been satisfactorily installed to a 95 percent stand of coverage. The establishment period must continue for a period of 60 days during the growing season.

3.2.1 Frequency of Maintenance

Begin maintenance immediately after turf has been installed fully. Inspect areas once a week during the installation and establishment period and perform needed maintenance promptly.

3.2.2 Promotion of Growth

Maintain groundcover in a manner that promotes proper health, growth, natural color. Turf must have 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, remove excess clippings, eradicate weeds, water, fertilize, overseed, topdress and perform other operations necessary to promote growth, as approved by Contracting Officer and consistent with approved Integrated Pest Management Plan. Remove noxious weeds common to the area from planting areas by mechanical means.

3.2.3 Mowing

3.2.3.1 Turf

Mow turf at a uniform finished height. Mow turfed areas to a minimum average height of 3 inches when average height of grass becomes 4 inches for spring/summer maintenance and to a minimum average height of 3 inches

when the average height of grass reaches 5 inches for fall maintenance. The height of turf is measured from the soil surface. Perform mowing of turf in a manner that prevents scalping, rutting, bruising, uneven and rough cutting. Prior to mowing, all rubbish, debris, trash, leaves, rocks, paper, and limbs or branches on a turf area must be picked up and disposed. Adjacent paved areas must be swept/vacuumed clean.

3.2.4 Post-Fertilizer Application

Apply turf fertilizer in a manner that promotes health, growth, vigor, color and appearance of cultivated turf areas. The method of application, fertilizer type and frequencies must be determined by the laboratory soil analysis results the requirements of the particular turf species. Organic fertilizer must be used. In the event that organic fertilizer is not producing the desired effect, the Contractor must contract the Contracting Officer for approval prior to the use of a synthetic type of fertilizer. Apply fertilizer by approved methods in accordance with the manufacturer's recommendations.

3.2.5 Turf Watering

Perform irrigation in a manner that promotes the health, growth, color and appearance of cultivated vegetation and that complies with all Federal, State, and local water agencies and authorities directives. The Contractor must be responsible to prevent over watering, water run-off, erosion, and ponding due to excessive quantities or rate of application. Abide by state, local or other water conservation regulations or restrictions in force during the establishment period..

3.2.6 Turf Clearance Area

Trees located in turf areas must be maintained with a growth free clearance of 18 inches from the tree trunk base. The use of mechanical weed whips to accomplish the turf growth free bed area is prohibited.

3.2.7 Replanting

Replant in accordance with Section 32 92 19 SEEDING and within specified planting dates areas which do not have a satisfactory stand of turf. Replant areas which do not have a satisfactory stand of grasses.

3.2.8 Final Inspection and Acceptance

Final inspection will be make upon written request from the Contractor at least 10 days prior to the last day of the turf establishment period. Final turf acceptance will be based upon a satisfactory stand of turf. Final acceptance of grass areas will be based upon a stand of 95 percent groundcover of established species.

3.2.9 Unsatisfactory Work

When work is found to not meet design intent and specifications, maintenance period will be extended at no additional cost to the Government until work has been completed, inspected and accepted by Contracting Officer.

3.3 FIELD QUALITY CONTROL

3.3.1 Maintenance Inspection Report

Provide maintenance inspection report to assure that landscape maintenance is being performed in accordance with the specifications and in the best interest of plant growth and survivability. Site observations must be documented at the start of the establishment period, then quarterly following the start, and at the end of establishment period. Submit results of site observation visits to the Contracting Officer within 7 calendar days of each site observation visit.

-- End of Section --

SECTION 32 12 16

HOT-MIX ASPHALT (HMA) FOR ROADS
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 ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 156	(2013; R 2017) Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
AASHTO M 320	(2017) Standard Specification for Performance-Graded Asphalt Binder

ASTM INTERNATIONAL (ASTM)

ASTM D1188	(2015) Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D1461	(2017) Standard Test Method for Moisture or Volatile Distillates in Asphalt Mixtures
ASTM D2041/D2041M	(2011) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2489/D2489M	(2016) Standard Test Method for Estimating Degree of Particle Coating of Asphalt Mixtures
ASTM D2726/D2726M	(2017) Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D3666	(2016) Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4867/D4867M	(2009; R 2014) Effect of Moisture on Asphalt Concrete Paving Mixtures

STATE OF MAINE DEPARTMENT OF TRANSPORTATION (SHS)

SHS-MDOT	State of Maine Department of Transportation, Standard Specifications

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

Testing Agency Qualifications

SD-03 Product Data

Mix Design; G

Material Acceptance; G

Material Batch Ticket; G

SD-06 Test Reports

Pavement Courses

1.3 ENVIRONMENTAL REQUIREMENTS

Do not place the hot-mix asphalt upon a wet or frozen surfaces. Follow all environmental requirements as describe in the MDOT Standard Specfications Division 400.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Perform the work consisting of pavement courses composed of mineral aggregate and asphalt material heated and mixed in a central mixing plant and placed on a prepared course. HMA designed and constructed in accordance with this section shall conform to the lines, grades, thicknesses, and typical cross sections indicated. Construct each course to the depth, section, or elevation required by the drawings and roll, finish, and approve it before the placement of the next course.

2.1.1 Asphalt Mixing Plant

Plants used for the preparation of hot-mix asphalt shall conform to the requirements of AASHTO M 156 with the following changes:

2.1.1.1 Truck Scales

Weigh the asphalt mixture on approved, certified scales at the Contractor's expense. Inspect and seal scales at least annually by an approved calibration laboratory.

2.1.1.2 Testing Facilities

Provide laboratory facilities at the plant for the use of the Government's acceptance testing and the Contractor's quality control testing.

2.1.1.3 Inspection of Plant

Provide the Contracting Officer with access at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant; verifying weights, proportions, and material properties; checking the temperatures maintained in the preparation of the mixtures and for taking samples. Provide assistance as requested, for the Government to procure any desired samples.

2.1.1.4 Storage bins

Use of storage bins for temporary storage of hot-mix asphalt will be permitted as follows:

a. The asphalt mixture may be stored in non-insulated storage bins for a period of time not exceeding 3 hours.

b. The asphalt mixture may be stored in insulated storage bins for a period of time not exceeding 8 hours. The mix drawn from bins shall meet the same requirements as mix loaded directly into trucks.

2.1.2 Hauling Equipment

Provide trucks for hauling hot-mix asphalt having tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Petroleum based products shall not be used as a release agent. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers (tarps) shall be securely fastened.

2.1.3 Asphalt Pavers

Provide asphalt pavers which are self-propelled, with an activated screed, heated as necessary, and capable of spreading and finishing courses of hot-mix asphalt which will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

2.1.3.1 Receiving Hopper

Provide paver with a receiving hopper of sufficient capacity to permit a uniform spreading operation and equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

2.1.3.2 Automatic Grade Controls

Equip the paver with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from either a reference line and/or through a system of mechanical sensors or sensor-directed mechanisms or devices which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent. A transverse slope controller shall not

be used to control grade. Provide controls capable of working in conjunction with any of the following attachments:

a. Ski-type device of not less than 30 feet in length.

b. Taut stringline set to grade.

c. Short ski or shoe for joint matching.

d. Laser control.

2.1.4 Rollers

Rollers shall be in good condition and shall be operated at slow speeds to avoid displacement of the asphalt mixture. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. Do not use equipment which causes excessive crushing of the aggregate.

2.2 AGGREGATES

2.2.1 Aggregate Gradation

Conform to SHS-MDOT Section 401, hot mix asphalt 12.5 mm nominal size (Item 403.208) for wearing course, and 19.5 mm nominal size (Item 403.207) for binder course.

2.3 ASPHALT CEMENT BINDER

Asphalt cement binder shall conform to AASHTO M 320 Performance Grade (PG) 64-28. Test data indicating grade certification shall be provided by the supplier at the time of delivery of each load to the mix plant. Submit copies of these certifications to the Contracting Officer. The supplier is defined as the last source of any modification to the binder.

2.4 MIX DESIGN

The Contractor shall develop the mix design in accordance with SHS-MDOT Section 401. The asphalt mix shall be composed of a mixture of well-graded aggregate, mineral filler if required, and asphalt material. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF). No hot-mix asphalt for payment shall be produced until a JMF has been approved. The hot-mix asphalt shall be designed using procedures contained in AI MS-2 and the criteria outlined in SHS-MDOT Section 401. If the Tensile Strength Ratio (TSR) of the composite mixture, as determined by ASTM D4867/D4867M is less than 75, the aggregates shall be rejected or the asphalt mixture treated with an approved anti-stripping agent. The amount of anti-stripping agent added shall be sufficient to produce a TSR of not less than 75. If an antistrip agent is required, it shall be provided by the Contractor at no additional cost.

2.4.1 JMF Requirements

Submit in writing the job mix formula for approval at least 14 days prior to the start of the test section including as a minimum:

a. Percent passing each sieve size.

b. Percent of asphalt cement.

c. Percent of each aggregate and mineral filler to be used.

d. Asphalt viscosity grade, penetration grade, or performance grade.

e. Number of blows of hand-held hammer per side of molded specimen. (NA for Superpave)

f. Number of gyrations of Superpave gyratory compactor, (NA for Marshall mix design)

g. Laboratory mixing temperature.

h. Lab compaction temperature.

i. Temperature-viscosity relationship of the asphalt cement.

j. Plot of the combined gradation on the 0.45 power gradation chart, stating the nominal maximum size.

k. Graphical plots of stability (NA for Superpave), flow (NA for Superpave), air voids, voids in the mineral aggregate, and unit weight versus asphalt content as shown in AI MS-2.

l. Specific gravity and absorption of each aggregate.

m. Percent natural sand.

n. Percent particles with 2 or more fractured faces (in coarse aggregate).

o. Fine aggregate angularity.

p. Percent flat or elongated particles (in coarse aggregate).

q. Tensile Strength Ratio(TSR).

r. Antistrip agent (if required) and amount.

s. List of all modifiers and amount.

t. Correlation of hand-held hammer with mechanical hammer (NA for Superpave).

u. Percentage and properties (asphalt content, binder properties, and aggregate properties) of reclaimed asphalt pavement (RAP) in accordance with paragraph RECYCLED HOT-MIX ASPHALT, if RAP is used.

2.4.2 Adjustments to Field JMF

Keep the Laboratory JMF for each mixture in effect until a new formula is approved in writing by the Contracting Officer. Should a change in sources of any materials be made, perform a new laboratory jmfJMF design and a new JMF approved before the new material is used. The Contractor will be allowed to adjust the Laboratory JMF within the limits specified below to optimize mix volumetric properties with the approval of the Contracting Officer. Adjustments to the Laboratory JMF shall be applied to the field (plant) established JMF and limited to those values as

shown. Adjustments shall be targeted to produce or nearly produce 4 percent voids total mix (VTM).

TABLE 6. Field (Plant) Established JMF Tolerance

Sieves	Adjustments (plus or minus), percent
1/2	3
No. 4	3
No. 8	3
No. 200	1
Binder Content	0.4

If adjustments are needed that exceed these limits, develop a new mix design. Tolerances given above may permit the aggregate grading to be outside the limits of the MDOT mix criteria; while not desirable, this is acceptable, except for the No. 200 sieve, which shall remain within the aggregate grading of the MDOT mix criteria.

2.5 SOURCE QUALITY CONTROL

Employ a commercial laboratory approved by the Contracting Officer to perform testing. The laboratory used to perform sampling and testing shall meet the requirements of ASTM D3666. Submit Testing Agency Qualifications. A certification signed by the manager of the laboratory stating that it meets these requirements or clearly listing deficiencies shall be submitted to the Contracting Officer prior to the start of construction.

2.6 TACK COAT

Tack coat shall conform to SHS-MDOT Section 409.

PART 3 EXECUTION

3.1 PREPARATION OF ASPHALT BINDER MATERIAL

Heat the asphalt cement material avoiding local overheating and providing a continuous supply of the asphalt material to the mixer at a uniform temperature. The temperature of unmodified asphalts shall be no more than 325 degrees F when added to the aggregates. Performance-Graded (PG) asphalts shall be within the temperature range of 265-320 degrees F when added to the aggregate.

3.2 PREPARATION OF MINERAL AGGREGATE

Heat and dry the aggregate for the mixture prior to mixing. No damage shall occur to the aggregates due to the maximum temperature and rate of heating used. The temperature of the aggregate and mineral filler shall not exceed 350 degrees F when the asphalt cement is added. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

3.3 PREPARATION OF HOT-MIX ASPHALT MIXTURE

The aggregates and the asphalt cement shall be weighed or metered and introduced into the mixer in the amount specified by the JMF. Mix the combined materials until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but no less than 25 seconds for batch plants. Establish the wet mixing time for all plants based on the procedure for determining the percentage of coated particles described in ASTM D2489/D2489M, for each individual plant and for each type of aggregate used. The wet mixing time will be set to at least achieve 95 percent of coated particles. The moisture content of all hot-mix asphalt upon discharge from the plant shall not exceed 0.5 percent by total weight of mixture as measured by ASTM D1461.

3.4 PREPARATION OF THE UNDERLYING SURFACE

Immediately before placing the hot mix asphalt, clean the underlying course of dust and debris. Apply a tack coat in accordance with the contract specifications.

3.5 TRANSPORTING AND PLACING

3.5.1 Transporting

Transport the hot-mix asphalt from the mixing plant to the site in clean, tight vehicles. Schedule deliveries so that placing and compacting of mixture is uniform with minimum stopping and starting of the paver. Provide adequate artificial lighting for night placements. Hauling over freshly placed material will not be permitted until the material has been compacted as specified, and allowed to cool to 140 degrees F. To deliver mix to the paver, use a material transfer vehicle operated to produce continuous forward motion of the paver. Furnish batch ticket information for each load of hot-mix asphalt.

3.5.2 Placing

Place and compact the mix at a temperature suitable for obtaining density, surface smoothness, and other specified requirements. Upon arrival, place the mixture to the full width by an asphalt paver; it shall be struck off in a uniform layer of such depth that, when the work is completed, it will have the required thickness and conform to the grade and contour indicated. Regulate the speed of the paver to eliminate pulling and tearing of the asphalt mat. Unless otherwise permitted, placement of the mixture shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope. Place the mixture in consecutive adjacent strips having a minimum width of 10 feet. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 1 foot; however, the joint in the surface course shall be at the centerline of the pavement. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet. On isolated areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and luted by hand tools.

3.6 COMPACTION OF MIXTURE

After placing, the mixture shall be thoroughly and uniformly compacted by rolling. Compact the surface as soon as possible without causing displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once. Furnish sufficient rollers to handle the volume of material delivered. Continue rolling until the surface is of uniform texture, true to grade and cross section, and the required field density is obtained. To prevent adhesion of the mixture to the roller, keep the wheels properly moistened but excessive water will not be permitted. In areas not accessible to the roller, the mixture shall be thoroughly compacted with hand tampers. Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or is in any way defective shall be removed full depth, replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching will not be allowed.

3.7 JOINTS

The formation of joints shall be performed ensuring a continuous bond between the courses and to obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

3.7.1 Transverse Joints

Do not pass the roller over the unprotected end of the freshly laid mixture, except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing material at the joint. Remove the cutback material from the project. In both methods, all contact surfaces shall be given a light tack coat of asphalt material before placing any fresh mixture against the joint.

3.7.2 Longitudinal Joints

Longitudinal joints which are irregular, damaged, uncompacted, cold (less than 175 degrees F at the time of placing adjacent lanes), or otherwise defective, shall be cut back a maximum of 3 inches from the top of the course with a cutting wheel to expose a clean, sound vertical surface for the full depth of the course. All cutback material shall be removed from the project. All contact surfaces shall be given a light tack coat of asphalt material prior to placing any fresh mixture against the joint. The Contractor will be allowed to use an alternate method if it can be demonstrated that specified density, smoothness, and texture can be met.

3.8 FIELD QUALITY CONTROL

3.8.1 Testing

3.8.1.1 Pavement Courses

Perform the following tests:

a. Temperature: Determine the temperature of each load of bituminous mixture prior to placement and before the load is deposited into the spreading equipment.

b. Density: Determine the representative laboratory density by averaging the density of four laboratory specimens prepared in accordance with ASTM D2041/D2041M. Samples for laboratory specimens shall be taken from trucks delivering mixture to the site; record in a manner approved by the Contracting Officer the project areas represented by the laboratory densities. Determine field density of pavement by averaging densities of 4-inch diameter cores obtained from binder, and wearing courses; take three cores for each course placed. Permit the COR to select the locations of the cores. Fill core holes with wearing corse. Determine density of laboratory prepared specimens and cored samples in accordance with ASTM D1188 or ASTM D2726/D2726M, as applicable. Separate pavement layers by sawing or other approved means.Maximum allowable deficiency at any point, excluding joints, shall not be more than 2 percent less than the specified density for any course. The average density of each course, excluding joints, shall be not less than the specified density. Joint densities shall not be more than 2 percent less than specified course densities and are not included when calculating average course densities. When the deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement and replacing with new pavement.

c. Thickness: Determine thickness of binder and wearing courses from samples taken for the field density test. The maximum allowable deficiency at any point shall not be more than 1/4 inch less than the thickness for the indicated course. Average thickness of course or of combined courses shall be not less than the indicated thickness. Where a deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement and replacing with new pavement.

d. Smoothness: Straightedge test the compacted surface of binder, and wearing courses as work progresses. Apply straightedge parallel with and at right angles to the centerline after final rolling. Unevenness of binder course shall not vary more than 1/4 inch in 10 feet; variations in the wearing course shall not vary more than 1/8 inch in 10 feet. Correct each portion of the pavement showing irregularities greater than that specified.

e. Finished Grades: Finish grades of each course placed shall not vary from the finish elevations, profiles, and cross sections indicated by more than 1/2 inch. Correct deficient paved areas by removing existing work and replacing with new materials that meet the specifications. Skin patching for correcting low areas is prohibited.

f. Finish Surface Texture of Wearing Course: Visually check final surface texture for uniformity and reasonable compactness and

tightness. Final wearing course with a surface texture having undesirable irregularities such as segregation, cavities, pulls or tears, checking, excessive exposure of coarse aggregates, sand streaks, indentations, ripples, or lack of uniformity shall be removed and replaced with new materials.

3.9 PROTECTION

Do not permit vehicular traffic, including heavy equipment, on pavement until surface temperature has cooled to at least 120 degrees F. Measure surface temperature by approved surface thermometers or other satisfactory methods.

3.10 MATERIAL ACCEPTANCE

Testing for acceptability of work will be performed by an independent laboratory hired by the Contractor. Forward test results and payment calculations daily to the Contracting Officer.

-- End of Section --

SECTION 32 17 23

PAVEMENT MARKINGS
08/16

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 ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 247	(2013) Standard Specification for Glass Beads Used in Pavement Markings

ASTM INTERNATIONAL (ASTM)

ASTM D6628	(2003; R 2015) Standard Specification for Color of Pavement Marking Materials

MASTER PAINTERS INSTITUTE (MPI)

MPI 97	(2012) Traffic Marking Paint, Latex

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2015) 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-03 Product Data

Surface Preparation Equipment List; G

Application Equipment List; G

Exterior Surface Preparation

Safety Data Sheets; G

Reflective media for roads; G

Waterborne Paint; G

SD-06 Test Reports

Waterborne Paint; G

SD-07 Certificates

Volatile Organic Compound, (VOC)

SD-08 Manufacturer's Instructions

Waterborne Paint

1.3 QUALITY ASSURANCE

1.3.1 Regulatory Requirements

Submit certificate stating that the proposed pavement marking paint meets the Volatile Organic Compound, (VOC) regulations of the local Air Pollution Control District having jurisdiction over the geographical area in which the project is located. Submit Safety Data Sheets for each product.

1.4 DELIVERY AND STORAGE

Deliver paint materials and reflective media in original sealed containers that plainly show the designated name, specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer.

Provide storage facilities at the job site, only in areas approved by the Contracting Officer, for maintaining materials at temperatures recommended by the manufacturer.

1.5 PROJECT/SITE CONDITIONS

1.5.1 Environmental Requirements

1.5.1.1 Weather Limitations for Application

Apply pavement markings to clean, dry surfaces, and unless otherwise approved, only when the air and pavement surface temperature is at least 5 degrees F above the dew point and the air and pavement temperatures are within the limits recommended by the pavement marking manufacturer. Allow pavement surfaces to dry after water has been used for cleaning or rainfall has occurred prior to striping or marking. Test the pavement surface for moisture before beginning work each day and after cleaning. Do not commence marking until the pavement is sufficiently dry and the pavement condition has been approved by the Contracting Officer. Employ the "plastic wrap method" to test the pavement for moisture as specified in paragraph TESTING FOR MOISTURE.

1.5.1.2 Weather Limitations for Removal of Pavement Markings on Roads and Automotive Parking Areas

Pavement surface must be free of snow, ice, or slush; with a surface temperature of at least 40 degrees F and rising at the beginning of operations. Cease operation during thunderstorms, or during rainfall, except for waterblasting and removal of previously applied chemicals. Cease waterblasting where surface water accumulation alters the effectiveness of material removal.

1.5.2 Traffic Controls

Place warning signs conforming to MUTCD near the beginning of the worksite and well ahead of the worksite for alerting approaching traffic from both directions. Place small markers along newly painted lines or freshly placed raised markers to control traffic and prevent damage to newly painted surfaces or displacement of raised pavement markers. Mark painting equipment with large warning signs indicating slow-moving painting equipment in operation.

When traffic must be rerouted or controlled to accomplish the work, provide necessary warning signs, flag persons, and related equipment for the safe passage of vehicles.

1.5.3 Lighting

When night operations are necessary, provide all necessary lighting and equipment. The Government reserves the right to accept or reject night work on the day following night activities by the Contractor.

PART 2 PRODUCTS

2.1 EQUIPMENT

2.1.1 Surface Preparation and Paint Removal

2.1.1.1 Surface Preparation Equipment for Roads and Automotive Parking Areas

Submit a surface preparation equipment list by serial number, type, model, and manufacturer. Include descriptive data indicating area of coverage per pass, pressure adjustment range, tank and flow capacities, and safety precautions required for the equipment operation. Mobile equipment must allow for removal of markings without damaging the pavement surface or joint sealant. Maintain machines, tools, and equipment used in the performance of the work in satisfactory operating condition.

2.1.2 Application Equipment

Submit application equipment list appropriate for the material(s) to be used. Include manufacturer's descriptive data and certification for the planned use that indicates area of coverage per pass, pressure adjustment range, tank and flow capacities, and all safety precautions required for operating and maintaining the equipment. Provide and maintain machines, tools, and equipment used in the performance of the work in satisfactory operating condition, or remove them from the work site. Provide mobile and maneuverable application equipment to the extent that straight lines can be followed and normal curves can be made in a true arc.

2.1.2.1 Paint Application Equipment

2.1.2.1.1 Hand-Operated, Push-Type Machines

Provide hand-operated push-type applicator machine of a type commonly used for application of water based paint or two-component, chemically curing paint, thermoplastic, or preformed tape, to pavement surfaces for small marking projects, such as legends and cross-walks, automotive parking areas, or surface painted signs. Provide applicator machine equipped with the necessary tanks and spraying nozzles capable of applying paint

uniformly at coverage specified. Hand operated spray guns may be used in areas where push-type machines cannot be used.

2.1.2.1.2 Self-Propelled or Mobile-Drawn Spraying Machines

Provide self-propelled or mobile-drawn spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. Provide machine having a speed during application capable of applying the stripe widths indicated at the paint coverage rate specified herein and of even uniform thickness with clear-cut edges.

2.1.2.1.2.1 Road Marking

Provide equipment used for marking roads capable of placing the prescribed number of lines at a single pass as solid lines, intermittent lines, or a combination of solid and intermittent lines using a maximum of three different colors of paint as specified.

2.2 MATERIALS

Use waterborne paint with retroreflective media for roads. Use non-reflectorized waterborne paint for automotive parking areas. The maximum allowable VOC content of pavement markings is 150 grams per liter. Color of markings are indicated on the drawings and must conform to ASTM D6628 for roads and automotive parking areas. Provide materials conforming to the requirements specified herein.

2.2.1 Waterborne Paint

MPI 97.

2.2.2 Reflective Media

2.2.2.1 Reflective Media for Roads

AASHTO M 247, Type 1.

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Testing for Moisture

Test the pavement surface for moisture before beginning pavement marking after each period of rainfall, fog, high humidity, or cleaning, or when the ambient temperature has fallen below the dew point. Do not commence marking until the pavement is sufficiently dry and the pavement condition has been approved by the Contracting Officer or authorized representative.

Employ the "plastic wrap method" to test the pavement for moisture as follows: Cover the pavement with a 12 inch by 12 inch section of clear plastic wrap and seal the edges with tape. After 15 minutes, examine the plastic wrap for any visible moisture accumulation inside the plastic. Do not begin marking operations until the test can be performed with no visible moisture accumulation inside the plastic wrap. Re-test surfaces when work has been stopped due to rain.

3.1.2 Surface Preparation Demonstration

Prior to surface preparation, demonstrate the proposed procedures and equipment. Prepare areas large enough to determine cleanliness and rate of cleaning.

3.2 EXTERIOR SURFACE PREPARATION

Allow new pavement surfaces to cure for a period of not less than 30 days before application of marking materials. Thoroughly clean surfaces to be marked before application of the paint. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods as required. Remove other coatings adhering to the pavement by water blasting.

3.2.1 Early Painting of Asphalt Pavements

For asphalt pavement systems requiring painting application at less than 30 days, apply the paint and beads at half the normal application rate, followed by a second application at the normal rate after 30 days.

3.3 APPLICATION

Apply pavement markings to dry pavements only.

3.3.1 Paint

Apply paint pneumatically with approved equipment at rate of coverage specified herein. Provide guidelines and templates as necessary to control paint application. Take special precautions in marking numbers, letters, and symbols. Sharply outline all edges of markings. The maximum drying time requirements of the paint specifications will be strictly enforced, to prevent undue softening of bitumen, and pickup, displacement, or discoloration by tires of traffic. If there is a deficiency in drying of the markings, painting operations must cease until the cause of the slow drying is determined and corrected.

3.3.1.1 Waterborne Paint

3.3.1.1.1 Roads

Apply paint at a rate of 105 plus or minus 5 square feet per gallon. Apply AASHTO M 247 Type 1 beads at a rate of 7 plus or minus 0.5 pounds of glass spheres per gallon.

3.3.2 Cleanup and Waste Disposal

Keep the worksite clean and free of debris and waste from the removal and application operations. Dispose of debris at approved sites.

3.4 FIELD QUALITY CONTROL

3.4.1 Material Inspection

Examine material at the job site to determine that it is the material referenced in the report of test results or certificate of compliance.Provide test results substantiating conformance to the specified requirements with each certificate of compliance.

3.4.2 Dimensional Tolerances

Apply all markings in the standard dimensions provide in the drawings. New markings may deviate a maximum of 10 percent larger than the standard dimension. The maximum deviation allowed when painting over an old marking is up to 20 percent larger than the standard dimensions.

3.4.3 Bond Failure Verification

Inspect newly applied markings for signs of bond failure based on visual inspection and comparison to results from Test Stripe Demonstration paragraph.

3.4.4 Reflective Media and Coating Application Verification

Use a wet film thickness gauge to measure the application of wet paint. Use a microscope or magnifying glass to evaluate the embedment of glass beads in the paint. Verify the glass bead embedment with approximately 50 percent of the individual bead spheres embedded and 50 percent of the individual bead spheres exposed.

-- End of Section --

SECTION 32 92 19

SEEDING
08/17

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 C602	(2013a) Agricultural Liming Materials
ASTM D4427	(2018) Standard Classification of Peat Samples by Laboratory Testing
ASTM D4972	(2013) pH of Soils

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1940; R 1988; R 1998) Federal Seed Act
DOA SSIR 42	(1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.2 DEFINITIONS

1.2.1 Stand of Turf

95 percent ground cover of the established species.

1.3 RELATED REQUIREMENTS

Section 31 23 00.00 20 EXCAVATION AND FILL (CUTLER) and Section 32 05 33 LANDSCAPE ESTABLISHMENT applies to this section for pesticide use and plant establishment requirements, with additions and modifications herein.

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. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Wood Cellulose Fiber Mulch

Fertilizer

Include physical characteristics, and recommendations.

SD-06 Test Reports

Topsoil Composition Tests (reports and recommendations).

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

1.5.1.1 Seed Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

1.5.1.2 Fertilizerand Lime Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer and lime may be furnished in bulk with certificate indicating the above information.

1.5.2 Storage

1.5.2.1 Seed, Fertilizer and Lime Storage

Store in cool, dry locations away from contaminants.

1.5.2.2 Topsoil

Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

1.5.2.3 Handling

Do not drop or dump materials from vehicles.

1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS

1.6.1 Restrictions

Do not plant when the ground is frozen, snow covered, muddy, or when air temperature exceeds 90 degrees Fahrenheit.

1.7 TIME LIMITATIONS

1.7.1 Seed

Apply seed within twenty four hours after seed bed preparation.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Classification

Provide State-approved seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weedseed content, and inert material. Label in conformance with AMS Seed Act and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected.

2.1.2 Planting Dates

Planting Season	Planting Dates
Season 1	May 1 to June 15
Season 2	Aug 15 to Sept 15
Temporary Seeding	Sept 15 to Nov 1

2.1.3 Seed Purity

Botanical Name	Common Name	Minimum Percent Pure Seed	Minimum Percent Germination and Hard Seed	Maximum Percent Weed Seed
Poa pratnesis	Kentucky Bluegrass	85	95	0.5
Festuca rubra	Chewings,Red Fesque	85	95	0.5
Lolium perenne	Perennial Ryegrass	85	95	0.5

2.1.4 Seed Mixture by Weight

Variety	Percent (by Weight)
Kentucky Bluegrass	33
Chewings,Red Fesque	33
Perennial Ryegrass	33

Proportion seed mixtures by weight. Temporary seeding must later be replaced by a permanent stand of grass. The same requirements of turf establishment for Season 2 apply for temporary seeding.

2.2 TOPSOIL

2.2.1 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph COMPOSITION. When available topsoil must be existing surface soil stripped and stockpiled on-site in accordance with Section 31 23 00.00 20 EXCAVATION AND FILL (CUTLER).

2.2.2 Off-Site Topsoil

Conform to requirements specified in paragraph COMPOSITION. Additional topsoil must be furnished by the Contractor.

2.2.3 Composition

Containing from 5 to 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4 inch screen. The pH must be tested in accordance with ASTM D4972. Topsoil must be free of sticks, stones, roots, and other debris and objectionable materials. Include nutrient recommendations with test results. Other components must conform to the following limits:

Silt	7 to 17 percent
Clay	4 to 12 percent
Sand	70 to 82 percent
pH	5.5 to 7.0
Soluble Salts	600 ppm maximum

2.3 SOIL CONDITIONERS

Add conditioners to topsoil as required to bring into compliance with "composition" standard for topsoil as specified herein.

2.3.1 Lime

Commercial grade hydrate limestone containing a calcium carbonate equivalent (C.C.E.) as specified in ASTM C602 of not less than 110 percent.

2.3.2 Aluminum Sulfate

Commercial grade.

2.3.3 Sulfur

100 percent elemental

2.3.4 Iron

100 percent elemental

2.3.5 Peat

Natural product of peat moss derived from a freshwater site and conforming to ASTM D4427 as modified herein. Shred and granulate peat to pass a 1/2 inch mesh screen and condition in storage pile for minimum 6 months after excavation.

2.3.6 Sand

Clean and free of materials harmful to plants.

2.3.7 Perlite

Horticultural grade.

2.3.8 Composted Derivatives

Ground bark, nitrolized sawdust, humus or other green wood waste material free of stones, sticks, and soil stabilized with nitrogen and having the following properties:

2.3.8.1 Particle Size

Minimum percent by weight passing:

No. 4 mesh screen	95
No. 8 mesh screen	80

2.3.8.2 Nitrogen Content

Minimum percent based on dry weight:

Fir Sawdust	0.7
Fir or Pine Bark	1.0

2.3.9 Gypsum

Coarsely ground gypsum comprised of calcium sulfate dihydrate 80 percent, calcium 18 percent, sulfur 14 percent; minimum 96 percent passing through 20 mesh screen, 100 percent passing thru 16 mesh screen.

2.3.10 Calcined Clay

Calcined clay must be granular particles produced from montmorillonite clay calcined to a minimum temperature of 1200 degrees F. Gradation: A minimum 90 percent must pass a No. 8 sieve; a minimum 99 percent must be retained on a No. 60 sieve; and material passing a No. 100 sieve must not exceed 2 percent. Bulk density: A maximum 40 pounds per cubic foot.

2.4 FERTILIZER

2.4.1 Granular Fertilizer

Organic granular controlled release fertilizer containing the minimum percentages, by weight, of plant food nutrients identified by laboratory soil testing.

2.4.2 Hydroseeding Fertilizer

Controlled release fertilizer, to use with hydroseeding and composed of pills coated with plastic resin to provide a continuous release of nutrients for at least 6 months and containing the minimum percentages, by weight, of plant food nutrients identified by laboratory soil testing.

2.5 MULCH

Mulch must be free from noxious weeds, mold, and other deleterious materials.

2.5.1 Straw

Stalks from oats, wheat, rye, barley, or rice. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw must contain no fertile seed.

2.5.2 Hay

Air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Hay must be sterile, containing no fertile seed.

2.5.3 Wood Cellulose Fiber Mulch

Use recovered materials of either paper-based (100 percent post-consumer content) or wood-based (100 percent total recovered content) hydraulic mulch. Processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of materials application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 5.5 to 8.2. Use with hydraulic application of grass seed and fertilizer.

2.6 WATER

Source of water must be approved by Contracting Officer and of suitable quality for irrigation, containing no elements toxic to plant life.

2.7 EROSION CONTROL MATERIALS

Erosion control material must conform to the following:

2.7.1 Erosion Control Blanket

100 percent agricultural straw stitched with a degradable nettings, designed to degrade within 18 months.

2.7.2 Erosion Control Fabric

Fabric must be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips must have a minimum life of 6 months.

2.7.3 Erosion Control Net

Net must be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately one inch square.

2.7.4 Hydrophilic Colloids

Hydrophilic colloids must be physiologically harmless to plant and animal life without phytotoxic agents. Colloids must be naturally occurring, silicate powder based, and must form a water insoluble membrane after curing. Colloids must resist mold growth.

2.7.5 Erosion Control Material Anchors

Erosion control anchors must be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 EXTENT OF WORK

Provide soil preparation prior to planting (including soil conditioners as required), fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

3.1.1.1 Topsoil

Provide on-site topsoil and supplement with off-site topsoil to meet indicated finish grade. After areas have been brought to indicated finish grade, incorporate fertilizer pH adjusters and soil conditioners into soil a minimum depth of 4 inches by disking, harrowing, tilling or other method approved by the Contracting Officer. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.1.1.1.1 Topsoil Subgrade Preparation

Scarify existing subsoil to a depth of 4-inches prior to placing topsoil.

3.1.1.2 Soil Conditioner Application Rates

Apply soil conditioners at rates as determined by laboratory soil analysis of the soils at the job site.

3.1.1.3 Fertilizer Application Rates

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site.

3.2 SEEDING

3.2.1 Seed Application Seasons and Conditions

Immediately before seeding, restore soil to proper grade. Do not seed when ground is muddy, frozen, snow covered or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the above seeding dates or conditions, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within twenty four hours after seedbed preparation. Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing.

3.2.2 Seed Application Method

Seeding method must be broadcasted and drop seeding or hydroseeding.

3.2.2.1 Broadcast and Drop Seeding

Seed must be uniformly broadcast at the rate of 4 pounds per 1000 square feet. Use broadcast or drop seeders. Sow one-half the seed in one

direction, and sow remainder at right angles to the first sowing. Cover seed uniformly to a maximum depth of 1/4 inch in clay soils and 1/2 inch in sandy soils by means of spike-tooth harrow, cultipacker, raking or other approved devices.

3.2.2.2 Hydroseeding

First, mix water and fiber. Wood cellulose fiber, paper fiber, or recycled paper must be applied as part of the hydroseeding operation. Fiber must be added at 1,000 pounds, dry weight, per acre. Then add and mix seed and fertilizer to produce a homogeneous slurry. Seed must be mixed to ensure broadcasting at the rate of 4 pounds per 1000 square feet. When hydraulically sprayed on the ground, material must form a blotter like cover impregnated uniformly with grass seed. Spread with one application with no second application of mulch.

3.2.3 Mulching

3.2.3.1 Hay or Straw Mulch

Hay or straw mulch must be spread uniformly at the rate of 2 tons per acre. Mulch must be spread by hand, blower-type mulch spreader, or other approved method. Mulching must be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch must not be bunched or clumped. Sunlight must not be completely excluded from penetrating to the ground surface. All areas installed with seed must be mulched on the same day as the seeding. Mulch must be anchored immediately following spreading.

3.2.3.2 Mechanical Anchor

Mechanical anchor must be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.2.3.3 Non-Asphaltic Tackifier

Hydrophilic colloid must be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture must be applied over the area.

3.2.3.4 Asphalt Adhesive Coated Mulch

Hay or straw mulch may be spread simultaneously with non-asphaltic adhesive applied at a rate between 10 to 13 gallons per 1000 square feet, using power mulch equipment which must be equipped with suitable asphalt pump and nozzle. The adhesive-coated mulch must be applied evenly over the surface. Sunlight must not be completely excluded from penetrating to the ground surface.

3.2.4 Rolling

Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width. If seeding is performed by hydroseeding, rolling may be eliminated.

3.2.5 Watering

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to insure thorough wetting of soil to a depth of 2 inches without run off. During the germination process, seed is to be kept actively growing and not allowed to dry out.

3.3 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use.

3.4 RENOVATION OF EXISTING TURF AREA

3.4.1 Aeration

Upon completion of weed eradication operations and Contracting Officer's approval to proceed, aerate turf areas indicated , by approved device. Core, by pulling soil plugs, to a minimum depth of 4 inches. Leave all soil plugs, that are produced, in the turf area. Remove all debris generated during this operation off site. After aeration operations are complete, topdress entire area with 1/4 inch depth with topsoil.

3.4.2 Overseeding

Apply seed in accordance with and at rates indicated in applicable portions of paragraph SEED APPLICATION METHOD.

3.5 RESTORATION

Restore to original condition existing turf areas which have been damaged during turf installation operations at the Contractor's expense. Keep clean at all times at least one paved pedestrian access route and one paved vehicular access route to each building. Clean other paving when work in adjacent areas is complete.

-- End of Section --

SECTION 33 40 00

STORM DRAINAGE UTILITIES
02/10

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.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 294	(2017) Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter

ASTM INTERNATIONAL (ASTM)

ASTM A716	(2008; R 2014) Standard Specification for Ductile Iron Culvert Pipe
ASTM C231/C231M	(2017a) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C425	(2004; R 2013) Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings
ASTM C443	(2012; R 2017) Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C76	(2018) Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C990	(2009; R 2014) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM D1557	(2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2700 kN-m/m3)
ASTM D1751	(2004; E 2013; R 2013) Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

ASTM D1752	(2004a; R 2013) Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion
ASTM D1784	(2011) Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D2167	(2015) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D3034	(2016) Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3350	(2012) Polyethylene Plastics Pipe and Fittings Materials
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

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-03 Product Data

Pipe for Culverts and Storm Drains; G

Miscellaneous Materials

Erosion Control Rip Rap

SD-07 Certificates

Determination of Density

Post-Installation Inspection Report, G

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall

be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.3.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS

Pipe for culverts and storm drains shall be of the sizes indicated and shall conform to the requirements specified. Provide reinforced concrete pipe for two road culvert replacements as indicated on drawings.

2.1.1 Concrete Pipe

Manufactured in accordance with and conforming to ASTM C76, Class I.

2.1.2 Ductile Iron Culvert Pipe

ASTM A716.

2.1.3 Poly Vinyl Chloride (PVC) Pipe

Submit the pipe manufacturer's resin certification, indicating the cell classification of PVC used to manufacture the pipe, prior to installation of the pipe.

2.1.3.1 Type PSM PVC Pipe

ASTM D3034, Type PSM, maximum SDR 35, produced from PVC certified by the Manufacturer as meeting the requirements of ASTM D1784, minimum cell class 12454-B.

2.1.4 Polyethylene (PE) Pipe

Submit the pipe manufacturer's resin certification, indicating the cell classification of PE used to manufacture the pipe, prior to installation of the pipe. The minimum cell classification for polyethylene plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D3350.

2.1.4.1 Corrugated PE Pipe

AASHTO M 294, Type S. For slow crack growth resistance, acceptance of resins shall be determined by using the notched constant ligament-stress (NCLS) test meeting the requirements of AASHTO M 294. Pipe walls shall have the following properties:

Nominal Size (inch))	Minimum Wall Area (square in/ft)	Minimum Moment of Inertia of Wall Section (in. to the 4th/in.)
12	1.5	0.024
15	1.91	0.053
18	2.34	0.062
24	3.14	0.116

2.2 MISCELLANEOUS MATERIALS

2.2.1 Concrete

Unless otherwise specified, concrete and reinforced concrete shall conform to the requirements for 4,000 psi concrete under Section 03 30 00 CAST-IN-PLACE CONCRETE. The concrete mixture shall have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Air content shall be determined in accordance with ASTM C231/C231M. The concrete covering over steel reinforcing shall not be less than 1-1/2 inches thick for covers, walls and flooring. Concrete covering deposited directly against the ground shall have a thickness of at least 3 inches between steel and ground. Expansion-joint filler material shall conform to ASTM D1751, or ASTM D1752, or shall be resin-impregnated fiberboard conforming to the physical requirements of ASTM D1752.

2.2.2 Joints

2.2.2.1 Flexible Watertight Joints

a. Flexible watertight joints shall be made with plastic or rubber-type gaskets for concrete pipe. The design of joints and the physical requirements for preformed flexible joint sealants shall conform to ASTM C990, and rubber-type gaskets shall conform to ASTM C443. Factory-fabricated resilient joint materials shall conform to ASTM C425. Gaskets shall have not more than one factory-fabricated splice, except that two factory-fabricated splices of the rubber-type gasket are permitted if the nominal diameter of the pipe being gasketed exceeds 54 inches.

b. Rubber gaskets shall comply with the oil resistant gasket requirements of ASTM C443. Certified copies of test results shall be delivered to the Contracting Officer before gaskets or jointing materials are installed. Alternate types of watertight joint may be furnished, if specifically approved.

2.2.2.2 PVC Plastic Pipes

Joints shall be solvent cement or elastomeric gasket type in accordance with the specification for the pipe and as recommended by the pipe manufacturer.

2.2.2.3 Corrugated PE Plastic Pipe

Pipe joints shall be soil tight and shall conform to the requirements in AASHTO M 294. Pipe shall be bell and spigot with gasket.

2.2.2.4 Ductile Iron Pipe

Couplings and fittings shall be as recommended by the pipe manufacturer.

2.3 EROSION CONTROL RIP RAP

Provide non-erodible rock not less than 4 inches and not exceeding 15 inches in its greatest dimension and choked with sufficient small angular rocks to provide a dense mass with a minimum thickness of as indicated.

PART 3 EXECUTION

3.1 INSTALLATION OF PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of Section 31 23 00.00 22 EXCAVATION AND FILL and the requirements specified below.

3.1.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 12 inches to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Sheeting and bracing, where required, shall be placed within the trench width as specified, without any overexcavation.

3.1.2 Removal of Rock

Rock excavation shall be as specified and defined in Section 31 23 00.00 22 EXCAVATION AND FILL.

3.1.3 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select granular material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor while performing shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the Government.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. Bedding materials are specified in Section 31 23 00.00 20 EXCAVATION AND FILL (CUTLER).

3.3 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or

damaged pipe shall not be used. Plastic pipe shall be protected from exposure to direct sunlight prior to laying, if necessary to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated pipe shall be placed in the same vertical plane as the major axis of the pipe. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. Deflection of installed flexible pipe shall not exceed the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (percent)
Plastic (PVC and PE	5

Note post installation requirements of paragraph DEFLECTION TESTING in PART 3 of this specification for all pipe products including deflection testing requirements for flexible pipe.

3.3.1 Concrete, PVC, and Ductile Iron

Laying shall proceed upgrade with spigot ends of bell-and-spigot pipe and tongue ends of tongue-and-groove pipe pointing in the direction of the flow.

3.3.2 PE Pipe

Laying shall be with the separate sections joined firmly on a bed shaped to line and grade and shall follow manufacturer's guidelines.

3.4 JOINTING

3.4.1 Concrete Pipe

3.4.1.1 Flexible Watertight Joints

Gaskets and jointing materials shall be as recommended by the particular manufacturer in regard to use of lubricants, cements, adhesives, and other special installation requirements. Surfaces to receive lubricants, cements, or adhesives shall be clean and dry. Gaskets and jointing materials shall be affixed to the pipe not more than 24 hours prior to the installation of the pipe, and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Gaskets and jointing materials shall be inspected before installing the pipe; any loose or improperly affixed gaskets and jointing materials shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pushed home. If, while the joint is being made the gasket becomes visibly dislocated the pipe shall be removed and the joint remade.

3.5 DRAINAGE STRUCTURES

3.5.1 Walls and Headwalls

Construction shall be as indicated.

3.6 BACKFILLING

3.6.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. The fill shall be thoroughly compacted under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation equal to the midpoint (spring line) of concrete pipe or has reached an elevation of at least 12 inches above the top of the pipe for flexible pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding 6 inches. Tests for density shall be made as necessary to ensure conformance to the compaction requirements specified below. Where it is necessary, in the opinion of the Contracting Officer, that sheeting or portions of bracing used be left in place, the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath structures or pavements.

3.6.2 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified below. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be compacted by rolling parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted in layers not exceeding 6 inches. Use select granular material for this entire region of backfill for flexible pipe installations.

3.6.3 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert or storm drain at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced.

3.6.4 Compaction

3.6.4.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.6.4.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures shall be compacted at the approved moisture content to the following applicable minimum density, which will be determined as specified below.

a. Under paved roads and parking areas, and similar-use pavements including adjacent shoulder areas, the density shall be not less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material, up to the elevation where requirements for pavement subgrade materials and compaction shall control.

b. Under unpaved or turfed traffic areas, density shall not be less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.

c. Under nontraffic areas, density shall be not less than that of the surrounding material.

3.7 FIELD QUALITY CONTROL

3.7.1 Tests

3.7.1.1 Determination of Density

Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to ensure that specified density is being obtained. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D1557 except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. Field density tests shall be determined in accordance with ASTM D2167 or ASTM D6938. When ASTM D6938 is used, the calibration curves shall be checked and adjusted, if necessary, using the sand cone method as described in paragraph Calibration of the referenced publications. ASTM D6938 results in a wet unit weight of soil and ASTM D6938 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D6938. Test results shall be furnished the Contracting Officer. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed.

3.7.1.2 Deflection Testing

Conduct deflection test no sooner than 30 days after completion of final backfill and compaction testing. Clean or flush all lines prior to testing. Perform a deflection test on entire length of installed flexible pipeline upon completion of work adjacent to and over the pipeline, including backfilling, placement of fill, grading, paving, placement of concrete, and any other superimposed loads. Deflection of pipe in the installed pipeline under external loads shall not exceed limits in paragraph PLACING PIPE above as percent of the average inside diameter of pipe. Use a mandrel to determine if allowable deflection has been exceeded.

3.7.1.2.1 Mandrel

Pass the mandrel through each run of pipe by pulling it by hand. If deflection readings in excess of the allowable deflection of average inside diameter of pipe are obtained, stop and begin test from the opposite direction. The mandrel must meet the Pipe Manufacture's recommendations and the following requirements. Provide a Mandrel that is rigid, nonadjustable, has a minimum of 9 fins, pulling rings at each end, and is engraved with the nominal pipe size and mandrel outside diameter. The mandrel must be 5 percent less than the certified-actual pipe diameter for Plastic Pipe, 5 percent less than the certified-actual pipe diameter for Corrugated Steel and Aluminum, 3 percent less than the certified-actual pipe diameter for Concrete-Lined Corrugated Steel and Ductile Iron Culvert. The Government will verify the outside diameter(OD)of the Contractor provided mandrel through the use of Contractor provided proving rings.

3.7.2 Inspection

3.7.2.1 Post-Installation Inspection

Visually inspect each segment of concrete pipe for alignment, settlement, joint separations, soil migration through the joint, cracks, buckling, bulging and deflection. An engineer must evaluate all defects to determine if any remediation or repair is required.

3.7.2.1.1 Concrete

Cracks with a width greater than 0.01 inches. An engineer must evaluate all pipes with cracks with a width greater than 0.01 inches but less than 0.10 inches to determine if any remediation or repair is required.

3.7.2.1.2 Flexible Pipe

Check each flexible pipe (PE, PVC) for rips, tears, joint separations, soil migration through the joint, cracks, localized bucking, bulges, settlement and alignment.

3.7.2.1.3 Post-Installation Inspection Report

The deflection results and final post installation inspection report must include: a copy of all video taken, pipe location identification, equipment used for inspection, inspector name, deviation from design, grade, deviation from line, deflection and deformation of flexible pipe, inspector notes, condition of joints, condition of pipe wall (e.g. distress, cracking, wall damage dents, bulges, creases, tears, holes, etc.).

3.7.3 Repair Of Defects

3.7.3.1 Deflection Testing

When deflection readings are in excess of the allowable deflection of average inside diameter of pipe are obtained, remove pipe which has excessive deflection and replace with new pipe. Retest 30 days after completing backfill, leakage testing and compaction testing.

3.7.3.2 Inspection

Replace pipe or repair defects indicated in the Post-Installation Inspection Report.

3.7.3.2.1 Concrete

Replace pipes having cracks with a width greater than 0.1 inches.

3.7.3.2.2 Flexible Pipe

Replace pipes having cracks or splits.

3.8 PROTECTION

Protect storm drainage piping and adjacent areas from superimposed and external loads during construction.

3.9 WARRANTY PERIOD

Pipe segments found to have defects during the warranty period must be replaced with new pipe and retested.

-- End of Section --

SECTION 35 31 19

STONE, CHANNEL, SHORELINE/COASTAL PROTECTION FOR STRUCTURES
11/23

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 C127	(2015) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C295/C295M	(2019) Standard Guide for Petrographic Examination of Aggregates for Concrete
ASTM D3740	(2019) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM D4992	(2014; E 2015) Evaluation of Rock to be Used for Erosion Control
ASTM D5312/D5312M	(2012; R 2013) Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions
ASTM D5313/D5313M	(2012; R 2013) Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 148	(1969) Method of Testing Stone for Expansive Breakdown on Soaking in Ethylene Glycol
EM 1110-2-1601	(1991; 1994 Change 1) Engineering and Design -- Hydraulic Design of Flood Control Channels

1.2 DEFINITIONS

1.2.1 Bank Stabilization

This paragraph explains certain terminology which is common to construction of bank stabilization work on the shoreline and which may not be self explanatory in the subsequent applicable provisions of the technical specifications and on the drawings.

1.2.1.1 Revetments

The term "revetment" applies to various types of stabilization structures that are constructed along the shoreline approximately parallel to the current. The revetments are constructed of stone or piling.

1.2.1.2 Dikes

The term "dike" applies to the types of stabilization structures that are constructed along the river at an angle to the current. The dikes are constructed of stone or piling.

1.2.2 Standard Drawings

Details of various types of structures in general use on the roadway side slopes and shoreline are shown on standard drawings forming a part of these specifications.

1.2.3 Stone Protection

Stone Protection is defined as a system which includes a layer of bedding material or layers of filter material beneath a layer or layers of riprap. Stone protection is placed around structures in slack water or within a dewatered site. Stone protection may also be used to protect channel banks when it is placed in the dry or in slack water.

1.2.4 Riprap

Riprap is defined as a material having a gradation band similar to those specified in EM 1110-2-1601, Chapter 3, uniform graded material. Riprap is normally produced by mechanical methods, with a jaw crusher and grizzly after the stone has been mined by blasting in a quarry. Riprap gradations have a maximum top size of 3.5 tons.

1.2.5 Graded Stone

Graded Stone is defined as material with gradations that are produced by the mining technique and minimal additional processing other than the use of a skeleton bucket or a bar grizzly. The gradation band have more fines than riprap and have gradations with top size up to 3.5 tons and could be classified as being well graded.

1.2.6 Channel Protection

Channel protection is stone placed in a current as revetment, dikes, or slope paving without the use of a separate layer of bedding or filter material. In this type of environment, bedding sand or geotextiles and materials with gradation bands with a top size of 150 mm (6 inches) will not stay where placed.

1.2.7 Shoreline Protection

Shoreline Protection is defined as a system of bedding or filter materials and stone used to protect coastlines of lakes and oceans and for harbor protection.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S"

classification. Submittals not having a "G" or "S" classification are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Riprap; G

Filter Material; G

Bedding Material; G

Ready-Mixed Concrete Grout

Conveying and Placing

Admixtures

Curing Materials

Batching and Mixing Equipment

Gaging Table Data

Manufactured Derrick Stone;

Concrete Grout Mixture Proportions;

Bulk Specific Gravity of Stone; G

SD-04 Samples

Stone; G,

SD-06 Test Reports

Gradation Test

Evaluation Testing of Stone

Bedding Material

Bulk Specific Gravity

SD-07 Certificates

Stone

Bedding Material

Filter Material

Laboratory; G

Weigh Scale Certification

Certified Weight Scale Tickets

1.4 QUALITY ASSURANCE

1.4.1 General

All stone must be durable material as approved by the Contracting Officer. Provide stone of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. Ensure stone is free from cracks, blast fractures, bedding, seams and other defects or discontinuities that would tend to increase its deterioration from natural causes. Inspect for discontinuities, cracks, fractures, seams and defects by visual examination. If, by visual examination, it is determined that 10 percent or more of the stone produced contains significant hairline cracks, then reject all stone produced by the means and measures which caused the fractures. A hairline crack that is defined as being detrimental must have a minimum width of 4 mil and continuous for one-third the dimension of at least two sides of the stone. Provide stone that is clean and adequately free from all foreign matter. Remove any foreign material adhering to or combined with the stone as a result of stockpiling prior to placement.

1.4.2 Sources

Provide Lab testing results obtained not more than 5 years prior to date of Contract Award to ensure the data are representative and that the quarry has not moved into a section of substantially different material. Each source approval request is evaluated on a case by case basis. Evaluation requires submission of up-to-date lab testing results with every source approval. Approval testing will be at the contractor or quarry's expense. Test results will be accepted from a certified independent laboratory in lieu of testing at the government's laboratory at the discretion of the Contracting Officer.

If approved, furnish stone from the source or from any other source designated by the Contractor and accepted by the Contracting Officer, subject to the conditions herein stated. Satisfactory service records on other similar work may be considered by the Contracting Officer in the investigation. In order for stone to be acceptable on the basis of service records, stone of a similar quantity and size must have been placed in a similar thickness and exposed to weathering under similar conditions as are anticipated for this contract, and must have satisfactorily withstood such weathering for a minimum of 20 years. If no such records are available, the Government may choose to have tests conducted at the Contractor's expense to assure the acceptability of the stone.

a. Selection of Source. Designate in writing only one source or one combination of sources from which the stone is proposed to be furnished from. It is the Contractor's responsibility to determine that the stone source or combination of sources selected is capable of providing the quality, quantities and gradation needed and at the rate needed to maintain the scheduled progress of the work.

c. Acceptance of Materials. Acceptance of a source of stone is not to be construed as acceptance of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for stone as determined by the Contracting Officer. The Contracting Officer also reserves the right to reject individual units of produced specified materials in stockpiles at the quarry, all transfer points, and at the

project construction site when such materials are determined to be unsuitable. During the course of the work, the stone may be tested by the Government, if the Contracting Officer determines that testing is necessary. During the contract period, both prior to and after materials are delivered to the job site, visual inspections and measurements of the stone materials may be performed by the Contracting Officer. If the Contracting Officer, during the inspections, finds that the stone quality, gradation or weights of stone being furnished are not as specified or are questionable, re-sampling and re-testing is required. Sampling of the delivered stone for testing and the manner in which the testing is to be performed must be as directed by the Contracting Officer. Perform this additional sampling and testing at the Contractor's expense when test results indicate that the materials do not meet specified requirements. Remove or dispose of any rejected material as specified and at the Contractor's expense.

1.4.3 Evaluation Testing of Stone

Submit a copy of the laboratory inspection report along with actions taken to correct deficiencies and a copy of the test reports, prior to delivery of such material to the worksite; since quality test on the stone in accordance with PART 2 paragraph EVALUATION TESTING OF STONE is the responsibility of the Contractor. The tests to which the stone may be subjected will include petrographic analysis, specific gravity, unit weight, absorption, wetting and drying, freezing and thawing and such other tests as may be considered necessary to demonstrate that the stone is of a satisfactory quality which is at least equivalent to stone from the sources listed at the end of this section.

a. Unit Weight, Bulk Specific Gravity, saturated surface dry (SSD) and Absorption. Stone must weigh more than 155 pounds per cubic foot, have a bulk specific gravity, saturated surface dry, (SSD), greater than 2.48. Provide stone with an absorption less than 2 percent unless other tests and service records show that the stone is satisfactory. The method of test for unit weight, bulk specific gravity (SSD) and absorption will be ASTM C127.

b. Samples. Take samples of stone from a source by a representative of the quarry under the supervision of the QC Manager for testing and acceptance prior to delivery of any stone from this source to the site of the work. Samples consist of at least three pieces of stone, roughly cubical in shape and weighing no less than 150 pounds each from each unit that will be used in the production of the required stone. If the source is an undeveloped quarry, or if the operation has been dormant for more than one year such that fresh samples are not available, expose fresh rock for 20 feet horizontally and for the full height of the face proposed for production, prior to the field evaluation..

c. Tests. The tests will be conducted in accordance with applicable Corps of Engineers methods of tests given in the Handbook for Concrete and Cement or ASTM methods of tests.

1.5 CONSTRUCTION TOLERANCES

The finished surface and stone layer thickness is not allowed to deviate from the lines and grades shown. The intention is that the work is built generally to the required elevations, slope and grade and that the outer

surfaces are even and present a neat appearance. Remove or rearrange placed material not meeting these limits as directed by the Contracting Officer.

PART 2 PRODUCTS

2.1 BEDDING MATERIAL

2.1.1 General

Submit test reports attesting that the filter material meet specified requirements.

2.2 FILTER MATERIAL

Submit certificates of compliance attesting that the materials meet specification requirements. Provide geotextiles as specified in Section 31 05 19.13 GEOTEXTILES FOR EARTHWORK.

2.3 STONE

2.3.1 General

2.3.1.1 Evaluation Testing of Stone

Have evaluation tests performed on stone samples collected from the proposed source. Perform quarry investigation by a registered geologist or registered engineer. The tests include petrographic examination (ASTM C295/C295M), bulk specific gravity (SSD),unit weight, absorption (ASTM C127), resistance of stone to freezing and thawing(ASTM D5312/D5312), resistance to wetting and drying (ASTM D5313/D5313M). The laboratory to perform the required testing must be validated based on relevant paragraphs of ASTM D3740, and no work requiring testing is permitted until the laboratory has been inspected and validated unless approved prior to testing by the Contracting Officer. A copy of the documents, provided by the Materials Testing Center (MTC) at CEWES, that validates that the laboratory can perform the required tests. List the individual tests for which the validation covers along with the date of the inspection.

a. Bulk Specific Gravity Range. All stone must have a minimum bulk specific gravity, saturated surface dry (SSD), of 2.50 and a maximum bulk specific gravity of not more than 2.90 based upon water having a unit weight of 62.4 pounds per cubic foot. The method of test for bulk specific gravity (SSD) is ASTM C127.

b. Unit Weight and Absorption. Stone must weigh more than 155 pounds per cubic foot and have a bulk specific gravity, saturated surface dry, greater than 2.48. Provide stone with an absorption less than 2 percent unless other tests and service records show that the stone is satisfactory. The method of test for unit weight and absorption is ASTM C127.

c. Petrographic Examination. Evaluate stone in accordance with ASTM C295/C295M which includes information required by ASTM D4992, paragraph 10. Use COE CRD-C 148 to perform Ethylene glycol tests required on rocks potentially containing smectite as specified in ASTM D4992 and on samples identified to contain swelling clays.

d. Resistance to Freezing and Thawing. Use stone with a maximum loss of

5 percent after the number of cycles specified in ASTM D5312/D5312M, Figure 1, when determining the durability of stone when subjected to freezing and thawing in accordance with ASTM D5312/D5312M, except the surface area of one side of the sample must be between 144 and 2304 square inches.

e. Samples. Take samples of stone from the source for testing and acceptance prior to delivery of any stone from this source to the site of the work. Include in the information provided with the samples the location within the quarry or source from which the sample was taken along with a field examination of the quarry or source. Include the information outline in ASTM D4992, paragraph 7, in the field examination. Samples consist of at least three pieces of stone, roughly cubical in shape and weighing no less than 150 pounds each from each unit that is used in the production of the required stone. If the source is an undeveloped quarry, or if the operation has been dormant for more than one year such that fresh samples are not available, expose fresh rock for 20 feet horizontally and for the full height of the face proposed for production, prior to the field evaluation. Provide samples to a laboratory validated by the government to perform the required tests.

f. Tests. Conduct the tests in accordance with applicable ASTM and Corps of Engineers methods of tests, given in the Handbook for Concrete and Cement, in a laboratory validated by the government. The cost of testing are borne by the Contractor.

2.3.1.2 Quarry Operations

Conduct quarry operations in a manner to produce stone conforming to the requirements specified. This may involve selective quarrying, handling, processing, blending, and loading as necessary. Controlled blasting and handling of rock to produce rock of the size ranges and quality specified. Techniques such as the use of proper hole diameter, hole depth, hole angle, burden and spacing distances, types and distribution of explosives. delay intervals and sequence, removal of muck piles between each shot, and special handling techniques are required as necessary to produce the specified materials. Specifically design all aspects of blasting operations so that the end product is not damaged from the blasting technique and that the stone is suitable for the intended purpose.

a. Curing Stone

Conduct curing operations on freshly quarried stone to allow it to release stored energy and moisture. This will allow the stone to exhibit initial and subsequent post blasting stress relief and reveal any significant fractures during the energy release and drying-out phase.

b. Stone Quarrying Exclusion Period

Stone quarried between the 15th of September and the 15th of April will not be approved for use in the project. If the stone is not affected by freeze-thaw cycles, and the durability history of the stone demonstrates that quarrying during the exclusion period has not adverse effect on the durability of the stone and the Contracting Officer approves the use of stone quarried during the exclusion period, the stone quarrying period exclusion may be waived by the Contracting Officer. Stone quarried before the the exclusion period

at a time which will not permit sufficient curing time before being subjected to freezing conditions, and which is subject to fracturing as a result of freeze-thaw cycles, will not be approved for use.

c. Temporary Storage at Quarry

Prolonged storage of stone materials prior to shipment from the quarry and prior to permanent placement in the required work are subject to approval of the Contracting Officer.

2.3.1.3 Gradation Test

Perform at least one gradation test(s) per 50,000 tons of each size of riprap and stone placed, but do not perform less than one test. Report gradation tests using the forms, GRADATION TEST DATA SHEET and ENG FORM 4794-R, or approved alternative. Provide sample consisting of no less than 25 tons of riprap and stone, and collect in a random manner which will provide a sample which accurately reflects the actual gradation arriving at the jobsite. Failure of the test on the initial sample and on an additional sample will be considered cause for rejection of the quarry and/or quarry process, and set aside all riprap and stone represented by the failed tests and do not incorporate into the work. Any additional tests required because of the failure of an initial test sample will not be considered as one of the other required tests. If collected by the truckload, each truckload must be representative of the gradation requirements. Refill and rework each pit or void excavated for an in-place test sample to provide a surface void of signs of disturbance. If the gradation test fails, additional gradation tests will be required at the Contractor's expense to delineate the limits of unacceptable stone. Do not count additional gradation tests as part of the minimum number of gradation tests required. Rework and replace the unacceptable stone as necessary to correct the deficiency within the specified gradation or remove the stone from the project site as determined by the Contracting Officer. The Contracting Officer may direct this testing under FAR 52.246-12 Inspection of Construction. Provide all necessary screens, scales and other equipment, and operating personnel, to grade the sample. Certification and test results represent riprap and stone shipped from the quarry. Certification and tests results must be received by the Contracting Officer at the jobsite before the riprap and stone is used in the work.

2.3.1.4 Proportional Dimension Limitations

The maximum aspect ratio (greatest dimension:least dimension) of any piece of stone for size ranges must be not greater than 3:1 when measured across mutually perpendicular axis. Allow no more than 25 percent of the stones within a gradation range to have an aspect ratio greater than 2.5:1.

2.3.1.5 Riprap and Stone Stockpile

Storage of riprap and stone at the worksite is not to be confused with off-site stockpiling of riprap and stone. If the Contractor elects to provide off-site stockpiling areas, notify the Contracting Officer of all such areas.

a. Worksite Stockpile. Place riprap and stone delivered to the work sites, which requires temporary storage in a container suitable for storing the riprap and stone without waste. The container is subject to approval by the Contracting Officer prior to delivery of the riprap

and stone. Upon completion of the work, clean the storage areas of all storage residues and return to their original condition.

2.3.2 Riprap

Use only quarried stone. Provide well graded stone conforming to below

2.3.3 Underlayer Stone

Furnish stones that weigh between 1,490 pounds and 4,090 pounds each, free of fines. Ensure seventy-five percent (75 percent) of the stones weigh greater than 2,575 pounds each.

2.3.4 Armor Stone

Furnish stones that weigh between 2,845 pounds and 6,580 pounds each, free of fines. Ensure seventy-five percent (75 percent) of the stones weigh greater than 4,460 pounds each.

2.3.5 Toe Stone

Furnish stones that weigh between 9,900 pounds and 11,235 pounds each, free of fines. Ensure seventy-five percent (75 percent) of the stones weigh greater than 10,560 pounds each.

PART 3 EXECUTION

3.1 DEMONSTRATION SECTION

Prior to placement of stone, construct a section of stone protection consisting of underlayer stone, armor stone, and toe stone riprap to demonstrate his proposed operations for production placement. Demonstrate procedures and capability of grading, placing toe stone and bank protection within the tolerances specified. The demonstration section must be 50 feet in length and must conform to all applicable specifications.

3.1.1 Methods and Equipment

Demonstrate means, methods and equipment employed for placement of underlayer stone, armor stone, and toe stone conform to the requirements specified. Accurately tabulate quantities of all materials placed within the section and provide immediately to the Contracting Officer for comparison with computed quantities.

3.1.2 Demonstration Section Evaluation

Do not proceed with placing stone protection prior to the approval of the demonstration section. Within a period of 7 days after completion of the section, the Contracting Officer will determine the adequacy of the section to function as part of the permanent construction. The Contractor will be notified as to the acceptability of the section and may be directed to modify methods of construction and remove the section if necessary.

3.1.3 Removal of Demonstration Section

If removal of the demonstration section is required, conduct it in such a manner as to maintain the integrity of the underlying subgrade. Dispose

of unused demonstration section materials at an offsite location.

3.2 BASE PREPARATION

Grade and/or dress areas on which geotextile and stone are to be placed to conform to cross sections shown on the contract drawings within an allowable tolerance of plus 2 inches and minus 4 inches from the theoretical slope lines and grades. The prepared base must be approved by the Contracting Officer. Where such areas are below the allowable minus tolerance limit, restore to grade by fill and then compact to a density equal to the adjacent in place material. Grade and/or restore subaqueous material to conform to cross sections shown on the contract drawings within an allowable tolerance of plus 1 foot and minus 2 feet from the specified slope line and grades. Where such areas are below the allowable minus tolerance limit, fill with sand or other suitable fill as determined by the existing bottom conditions. As an alternative, these areas may be filled with bedding material if approved by the Contracting Officer. Immediately prior to placing the geotextile, the prepared base will be inspected by the Contracting Officer and do not place material thereon until that area has been approved.

3.3 PLACEMENT OF FILTER LAYERS

3.3.1 General

Place geotextile on the prepared base as described below, in accordance with the details shown on the contract drawings, and within the limits either shown on the contract drawings or stake in the field. A tolerance of plus 2 inches and minus 2 inches from the slope lines and grades shown on the contract drawings will be allowed in the finished surface of the filter layers, except ensure that the extreme of this tolerance is not continuous over an area greater than 200 square feet.

3.3.2 Geotextile

Install geotextile as specified in Section 31 05 19.13 GEOTEXTILES FOR EARTHWORK.

3.4 PLACEMENT OF RIPRAP

3.4.1 Placement

Use under water placement rates when the top of the layer to be placed is covered by more than 3 feet of water.

3.4.1.1 Above Water

Place riprap in a manner which will produce a well-graded mass of rock with the minimum practicable percentage of voids, and construct, within the specified tolerances, to the lines and grades shown on the contract drawings or stake in the field. A tolerance of plus 6 inch(es) and minus 6 inch(es) from the slope lines and grades shown on the contract drawings will be allowed in the finished surface of the riprap, except ensure that the extreme of this tolerance is not continuous over an area greater than 200 square feet. The average tolerance above or below the neat lines for the entire job must have no more than 50 percent of the tolerances specified above. Place riprap by means of truck, crane operated skip-pan (box), dragline bucket, clamshell, rock-bucket, hydraulic excavator, trackhoe, or other approved equipment. Pneumatic tired front end loaders

may be used provided that in the opinion of the Contracting Officer no degradation of the rock occurs. Place riprap to its full course thickness in one operation and in such manner as to avoid displacing the filter material. Distribute large stones well and grade the entire mass of stones in their final position to conform to the gradation specified in paragraph RIPRAP, subparagraph GENERAL. Begin placement at the bottom of the area to be covered and continue up slope. Place subsequent loads of material against previously placed material in such a manner as to ensure a relatively homogenous mass. Provide finished riprap that is free from objectionable pockets of small stones and clusters of larger stones. Placing riprap in layers will not be permitted. Placing riprap by dumping it into chutes, or by similar methods likely to cause segregation of the various sizes, is prohibited. Placing riprap by dumping it at the top of the slope and pushing it down the slope is prohibited. Do not operate equipment directly on the completed stone protection system. Produce the desired distribution of the various sizes of stones throughout the mass by selective loading of the material at the quarry or other source; by controlled dumping of successive loads during final placing; or by other methods of placement which will produce the specified results. Each truckload must be representative of the gradation requirements. Rearrange individual stones to the extent necessary to obtain a well-graded distribution of stone sizes as specified above.Maintain the stone protection until accepted by the Contracting Officer; replace any material displaced prior to acceptance due to the Contractor's negligence with no additional payment and to the lines and grades shown on the contract drawings.

3.5 STONE REVETMENT

3.5.1 Excavation and Grading

Where required for bank protection, excavate and grade the existing ground at the proposed structures to provide a foundation for the complete placement of stone. Perform excavation and grading in accordance with Section 31 23 00.00 22 EXCAVATION AND FILL.

3.5.2 Construction Method

Construct the stonefill revetment to the lines, grades, and sections shown or as noted on the drawings.

3.5.3 Placement

Place stone in the revetment by skip or clamshell, cast off barges by hand or machine, or by other methods approved by the Contracting Officer. Distribute the larger stone well throughout the mass, and ensure the finished revetment is free from pockets of small stone and clusters of larger stone. A tolerance of plus or minus 1 foot will be allowed on the prescribed crown elevation and width. Determine the side slopes by the natural angle of repose of the stone, varying from 1V on 1.25H to 1V on 2H.

3.6 CORRECTIVE EARTHWORK

3.6.1 Grading

Grading consists of the sloping of bluff banks damaged by failures in the bank paving and the preparation of the subgrade for placement of new paving; reshaping of damaged drains and constructing new drains; reshaping of overbank areas; and any incidental work as may be required in the

prosecution of the work. Most of the grading will be in areas where mechanical equipment can be used, but some hand grading will be required. Use material resulting from grading operations, including broken pavement, if any, for making fills where required, including the restoration of deficient slopes. Perform all grading and filling to the lines and grades as staked in the field or as specified. Roots, trees, brush, roots, trash and organic materials are prohibited for use in fills. Restored subgrade must be free from roots, brush or other debris; and placed in layers not to exceed 300 mm (1 foot) in thickness. Thoroughly compact each layer to a density at least equal to that of the adjacent undisturbed earth.

3.6.2 Excavation in Failure Areas

Perform excavation in failures where protrusion of stone above adjacent surface is objectionable. Where specified, excavate subgrades 10 to 12 inches below the surface of the adjacent paving. Large areas may not require excavating throughout, but excavation to the depths specified above will be required only for a distance of 5 feet inside the perimeter of the failure. Most of the excavation can be accomplished by mechanical means, but some hand work around the edges will be required. Perform all excavation to the lines and grades as staked in the field or as specified. Use material resulting from the operation for making fills where required as specified in paragraph GRADING. Excess material may be wasted or spread on the adjacent slopes.

3.7 PLACEMENT OF SHORELINE PROTECTION

3.7.1 Debris

Remove any timbers, unsatisfactory material and debris within the reaches for construction except as otherwise directed by the Contracting Officer, and upon removal is the property of the Contractor. Properly dispose of all materials in accordance with the requirements of Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, including any applicable local requirements.

3.7.2 Limitations of Placement Procedures

Stone construction in advance of completed permanent protection except as specified herein is performed at the Contractor's risk.

3.7.3 Armor Stone

Place stone in the locations and at the thickness shown without deviating from the lines and grade shown, including allowance for tolerances. Perform final shaping of the slope concurrently with the initial placement of the stone. Randomly select stones and set in contact with each other so that the interstices between adjacent stones are as small as the character of the stone will permit. Place the face of stone having the largest area against the surface of the underlying material. Begin placement at the bottom of the slope. Place the heaviest stones as toe stones as shown on the contract drawings and as defined by section 2.3.5. Place stones in a manner to avoid displacing underlying materials or placing undue impact force on underlying material that would cause the breaking of stones. Unless otherwise specified, do not drop stone from a height greater than two feet. Use equipment in placing the stone suitable for handling materials of the sizes required including the ability to place the stone over its final position before release and if necessary pick up and reposition the stone. Do not use dragline buckets

and skips in placement. Moving stone by drifting or manipulating down the slope is prohibited. The finished work must be a well distributed mass, free of pockets of either smaller or larger stone, having a minimum of voids and with the maximum of interlocking of stones. It should be anticipated that rehandling of individual stones after initial placement will be required to achieve the above requirements. Do not drop stones required to be placed over or adjacent to drains and subsurface pipes, but gently lower and place in their final position by material handling equipment.

3.7.4 Underlayer Stone

Place stone, to a full zone thickness, in one operation in a manner to avoid displacing the underlying material or placing undue impact force on underlying materials and supporting subsoils. Place underlayer stone in a manner to produce a resultant graded mass of stone with minimum voids. Rearranging of individual stones may be required to achieve this result. Placement by any method which is likely to cause segregation of the various sizes is prohibited. Lower unsegregated stone in a bucket or container and place in a systematic manner directly on the underlying material. Begin placement at the bottom of the slope and proceed upward. Casting or dropping of stone over 2 feet or moving by drifting and manipulating down the slope is prohibited. Construct final finish of the slope as the material is placed.

3.8 TESTS AND INSPECTIONS

3.8.1 Pre-Production

3.8.1.1 Bulk Specific Gravity

Submit, at least 60 calendar days in advance of shipment of stone to the work site, a copy of bulk specific gravity test results for each gradation range of stone proposed to be furnished. Furnish the information prior to preparation of pre-production demonstration stockpiles. Quantity determinations are contingent upon the range of bulk specific gravity (saturated surface dry (SSD) basis) of stone to be supplied. Therefore, during the process of selecting a source or sources of stone for the project, make an investigation to determine the lowest and highest bulk specific gravity (SSD) of stone available at the source or sources proposed to be utilized for each gradation range of stone. Perform tests at a Government approved testing laboratory. Submit testing results in accordance with paragraph SUBMITTALS. Test results which display an extraordinarily wide range of values may necessitate additional testing to determine whether the source contains strata or units with stones of an acceptable range of bulk specific gravity. For Category I sources which have been acceptably tested not more than two years earlier, and the material is of an acceptable quality and bulk specific gravity, the Contracting Officer may waive the requirement for bulk specific gravity testing.

3.8.1.2 Material Quality

Before selecting a source for preparation of a demonstration stockpile, be reasonably certain that the source is capable of meeting the quality and source requirements specified in paragraphs SOURCES and EVALUATION TESTING OF STONE, including their respective subparagraphs.

3.8.2 Placement Control

3.8.2.1 Quality Control Measures

Establish and maintain quality control for all work performed at the job site under this section to assure compliance with contract requirements. Maintain records of the quality control tests, inspections and corrective actions. Cover all construction operations including, but not limited to, the placement of all materials to the slope and grade lines shown and in accordance with this section.

3.8.2.2 Check Surveys

Surveys made by the Contractor are required on each material placed for determining that the materials are acceptably placed in the work. Make checks as the work progresses to verify lines, grades and thicknesses established for completed work. Perform at least one (1) check survey as specified below for each 100 foot section as shown as practicable after completion. Following placement of each type of material, the cross section of each step of the work must be approved by the Contracting Officer before proceeding with the next step of the work. Approval of cross sections based upon check surveys does not constitute final acceptance of the work. Perform cross sections on lines 100 feet apart, measure along the structure reference line, with readings at 20-foot intervals and at beaks along the lines. However, other cross section spacing and reading intervals may be used if determined appropriate by the Contracting Officer. Take additional elevations and soundings as the Contracting Officer may deem necessary. Conduct surveys in the presence of an authorized representative of the Contracting Officer, unless this requirement is waived by the Contracting Officer.

a. Above Water: Determine the elevation of stone above the water surface by the use of a leveling instrument and a rod having a base 12 inches in diameter. If approved by the Contracting Officer other means may also be used.

b. Below Water: For portions of the work that are under water, perform sounding surveys either by means of a sounding pole or a sounding basket weighing about 8 1/2 pounds, each of which has a base measuring 12 inches in diameter.

c. Gage Board: Check the gage prior to any survey. Install a gage board at the project site.

d. Electronic Depth Recorder Method: When using an electronic depth recorder, use the following procedures.

(1) Calibrate and adjust the depth recorder for the gage, with check bar, at least six (6) times within a normal eight (8) hour work day.

(2) Normal calibration times is at the beginning of the work day, mid-morning, close of morning's work, start of afternoon's work, mid-afternoon, and the end of the day.

(3) Perform further calibrations whenever there is any malfunction within the depth recorder or transducer which might affect the soundings, a major gage change, or change in water temperature due to industrial discharge or other causes.

(4) Set the check bar at approximately the deepest sounding in the area to be sounded.

(5) Calibrate the depth recorder to read at low water datum.

(6) When checking the calibration at mid-morning, end of morning, mid-afternoon and end of work, use the same setting used for the previous calibration.

(7) If the calibration check does not agree with the previous calibration, calibrate the depth recorder to the proper setting.

(8) Do not change the setting of the depth recorder between calibrations.

e. Electronic Depth Recorder: The survey depth recorder used must be a standard model acceptable to the Contracting Officer using a sounding chart that can be read directly to the nearest foot and estimated to the nearest tenth (0.1) of a foot. Ensure accuracy is better than 1/2 of 1 percent.

f. Tagline Method of Horizontal Location Along Station: If a tagline is used with a depth recorder, mark the soundings with a fix every 10 feet.

g. Predetermined Transit Angle Method or Ranges Method: The interval between predetermined angles or ranges along a sounding line must not exceed 200 feet along the entire length of the sounding line. Do not allow predetermined angle to form an intersection with the sounding line of less than 45 degrees.

h. Speed of the Sounding Boat: When sounding, ensure the speed of the sounding boat is as constant as possible, preferably between 180 and 220 feet per minute.

i. Checking Gage: Check the gage prior to each calibration and record on the sounding chart or in the field notes.

-- End of Section --