

GENERAL REQUIREMENTS

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SECTION 01110N

SUMMARY OF WORK
02/03

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

The work includes _____ and incidental related work.

Future delivery orders may include and are not limited to the Specification Sections that can be found at <http://www.ccb.org/docs/ufgshome/UFGSToc.htm>

1.1.2 Location

The work shall be located at the Marine Corp Air Station, Beaufort, South Carolina, approximately as indicated. The exact location will be shown by the Contracting Officer.

1.2 EXISTING WORK

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

- a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.
- b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

1.3 LOCATION OF UNDERGROUND FACILITIES

Obtain digging permits prior to start of excavation by contacting the Contracting Officer 15 calendar days in advance. Scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground, pier deck, or paved surface where existing underground utilities or utilities encased in pier structures are discovered. Verify the elevations of existing piping, utilities, and any type of underground or encased obstruction not indicated to be specified or removed but indicated or discovered during scanning in locations to be traversed by piping, ducts, and other work to be conducted or installed. Verify elevations before installing new work

closer than nearest manhole or other structure at which an adjustment in grade can be made.

1.3.1 Notification Prior to Excavation

Notify the Contracting Officer at least 7 days prior to starting excavation work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01140N

WORK RESTRICTIONS

02/03

PART 1 GENERAL

1.1 SPECIAL SCHEDULING REQUIREMENTS

- a. Permission to interrupt any Activity roads, railroads, and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.

1.2 CONTRACTOR ACCESS AND USE OF PREMISES

1.2.1 Activity Regulations

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. Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

1.3.4 Working Hours

Regular working hours shall consist of an 8 1/2 hour period established by the Contractor Officer, Monday through Friday, excluding Government holidays.

1.3.5 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 15 calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress. During periods of darkness, the different parts of the work shall be lighted in a manner approved by the Contracting Officer.

1.3.7 Occupied Building(s)

The Contractor shall be working in an existing buildings or around existing buildings which are occupied. Do not enter the buildings without prior approval of the Contracting Officer.

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

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

Relocate movable furniture approximately 1.8 m (6 feet) away from the Contractor's working area as required to perform the work, protect the furniture, and replace the furniture in their original location(s) upon completion of the work. Leave attached equipment in place, and protect them against damage, or temporarily disconnect, relocate, protect, and reinstall them at the completion of the work.

The Government will remove and relocate other Government property in the areas of the building(s) scheduled to receive work.

1.3.8 Utility Cutovers and Interruptions

- a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."
- b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.
- c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, and compressed air, shall be considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours."
- d. Operation of Station Utilities: The Contractor shall not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer giving reasonable advance notice when such operation is required.

1.4 SECURITY REQUIREMENTS

See the attachment, "GUIDANCE CONCERNING THE CONTRACTED WORKFORCE ON MARINE CORPS INSTALLATIONS" at the end of this section for Marine Corps Air Station Beaufort security requirements.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

From: Commandant of the Marine Corps
To: Distribution

Subj: GUIDANCE CONCERNING THE CONTRACTED WORKFORCE ON
MARINE CORPS INSTALLATIONS

Ref: (a) Integrated Process Team (IPT) Charter of 30 March
2003: Installation Vulnerability as a Result of
Increasingly Contracted Work Force

Encl: (1) Installation Security Access Guidelines

1. Contractors are being called on to provide increasing levels of services at military installations around the world. Furthermore, the Federal Acquisition Regulation and Defense Federal Acquisition Regulation Supplement provide little guidance on the issue of contractor installation access criteria. Per the reference, an IPT was chartered to look at installation vulnerability from a growing contracted workforce and to provide common sense guidelines regarding contractor access.

2. The IPT found that installation access procedures varied greatly from installation to installation. The IPT's goal was to find common ground in the various procedures to adequately address security concerns and to provide the common sense guidance to installations.

3. Enclosure (1) provides suggested installation access guidelines for contractor employees including those employed by Public/Private Ventures. This guidance should only be used at installations located in the United States and its Territories. For areas outside the United States and its Territories, contract organizations and security professionals should address access procedures in accordance with treaties, Status of Forces agreements and foreign laws. This guidance is prospective in nature. It is not recommended that the guidance be unilaterally forced into any existing contracts. It is recommended that contracting officers and security forces include the guidelines found in enclosure (1) in new solicitations and contracts to be performed by contractor personnel on Marine Corps installations. The guidelines may be tailored to meet individual installation access security needs.

4. Nothing provided in these guidelines is intended to limit the Installation Commander's or delagatee's authority to deny or withdraw access privileges from contractor personnel for credible reasons. However, this authority must not be exercised in an arbitrary or capricious manner. Removal or denial actions must be based on reasonable grounds and be judiciously applied.

5. Contractor personnel are vital to the success of the Marine Corps. Applying a common sense approach to identifying, screening and credentialing these personnel is imperative. POC for questions regarding this guidance is CAPT Mike O'Connor, CEC, USN, HQMC, LFF DSN 225-9446.

R. L. KELLY

Installation Security Access Guidelines

1. These suggested guidelines only apply to individuals performing work on Marine Corps installations pursuant to a Government contract (contractor employees). These guidelines do not apply to U.S. Military, U.S. Civil Service or Non-Appropriated Fund employees.

2. **Access:** Installation access is generally broken down into four general categories:

a. **Day/Visitor access (other than contractor employees):** issued for periods of less than 30 days for visits of short duration (e.g. family visits, sporting events and business meetings like pre-proposal conferences). Contractors should not use daily access procedures to circumvent background check requirements. Day/visitors should have:

1) an installation sponsor request forwarded to Provost Marshall office,

2) valid form of Federal or State government I.D.

3) if driving a motor vehicle, a valid driver's license, vehicle registration and proof of insurance. Passes should be renewed daily.

b. **Not regularly scheduled delivery access:** This category poses the greatest force protection threat to our installations and is the most difficult to regulate without impacting operations. Delivery personnel requiring access should submit all items listed in 2.a. Additionally, security personnel should inspect delivery vehicles. Installations, if possible, should process deliveries through an installation access point other than the main gate to ease traffic and facilitate thorough vehicle inspections.

c. **Business access:** issued for contractor employees requiring access for periods from 1 day to 1 year. Regularly scheduled delivery personnel (e.g., FEDEX, UPS) should also follow the business access guidelines described below. Personnel requiring business access should submit all items listed in 2.a., as well as proof of employment on a valid Government contract (e.g. a letter from the prime contractor including contract number and term) and proof of an employee background check within the past year covering the previous 2 years. Contractor employee background checks are conducted at contractor expense. The background check:

1) Must establish the employee's citizenship or legal alien status. Acceptable documents include birth certificate, Immigration and Naturalization Service (INS) forms and passports.

2) Must include proof of a criminal records check from the state covering the employee's previous two years of residence (or

length of legal residence for foreign nationals in the U.S. for less than 2 years).

Note: State laws on access to background information vary greatly from state to state. Counsel must be consulted before establishing more stringent requirements for background checks.

3) will be subject to government verification: Installation security representatives should implement a program to randomly screen Contractor submissions through the FBI National Crime Information Center (NCIC) Interstate Identification Index (III) system using the code "C" as the purpose code and protection of a Federal facility as justification. All NCIC III checks must be followed by the submission of fingerprint records to the FBI Automated Fingerprint Identification System (AFIS) database.

d. **Permanent access:** issued for periods of 1 to 3 years. Personnel requiring more permanent access should submit all items listed in 2.a and 2.c. above and the installation should perform an NCIC check and fingerprint all contractor employees at government expense. Contractor employees employed for periods greater than 1 year should have their contractor provided background checks reevaluated annually.

3. **Denial of Access:** Access may be denied if during any background check it is determined that an employee:

a. is on the National Terrorist Watch List.

b. is illegally present in the United States.

c. is subject to an outstanding warrant.

d. has knowingly submitted an employment questionnaire with false or fraudulent information.

e. has been issued a debarment order and is currently banned from military installations.

4. These access guidelines will be provided to cognizant Marine Corps Contracting Officers for the use in development of special contract provisions of all future Marine Corps contracts. Installation commanders will also make dissemination of these guidelines to those agencies who may award future contracts that may be performed on Marine Corps installations.

SECTION 01150N

SPECIAL PROJECT PROCEDURES

02/03

PART 1 GENERAL

Not used.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 HAZARDS TO AIRFIELD OPERATION

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

3.1.1 Work in Proximity to Runways

Accomplish all construction work on the runways, taxiways, and parking aprons and in the end zones of the runways and 23 m (75 feet) to each side of the runways and taxiways with extreme care regarding the operation of aircraft. Cooperate closely, and coordinate with the Operations Officer and the Contracting Officer. Park equipment in an area designated by the Contracting Officer. Under no circumstances shall equipment be parked overnight or for any extended period of time in the proximity of the runways or taxiways. Leave no material in areas where extreme care is to be taken regarding the operation of aircraft.

3.1.2 Schedule of Work/Aircraft Operating Schedules

Schedule work to conform to aircraft operating schedules. The Government will exert every effort to schedule aircraft operations so as to permit the maximum amount of time for the Contractor's activities; however, in the event of emergency, intense operational demands, adverse wind conditions, and other such unforeseen difficulties, the Contractor shall discontinue operations at the specified locations in the aircraft operational area for the safety of the Contractor and military personnel and Government property. Submit a schedule of the work to the Contracting Officer for transmittal to the Operations Officer describing the work to be accomplished; the location of the work, noting distances from the ends of runways, taxiways and buildings and other structures as necessary; and dates and hours during which the work is to be accomplished. Keep the approved schedule of work current, and notify the Contracting Officer of any changes prior to beginning each day's work.

3.1.3 Daytime Markings

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

3.1.4 Nighttime Markings

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

3.1.5 Excavation

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

3.1.6 Contractor Safety Precautions

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

3.1.7 Radio Contact

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

-- End of Section --

SECTION 01200N

PRICE AND PAYMENT PROCEDURES
09/98

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.

CORPS OF ENGINEERS (COE)

COE EP-1110-1-8 (1997) Construction Equipment Ownership and Operating Expense Schedule

1.2 CONTRACT MODIFICATIONS

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

1.3 CONTRACTOR'S INVOICE

1.3.1 Content of Invoice

Requests for payment will be processed in accordance with the Contract Clause "FAR 52.232-27, Prompt Payment Construction Contracts."

- a. The Contractor's invoice certified by QC, on the form furnished by the Government for this purpose, showing in summary form, the basis for arriving at the amount of the invoice. Submit original and five copies.
- b. Updated Monthly Schedule with Earned Value Report, three copies. See Section 01321, "Network Analysis Schedules," for Monthly Schedule and Earned Value Report requirements.
- c. Final invoice shall be accompanied by Final Release Form.

1.3.2 Mailing of Invoices

- a. All invoices shall be forwarded with specific marking on the envelope. This marking shall be in the front lower left hand corner, in large letters, "INVOICES - ENCLOSED."

- b. Invoices not completed in accordance with contract requirements will be returned to the Contractor for correction of the deficiencies.
- c. Final invoices not accompanied by Final Release Form will be considered incomplete and will be returned to the Contractor.

1.4 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests by the Contractor and will be subject to reduction for overpayments or increase for underpayments on preceding payments to the Contractor.

1.4.1 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 the following:

- 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. Record drawings not current as stated in Clause "FAC 5252.236-9310, Record Drawings."

1.4.2 Payment for Materials Offsite

Payments may be made to the Contractor for materials stored off construction sites under the following conditions:

- a. Conditions described in the paragraph entitled "Payments to the Contractor";
- b. Material within a distance of 80 km (50 miles) by streets and roads to the construction site;
- c. Materials adequately insured and protected from theft and exposure;
- d. Materials not susceptible to deterioration or physical damage in storage or in transit to the job site are acceptable for progress payments. Items such as steel, machinery, pipe and fittings, and electrical cable are acceptable; items such as gypsum wallboard, glass, insulation, and wall coverings are not;

- e. 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 --

SECTION 01310N

ADMINISTRATIVE REQUIREMENTS

09/03

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. 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 01332 "Construction Submittal Procedures".

SD-01 Preconstruction Submittals

List of contact personnel;G

1.2 MINIMUM INSURANCE REQUIREMENTS

Procure and maintain during the entire period of performance under this contract the following minimum insurance coverage:

- a. Comprehensive general liability: \$500,000 per occurrence
- b. Automobile liability: \$200,000 per person, \$500,000 per occurrence for bodily injury, \$20,000 per occurrence for property damage
- c. Workmen's compensation as required by Federal and State workers' compensation and occupational disease laws.
- d. Employer's liability coverage of \$100,000, except in States where workers compensation may not be written by private carriers,
- e. Others as required by the state of South Carolina.

1.3 CONTRACTOR PERSONNEL REQUIREMENTS

1.3.1 Subcontractors and Personnel

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. Also see Section 01140 for additional requirements.

1.3.2 Identification Badges

Identification badges, if required, will be furnished without charge. Application for and use of badges will be as directed. Immediately report instances of lost or stolen badges to the Contracting Officer.

1.3.3 Subcontractor Special Requirements

1.3.3.1 Asbestos Containing Material

All contract requirements of Section 13281, "Engineering Control of Asbestos Containing Materials" assigned to the Private Qualified Person (PQP) shall be accomplished directly by a first tier subcontractor.

1.3.4 Contractor Personnel Requirements

1.3.4.1 Personnel List

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

- a. Name
- b. Date and place of birth
- c. Citizenship
- d. Home address
- e. Social security number
- f. Naturalization (or Alien Registration number
- h. Passport number, place of issue, and expiration date

The request for personnel passes shall be accompanied with the following certification:

"I hereby certify that all personnel on this list are either born U.S. citizens, naturalized U.S. citizens with the naturalization number shown, or legal aliens with the alien registration number indicated."

Signature/Firm Name

1.4 SUPERVISION

Have at least one qualified supervisor capable of reading, writing, and conversing fluently in the English language on the job site during working hours. In addition, if a Quality Control (QC) representative is required on the contract, then that individual shall also have fluent English communication skills.

1.5 PRECONSTRUCTION CONFERENCE

After award of the contract but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule prices, shop drawings, and other submittals, scheduling programming, and prosecution of the work. Major subcontractors who will engage in the work shall also attend.

1.6 PARTNERING

LEVEL B PARTNERING: To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership with the Contractor and its subcontractors. Key personnel, including the client who will occupy the facility, the designer-of-record, principal individuals from the Engineering Field Division (EFD) or Engineering Field Activity (EFA) and from the Resident Officer in Charge of Construction (ROICC) office, the project sponsor, and representative(s) of the facility owner will be invited to participate in the partnering process. Key members of the prime and subcontractors teams, including senior management, must participate. The partnership will draw on the strength of each organization in an effort to achieve a quality project done right the first time, within budget, on schedule, and without any safety mishaps. The initial session will be one-day and the follow-on session(s), held at a minimum of once every three months or as agreed to by the partners, will be half-day. The partnering sessions shall be held at locations agreed to by the partners. A Government in-house facilitator (a trained facilitator from an EFD or EFA, another ROICC office or another Government agency) will facilitate the partnering sessions. The contractor shall pay all costs associated with the partnering effort including meeting room and other incidental items. Before the partnering session, the contractor shall coordinate with the facilitator requirements for incidental items (audio-visual equipment, two easels, flipchart paper, colored markers, note paper, pens/pencils, colored flash cards, etc.) and have these items available at the partnering session. The contractor will copy documents for distribution to all attendees. The participants shall bear their own costs for meals, lodging and transportation associated with partnering. Partnering shall apply to each task order awarded under this contract.

1.6 AVAILABILITY OF CADD DRAWING FILES

After award and upon request, the electronic "Computer-Aided Drafting and Design (CADD)" drawing files will be made available to the Contractor for use in preparation of construction data related to the referenced contract subject to the following terms and conditions.

Data contained on these electronic files shall not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor shall make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor shall, 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 CADD drawing files are not construction documents. Differences may exist between the CADD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CADD files, nor does it make representation to the compatibility of these files with the Contractors hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished CADD files, the signed and sealed construction documents shall govern. The Contractor is responsible for determining if any conflict exists. Use of these CADD 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 and/or modifies these electronic CADD files for use in producing construction data related to this contract, all previous indicia of ownership (seals, logos, signatures, initials and dates) shall be removed.

1.7 ELECTRONIC MAIL (E-MAIL) ADDRESS

The Contractor shall establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments in Microsoft, Adobe Acrobat, and other similar formats. Within 10 days after contract award, the Contractor shall 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, terrorist threats, etc. Multiple email address will 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). The Contractor shall promptly notify the Contracting Officer, in writing, of any changes to this email address.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

SECTION 01321N

NETWORK ANALYSIS SCHEDULES
09/01

PART 1 GENERAL

1.1 DESCRIPTION

Provide a computerized critical path method (CPM) schedule that includes proposed design, procurement, construction and testing activities. The schedule shall cover the time from Contract Award/Notice to Proceed to the Contract completion date. The schedule shall incorporate Engineering Design activities and submittals, construction activities (including major material/equipment deliveries), resource loading/allocation, and cost information and quality control. Additional detail regarding required content is found later in this Section. The principles and definitions of the terms used herein shall be as set forth in Contract Clause "FAR 52.236-15, Schedules for Construction Contracts". However, the provisions of this Section shall govern.

1.2 SUBMITTALS

Submit the following in accordance with Section 01332 "Construction Submittal Procedures".

SD-01 Preconstruction Submittals

Preliminary Network Analysis Schedule; G OIC

Baseline Network Analysis Schedule; G OIC

Network Analysis Schedule updates; G OIC

1.3 SCHEDULE ACCEPTANCE

The Network Analysis Schedule will be submitted and accepted in two stages: The Preliminary Network Analysis Schedule shall be presented at the Post Award Kickoff (PAK) Meeting and the Baseline Network Analysis Schedule shall be included with the 100% Design Submittal Package. Review comments made by the Government on the Contractor's Network Analysis Schedule submittals will not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for scheduling, sequencing, and prosecuting the work to comply with the requirements of the Contract Documents.

1.3.1 Schedule Acceptance Prior to Start of Work

The Contractor shall not start construction work on any definable feature of work until the Network Analysis Schedule detailing that portion of work has been accepted by the Government.

1.3.2 Use of the Network Analysis Schedule

The Network Analysis Schedule shall be used by the Contractor for planning, organizing, and directing the work; reporting progress; quality control management and requesting payment for work accomplished. The schedule shall be updated monthly by the Contractor and Government representative, and submitted monthly with the progress pay request to reflect the current status of the work. This requirement applies to both the Preliminary and Baseline schedules. The submittal and acceptance of the Network Analysis Schedule and accurate updated schedules accompanying the pay requests are both conditions precedent to processing pay requests. Submittal of the Network, and subsequent schedule updates, will be understood to be the Contractor's representation that the submitted schedule meets all of the requirements of the Contract Documents, accurately reflects the work accomplished, and that Work will be executed in the sequence indicated on the submitted schedule.

1.4 SOFTWARE

The Contractor shall use the current version of the SureTrak Software by Primavera Systems, Inc, that shall be capable of operating in a Windows environment. If the Contractor chooses to use an equally capable program, the Contractor shall convert all data into Primavera Machine Readable Format (Lotus, D-Base, Excel, etc) prior to submission of all schedule inputs, including but not limited to the Preliminary schedule, Baseline schedule, **network analysis updates**, and changes to the schedule. Submit all required **network analysis** submissions and updates on 90mm (3-1/2 inch) double sided, high-density disks or CD-ROM, and/or via electronic mail, at the discretion of the Contracting Officer. The electronic submittal requirements shall be in addition to any hard copy submittal required.

1.5 NETWORK SYSTEM FORMAT

The system shall consist of CPM (Critical Path Method) time scaled network logic diagrams and accompanying reports. Facilities or phases with separate and distinct start and/or completion dates shall be identified by separate networks.

The Network Analysis Schedule shall be formatted and submitted in two stages separated by the milestone of Final Design Acceptance. The first stage of the Schedule is the Preliminary Network Analysis Schedule and the second stage of the Schedule is the Baseline Network Analysis.

1.5.1 Preliminary Network Analysis Schedule Submittal Format

The Preliminary Network Analysis submittal shall include Detailed Schedule Diagrams and Detailed Schedule Data as described below for all design activities, Government reviews and preliminary construction activities planned for execution during design development. Also provide Outline Schedule Diagrams and Outline Schedule Data as

described below for the time from acceptance of the Final Design to the Contract Completion Date.

1.5.2 Baseline Network Analysis Schedule Format

The Baseline Network Analysis submittal shall include Detailed Schedule Diagrams and Detailed Schedule Data as described below for all remaining construction activities through the Contract Completion Date. The Baseline Network Analysis shall be a complete contract schedule incorporating the detailed activities from the Preliminary schedule and providing full detail for all construction activities as described in this Section.

1.5.3 Outline Schedule Diagrams

Show the sequence, order, and interdependence of major construction milestones and activities. Include ordering and procurement of major materials and equipment, long-lead items, and key milestones identified by the contract.

1.5.4 Outline Schedule Data

Use a standard calendar of 5 workdays per week, Monday through Friday, with contractor defined holidays and Federal holidays shown as non-workdays. Provide a description of each major construction activity or key milestone. Include any construction phasing required by the contract.

1.5.5 Detailed Schedule Diagrams

Show activity number, description, early dates, float, and all relationships (i.e. logic ties), resources and costs. Show the sequence, order, and interdependence of activities in which the work is to be accomplished. The basic concept of a network analysis diagram will be followed to show how the start of a given activity is dependent on the physical completion of preceding activities and how its physical completion restricts or restrains the start of following activities. Include allowance for Government processing, approval and return of submittals, samples and shop drawings where Government approval is required.

In addition to construction activities, detailed network activities shall include the submittals, procurement, and Government activities impacting progress:

- a. Submittal activities shall include review and approval of all submittals. If the Government's action on any submittal is "Disapproved" or "Revise and Resubmit", a new series of submittal preparation activities shall be inserted into the schedule. Predecessor for the new submittal preparation activity will be the original approval activity and the successor of the new approval activity will be the fabrication/deliver activity for the equipment or material.

- b. Procurement activities shall include all materials and equipment, receipt of materials with estimated procurement costs of major items for which payment of materials will be requested in advance of installation, fabrication of special material and equipment, and their installation and testing.
- c. Show activities of the Government that affect progress and contract-required dates for completion of all or parts of the work. Show activities indicating Government furnished materials and equipment utilizing delivery dates indicated in the clause titled "Government Furnished Property (Fixed-Price Contract)" of the Contract Clauses.

1.5.6 Detailed Schedule Data

The schedule data shall conform to the following criteria:

- a. All activities shall use a standard calendar of 5 workdays per week, Monday through Friday. Show Contractor defined holidays and Federal holidays as non-workdays. Activities using any other calendar shall be highlighted for the Contracting Officer's approval.
- b. Each schedule activity shall be cost and resource loaded to include each type of trade or labor, e.g., carpenters, plumbers, electricians, etc. Activity duration shall be in workdays. All activities shall indicate the average number of workers per day planned during execution of the activity.
- c. At a minimum, each schedule activity shall contain codes by:
 - 1. Responsibility; include but not be limited to Government Furnished Materials, Contractor/Subcontractor, Supplier/Vendor, Consultant, etc.
 - 2. Location; such as, building specific, phases of construction and/or areas within a building.
 - 3. Contract Specification Section (i.e. Construction Specification Institute (CSI) Division.
 - 4. Request of the Contracting Officer; additional codes may be required such as phases, buildings, and areas within a building.
- d. Key milestones as identified by contract or furnished by the Contracting Officer.
- e. All non-procurement activities must be less than or equal to 20 workdays unless approved to be greater by the Contracting Officer.
- f. Detailed description of each activity (e.g., "install plumbing and bath fixtures" versus "install fixtures");

"install conduit", "install wiring, etc," versus "electrical"). In each activity, give quantity and unit of measure so that the amount of work the activity involves is clearly communicated.

- g. Only two (2) open-ended activities are allowed; the first and last activities.
- h. Three phases of control (Preparatory, Initial, and Follow-up) must be included in the schedule for each activity identified as a Definable Feature of Work by the Contracting Officer (See Quality Control Plan).
- i. The use of imposed constraints is discouraged. Constraints cannot override logic. Constraints shall only be used for "Project Start," "Project Completion," "Project Milestones" and "Government equipment/material delivery." The rationale for the use of a constraint, other than for the items noted, should be recorded in the activity's log field. Mandatory constraints (start and finish) violate network logic and shall not be used. If absolutely necessary, use early or late constraints instead. Any imposed constraints must be specifically highlighted for Contracting Officer's approval.
- j. Out of sequence progress if applicable shall be handled through Retained Logic, not the Default Option of Progress Override.
- k. Progress shall be calculated based on percent complete.
- l. All changes to activities shall be recorded with a note in the activity log field. The log shall include, as a minimum, the date and reason for the change, as well as the government representative granting approval for the change.
- m. The use of resource leveling, either manual or automatic, is discouraged. Any resource leveling must be specifically highlighted for the Contracting Officer's approval.

1.5.7 Schedule Requirements for HVAC TAB

The fieldwork for HVAC Testing/Adjusting/Balancing shall be broken down in the Earned Value Report by separate line items that reflect measurable deliverables. Specific payment percentages for each line item shall be determined on a case-by-case basis for each contract. The line items shall be as follows:

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

- b. Approval of the pre-field engineering report: The TABS Agency submits a report that outlines the scope of fieldwork. The report shall contain details of what systems will be tested, procedures to be used, sample report forms for reporting test results and a quality control checklist of work items that must be completed before TABS field work commences.
- c. Season I field work: Incremental payments are issued as the TABS field work progresses. The TABS Agency mobilizes to the project site and executes the fieldwork as outlined in the pre-field engineering report. The HVAC water and air systems are balanced and operational data shall be collected for one seasonal condition (either summer or winter depending on project timing).
- d. Approval of Season I report: On completion of the Season I field work, the data is compiled into a report and submitted to the Government. The report is reviewed, and approved, after ensuring compliance with the pre-field engineering report scope of work.
- e. Completion of Season I field QA check: Contract QC and Government representatives meet the TABS Agency at the job site to retest portions of the systems reported in the Season I report. The purpose of these tests is to validate the accuracy and completeness of the previously submitted Season I report.
- f. Approval of Season II report: The TABS Agency completes all Season II field work, which is normally comprised mainly of taking heat transfer temperature readings, in the season opposite of that under which Season I performance data was compiled. This data shall be compiled into a report and submitted to the Government. On completion of submittal review to ensure compliance with the pre-field engineering report scope, progress payment is issued. Progress payment is less than that issued for the Season I report since most of the water and air balancing work effort is completed under Season I.

1.6 SUBMISSION AND APPROVAL

At the Post Award Kickoff (PAK) Meeting as described in Section 01006, the Contractor shall participate in a meeting to present and discuss the proposed Preliminary Network Analysis Schedule and requirements of this section. Within 7 calendar days after the PAK Meeting, the contractor shall submit the Preliminary Network Analysis Schedule corrected to incorporate the comments and discussions of the PAK Meeting. Submit the Baseline Network Analysis with the 100% Design Submittal. Upon submission, the Government will schedule a mandatory one-day Baseline Schedule Finalization Session (BSFS) together with the contractor to review, edit and finalize the Baseline Network Analysis. Revisions necessary as a result of this review shall be

resubmitted for approval of the Contracting Officer within five (5) working days of the BSFS. Once the completed network has been approved by the Contracting Officer, the Contractor shall within 7 calendar days furnish the approved schedule on one 90 mm diskette or CD-ROM as described in paragraph entitled "Software". The original approved Baseline Network Analysis Schedule shall be used as the working schedule for construction and will be the baseline against which all payments and changes will be analyzed. It shall be used by the Contractor for planning, organizing, and directing the work, reporting progress, and requesting payment for work accomplished.

1.6.1 Deliverables:

- a. Submit a CPM time-scaled logic diagrams on 610 by 914 mm (24 x 36 inches) sheets with the required schedule reports and one 90 mm diskette or CD-ROM, showing all activities in the contract.
- b. A tabular schedule report sorted by predecessor and successor.
- c. A graphical schedule report sorted by Total Float, Early Start.
- d. A schedule report listing Government responsibility activities sorted by Early Start.
- e. An Earned Value Report listing all activities having a budget amount and cost sorted first by resource then by activity.
- f. Early project completion: In the event the project schedule proposes completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support to support the Contractor's "early" completion. If early completion is approved by the Contracting Officer, each of the accelerated activities will be addressed at each regular schedule update. A contract modification is required if the completion date is changed.

1.6.2 Changes to the Network Analysis System

If changes in the Contractor's means and methods are necessary, apart from contract modifications (sequencing/logic, duration, further refining of schedule activities and logic, etc.), the Contracting Officer shall be notified in writing stating the reasons for the change. The Network Analysis Schedule shall be revised and submitted without additional cost to the Government on a 90 mm diskette or CD-ROM showing impact of the change.

1.6.3 Biweekly Work Schedule

To provide a more detailed day-to-day planning of upcoming work, the Contractor shall prepare and issue detailed work plans that coordinate with and supplement the above defined network analysis. The work plans shall be keyed to the CPM activity numbers and shall be submitted each week and shall show the projects activities that will occur during the following two-week interval. Additionally, the critical path activities are to be identified on the Biweekly Work Plan. The detail work plans are to be bar chart type schedules prepared by the Contractor in sufficient detail to define the work to be accomplished, the crews, construction tools and equipment to be used during the current and next two-week interval. The bar charts shall be formatted to allow reproduction on 8 1/2 by 11 sheets. Three copies of the bar chart schedules shall be delivered to the Contracting Officer not less than 3 work hours prior to the start of the biweekly coordination meeting.

1.6.4 Biweekly Coordination Meeting

In conjunction with the receipt of the Biweekly Work Schedule, a coordination meeting shall be held each week at a location determined by the Contracting Officer to discuss the work schedule. The Contractor shall make a presentation of the previously submitted and current Biweekly Work Schedule to the Contracting Officer so as to provide an overview of the project's schedule and provide an opportunity to discuss items of coordination. Consideration of materials, crews, and equipment shall be addressed to ascertain their respective availability. The meeting shall identify actions necessary to provide adherence to the Biweekly Work Schedule and the overall network for the project defined above. The Contractor shall take meeting minutes. All meeting minute entries shall be keyed to the schedule activity number(s) being addressed. Within one day of the meeting, the Contractor shall provide a draft copy of the meeting minutes to the Contracting Officer for review and comment. Final copies of the minutes containing the comments provided by the Contracting Officer shall be issued within 3 days of the meeting.

1.6.5 Monthly Schedule Update/Progress Meetings

Progress meetings to discuss progress and payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the PAK Meeting. During the meeting the Contractor shall describe proposed revisions and adjustments required reflecting the current status of the project for the Contracting Officer's approval.

1.6.6 Monthly Schedule Updates

Not more than 4 working days after the monthly update meetings, the Contractor shall submit a 90-mm diskette or CD-ROM containing an updated schedule of actual construction progress by updating started and completed activities and remaining duration. Unilateral and conformed modifications shall be included in the schedule update. Initially, and monthly thereafter, provide the following reports in addition to the 90 mm diskette or CD-ROM:

- a. A time-scaled logic diagram of the network showing the critical path and progress reflecting the current completion date on 610 by 914 mm (24 by 36-inch) sheets. Updated diagrams shall show the date of the latest revision.
- b. Cost summary report and an Earned Value Report listing all activities having a budget amount.
- c. 30 calendar days look-ahead report.
- d. Schedule report grouped by total float and sorted by Early Start containing all uncompleted schedule activities.
- e. Written narrative report describing current status and identifying potential delays. The report should include as a minimum the following entries:
 1. State whether the contract is on schedule, ahead or behind schedule (stated in the number of calendar days) based on the approved contract schedule. If the schedule indicates that any contract milestone dates will not be met, the Contractor shall also submit either a detailed recovery plan that shall put the project back on schedule, or a request for time extension with justification as set forth in paragraph titled "Time Extensions."
 2. Comment on the project's current critical path. Indicate if it remained the same as the previous 30 calendar days, or if it shifted. Comment on activities and progress that could change the critical path. Discuss current and anticipated scheduling problems.
 3. Comment on any anticipated problems in attaining late start or late finish of activities.
 4. List all changes made since the previous period and relate each change to document the approved schedule changes.
 5. Comment on Government responsibility activities utilizing the Responsibility Code.

1.6.6.1 Mechanism for Monthly Schedule Updates

Default Progress Data Disallowed: Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in the CPM scheduling software system. Actual Start and Actual Finish dates on the CPM schedule shall match the dates provided from Contractor Quality Control and Production Reports. These reports will be the sole basis for updating the schedule. Work activities will be updated by actual work progression rather than being cash flow driven. Actual labor and equipment hours used on activities will be derived from the daily reports.

1.7 USE OF NETWORK ANALYSIS SCHEDULE FOR PROGRESS PAYMENTS

The Approved Project Schedule shall be used to measure the progress of the work and provide the basis of all progress payments. Monthly progress payments shall be based upon information developed at the monthly Schedule Update. The computer-produced Cost Report shall be utilized for verification of the progress payment. The Contracting Officer shall have the right to withhold any and all progress payments until receipt of an updated schedule.

1.8 CONTRACT MODIFICATION

When a contract modification to the work is required, submit the proposed revisions to the network with a fragnet and a cost proposal for each proposed change. All modifications shall be incorporated into the network analysis system as separately identifiable activities broken down and inserted appropriately on the first update following issuance of a directive to proceed with the change. All revisions to the baseline schedule activities that are necessary to further refine the schedule so that the changed work activities can be logically tied to the schedule shall be made. Financial data shall not be incorporated into the schedule until the contract modification is signed by the Contracting Officer.

1.9 FLOAT

Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to government caused delay), special lead/lag logic restraints, zero total or free float constraints, extended activity times, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the project schedule or its updates. The use of Resource Leveling (or similar software features) used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

1.9.1 Definitions of Float or Slack

Free Float is the length of time the start of an activity can be delayed without delaying the start of a successor activity. Total Float is the length of time along a given network path that the actual start and finish of activity(s) can be delayed without delaying the project completion date.

1.9.2 Ownership of Float

Float available in the schedule at any time shall not be considered for the exclusive use of either the Government or the Contractor. During the course of contract execution, any float generated due to the efficiencies of either party is not for the sole use of the party generating the float; rather it is a shared commodity to be reasonably used by either party.

1.9.3 Negative Float

Negative float shall not be a basis for requesting time extensions. Any extension of time shall be addressed in accordance with the Paragraph "Time Extensions". Scheduled completion date(s) that extend beyond the contract or phase completion date(s) (evidenced by negative float) may be used in computations for assessment of payment withholdings. The use of this computation is not to be construed as a means of acceleration.

1.10 TIME EXTENSIONS

Extension of time for performance required under the contract clauses titled, "Changes", "Differing Site Conditions", "Default (Fixed-Price Construction)" or "Suspension of Work" shall be granted only to the extent that equitable time adjustments for the activity or activities affected exceed the total float along the network paths involved. As a minimum, time extension requests shall contain:

- a. A descriptive summary of the changes
- b. Analysis of project impact
- c. A fragnet that shows the impacted activities before the change
- d. A fragnet that shows the impacted activities after the change

Time extensions shall not be considered for contract modification proposals that do not include full documentation for the schedule change. Once a change has been approved by the Contracting Officer, the specific activities and the overall schedule must be updated.

1.11 CORRESPONDENCE AND TEST REPORTS

All correspondence (e.g., letters, Requests for Information (RFIs), electronic mail transmissions, meeting minutes, Production and QC Daily Reports, material delivery tickets, photographs, etc.) shall reference the Schedule Activity Number(s) that is (are) being addressed. All test reports (e.g., concrete, soil compaction, weld, pressure, etc.) shall reference the Schedule Activity Number(s) that is (are) being addressed.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01322N

WEB BASED CONSTRUCTION MANAGEMENT (WEBCM)
02/03

PART 1 GENERAL

1.1 DESCRIPTION

The Government and Contractor shall utilize the Naval Facilities Engineering Command's (NAVFAC) WebCM system for electronic submittal of all data and documents (unless specified otherwise by the Contracting Officer) throughout the duration of the Contract. WebCM is a web-based electronic media site that is hosted by Primavera Systems, Inc. utilizing their PrimeContract (hereinafter referred to as WebCM) web solution and will be made available only to key Prime Contractor personnel and QC Specialist personnel working for subcontractors and the Designer of Record. The joint use of this system is to facilitate; electronic exchange of information, key processes, and overall management of the contract. WebCM shall be the primary means of project information submission and management. When required by the Contracting Officer, paper documents will also be provided (i.e.; e.g. the signature of Contract Modifications and submission of Contract Claims). In the event of discrepancy between the electronic version and paper documents, the paper documents will govern.

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1.2 USER ACCESS LIMITATIONS

The Contracting Officer will control the Contractor's access to WebCM by allowing access and assigning user profiles to accepted Contractor personnel. User profiles will define levels of access into the system; determine assigned function-based authorizations (determines what can be seen) and user privileges (determines what they can do). Sub-contractors and suppliers will not have direct access to WebCM. Entry of information exchanged and transferred between the Contractor and its Designer of Record, sub-contractors and suppliers on WebCM shall be the responsibility of the Contractor.

1.2.1 Joint Ownership of Data

Data entered in a collaborative mode (entered with the intent to share as determined by permissions and workflows within the WebCM system) by the Contracting Officer and the Contractor will be jointly owned.

1.3 AUTOMATED SYSTEM NOTIFICATION AND AUDIT LOG TRACKING

Review comments made (or lack thereof) by the Government on Contractor submitted documentation shall not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for managing, tracking, and documenting the Work to comply with the requirements of the Contract Documents. Government acceptance via automated system notifications or audit logs extends only to the face value of the submitted documentation and does not constitute validation of the Contractor's submitted information.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. 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 01332 CONSTRUCTION SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of Contractor's key WebCM personnel.

Include descriptions of key personnel's roles and responsibilities for this project.

1.5 COMPUTER REQUIREMENTS

The Contractor shall use computer hardware and software that meets the requirements of the WebCM system as recommended by Primavera Systems, Inc. to access and utilize WebCM. As recommendations are modified by Primavera, the Contractor will upgrade their system(s) to meet the recommendations or better. Upgrading of the Contractor's computer systems will not be justification for a cost or time modification to the Contract.

1.6 CONTRACTOR RESPONSIBILITY

The Contractor shall be responsible for the validity of their information placed in WebCM and for the abilities of their personnel. Accepted users shall be knowledgeable in the use of computers, including Internet Explorer, e-mail programs such as Outlook, word processing programs such as Word, spreadsheet programs such as Excel, and Adobe Portable Document Format (PDF) document distribution program. The Contractor shall utilize the existing forms in WebCM to the maximum extent possible. If a form does not exist in WebCM and the Contractor must include as an attachment or by uploading the data file, PDF documents will be created through electronic conversion rather than optically scanned. The Contractor is responsible for the training of their personnel in the use of WebCM and the other programs indicated above as needed. All costs associated with the use of this system will be evenly distributed in the project overheads and spread across the duration of the contract; a separate cost line item will not be allowed.

1.6.1 User Access Administration

Provide a list of Contractor's key WebCM personnel for the Contracting Officer's acceptance. Notify the Contracting Officer immediately of any users that are to have access removed. Resubmit the personnel list whenever modified. User changes will take effect within 1 one working day of accepting the requested change. The Contracting Officer reserves the right to perform a security check on all potential users. The Contractor will be allocated 5 key personnel with access to WebCM. Access will include 2 key personnel from the Designer of Record and one access for each QC Specialist while they are performing their duties, per Specification Section 01450.

1.7 CONNECTIVITY PROBLEMS

WebCM is a web-based environment and therefore subject to the inherent speed and connectivity problems of the Internet. The Contractor is responsible for its own connectivity to the Internet. WebCM response time is dependent on the Contractor's equipment, including processor speed, modem speed, Internet access speed, etc. and current traffic on the Internet. The Government will not be liable for any delays associated from the usage of WebCM including, but not limited to: slow response time, down time periods, connectivity problems, or loss of information. Under no circumstances shall the usage of the WebCM be grounds for a time extension or cost adjustment to the contract.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 WEBCM UTILIZATION

WebCM shall be utilized in connection with submittal preparation and information management required by Section 01321 "Network Analysis Schedules" (NAS), Section 01332, "Submittal Procedures", Section 01450, "Quality Control," and other Division One sections. Requirements of this section are in addition to requirements of all other sections of the specifications.

3.1.1 Not Used

3.1.2 Shop Drawings

Shop drawing and design data documents shall be submitted as PDF attachments to the WebCM submittal workflow process and form. All PDF shop drawing submittal documents shall have the Contractor's review and submittal stamp (including signatures) as specified in Section 01332, "Submittal Procedures" the same as if submitted as hard copy. Examples of shop drawings include, but are not limited to:

- a. Standard manufacturer installation drawings.

- b. Drawings prepared to illustrate portions of the work designed or developed by the Contractor.
- c. Steel fabrication, piece, and erection drawings.

3.1.3 Product Data

Product catalog data and manufacturers instructions shall be submitted as PDF attachments to the WebCM submittal workflow process and form, except that color charts and similar color oriented pages shall be submitted as hard copy separate from and in addition to the PDF copy. Submittal forms shall indicate when hard copy color documents are submitted. All PDF product data submittal documents shall have the Contractors review and submittal stamp (including signatures) as specified in Section 01332, "Submittal Procedures" the same as if submitted as hard copy. Examples of product data include, but are not limited to:

- a. Manufacturer's printed literature.
- b. Preprinted product specification data and installation instructions.

3.1.4 Samples

Sample submittals shall be physically submitted as specified in Section 01332 "Construction Submittal Procedures". Contractor shall enter submittal data information into WebCM with a copy of the transmittal form(s) attached to the submittal. Examples of samples include, but are not limited to:

- a. Product finishes and color selection samples.
- b. Product finishes and color verification samples.
- c. Finish/color boards.
- d. Physical samples of materials.

3.1.5 Administrative Submittals

All correspondence and Preconstruction submittals shall be submitted on WebCM. Examples of administrative submittals include, but are not limited to:

- a. Digging permits and notices for excavation.
- b. List of Contractor personnel accessing WebCM.
- c. List of contact personnel.
- d. Notices for roadway interruption, work outside regular hours, and utility cutovers.

- e. Requests for Information (RFI).
- f. Network Analysis Schedules and associated reports and updates. Each schedule submittal specified in Specification Section 01321 shall be submitted as a native backed-up file (.PRX or .STX) of the scheduling program being used. The schedule will also be posted as a PDF file in the format specified in Specification Section 01321. Due to data transfer rates, do not display relationship lines in the graphical depiction of the schedule.
- g. Submittal Register: Use the submittal register data provided by the Government. Contractor shall input data for dates as specified and upon acceptance of the register; load the register up to WebCM and update as required by the Contract documents.
- h. Plans for safety, demolition, environmental protection, and similar activities.
- i. Quality Control Plan(s), Testing Plan and Log, Quality Control Reports, Production Reports, Quality Control Specialist Reports, Preparatory Phase Checklist, Initial Phase Checklist, Field Test reports, Summary reports, Rework Items List, etc.
- j. Meeting minutes for Post Award Kick-off Meeting, design review meetings, quality control meetings, progress meetings, pre-installation meetings, etc.
- k. Any general correspondence submitted.

3.1.6 Compliance Submittals

Test report, certificate, and manufacture field report submittals shall be submitted on WebCM as PDF attachments. Examples of compliance submittals include, but are not limited to:

- a. Field test reports.
- b. Quality Control certifications.
- c. Manufacturers documentation and certifications for quality of products and materials provided.

3.1.7 Record and Closeout Submittals

Operation and maintenance data and closeout submittals shall be submitted on WebCM as PDF documents during the approval and review stage as specified, with actual set of documents submitted for final. Examples of record submittals include, but are not limited to:

- a. Operation and Maintenance Manuals: Final documents shall be submitted as specified.

b. As-built Drawings: Final documents shall be submitted as specified.

c. Extra Materials, Spare Stock, etc.: Submittal forms shall indicate when actual materials are submitted.

3.1.8 Exceptions

Documents with legal consequences, contract modifications, contract claims, security implications, and those required by other agencies may require an additional submittal as original hard copy with original signatures and seals. Hard copies of these documents shall be submitted as specified or as directed by the Contracting Officer.

-- End of Section --

SECTION 01332N

CONSTRUCTION SUBMITTAL PROCEDURES

09/03

PART 1 GENERAL

1.1 SUMMARY

This section covers construction submittals used to demonstrate conformance with the requirements of the contract.

1.2 DEFINITIONS

Contract Clauses "FAR 52.236-5, Material and Workmanship," paragraph (b) and "FAR 52.236-21, Specifications and Drawings for Construction," paragraphs (d), (e), and (f) apply to all "submittals."

1.3 SUBMITTAL DESCRIPTIONS (SD)

Submittal requirements are specified within technical sections. Submittals are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

Certificates of insurance.

Surety bonds.

List of proposed subcontractors.

List of proposed products.

Construction Progress Schedule.

Submittal register.

Schedule of values.

Health and safety plan.

Work plan.

Quality control plan.

Environmental protection plan.

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work. Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project. Drawings

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

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work. Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project. Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies, which are to be incorporated into the project and those, which will be removed at conclusion of the work.

SD-05 Design Data

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

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.) Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation. Investigation reports
Daily checklists
Final acceptance test and operational test procedure.

SD-07 Certificates

Statements signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project. Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of

methods or personnel qualifications. Confined space entry permits.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions. Factory test reports.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and Maintenance personnel. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

SD-11 Closeout Submittals

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

1.3.1 Approving Authority

Person authorized to approve submittal.

1.3.2 Work

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

1.4 SUBMITTALS

The use of a "G" following a submittal indicates that approval of that submittal is required. These approval actions will either be accomplished by QC certification approval or by QC certification with Government approval, depending on where the submittal is located in the Specification. Submittals not having a "G" designation in the referenced or included UFGS sections are for information only and require QC certification. Non "G" items are to be listed on the submittal register but are not required to be sent to the Contracting Officer for surveillance. Submit the following in accordance with the requirements of this section.

SD-01 Preconstruction Submittals

Submittal Register; G

1.4.1 Submittals Reserved for Government Approval

Government approval is required for submittals with a "G" designation in Specification Part 2, Division 01 Specification Sections. In addition to the Specification Part 2 Division 01 Government approvals, the following submittals shall be certified by the QC Manager, and approved by the Contracting Officer.

1.5 USE OF SUBMITTAL REGISTER

Maintain submittal register as the work progresses. Do not change data in columns (c), (d), (e), and (f) prepared by the contractor. Retain data in columns (a), (g), (h), and (i) as accepted.

1.5.1 Submittal Register

Submit the completed submittal register. Submit with quality control plan and project schedule required by Section 01450N, "Construction Quality Control" and Section 01321N, "Network Analysis Schedules." Do not change data in columns (c), (d), (e), and (f) as accepted by the Government. Verify that all submittals required for project are listed and add missing submittals. Complete the following on the register:

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

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

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

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

1.5.2 Use of Submittal Register

Update the following fields in the Government-accepted submittal register.

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

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

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.5.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-accepted submittal register.

Column (b)

Column (l) List date of submittal receipt.

Column (m) through (p).

Column (q) List date returned to contractor.

1.5.4 Contractor Action Code and Action Code

Entries used will be as follows (others may be prescribed by Transmittal Form):

NR - Not Received

AN - Approved as noted

A - Approved

RR - Disapproved, Revise, and Resubmit

1.5.5 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request. Deliver in electronic format, unless a paper copy is requested by Contracting Officer.

1.6 PROCEDURES FOR SUBMITTALS

1.6.1 Reviewing, Certifying, Approving Authority

The QC organization shall be responsible for reviewing and certifying that submittals are in compliance with the contract requirements. Construction submittals with a "G" designation are subdivided into two different actions; one action requiring QC certification, the other action requiring QC certification (as Submittal Reviewer) and Government approval.

1.6.2 Constraints

- a. Submittals listed or specified in this contract shall conform to provisions of this section, unless explicitly stated otherwise.
- b. Submittals shall be complete for each definable feature of work; components of definable feature interrelated as a system shall be submitted at same time.
- c. When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.
- d. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.6.3 Scheduling

- a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential requirements to resubmit.
- b. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 15 working days for submittals for QC Manager approval and 20 working days for submittals for contracting officer approval. Period of review for submittals with contracting officer approval begins when Government receives submittal from QC organization. Period of review for each resubmittal is the same as for initial submittal.
- c. For submittals requiring review by Government's fire protection engineer, allow review period, beginning when government receives submittal from QC organization, of 30 working days for return of submittal to the contractor. Period of review for each resubmittal is the same as for initial submittal.

1.6.4 Variations

Variations from contract requirements require Government approval and will be considered where advantageous to the Government.

1.6.4.1 Considering Variations

Variations from contract requirements require Government approval and will be considered where advantageous to the Government.

1.6.4.2 Submission of Variations

Provide a written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government. Provide a cost-benefit analysis and submittals required for the item.

1.6.4.3 Warranting That Variations Are Compatible

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

1.6.4.4 Review Schedule Is Modified

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

1.6.5 Contractor's Responsibilities

- a. Determine and verify field measurements, materials, field construction criteria; review each submittal; and check and coordinate each submittal with requirements of the work and contract documents.

- b. Transmit submittals to QC organization in accordance with schedule on approved Submittal Register, and to prevent delays in the work, delays to government, or delays to separate contractors.
- c. Advise Contracting Officer of variation, as required by paragraph entitled "Variations."
- d. Correct and resubmit submittal as directed by approving authority. When resubmitting disapproved transmittals or transmittals noted for resubmittal, the contractor shall provide copy of that previously submitted transmittal including all reviewer comments for use by approving authority. Direct specific attention in writing or on resubmitted submittal, to revisions not requested by approving authority on previous submissions.
- e. Furnish additional copies of submittal when requested by contracting officer, to a limit of 20 copies per submittal.
- f. Complete work, which must be accomplished as basis of a submittal in time to allow submittal to occur as scheduled.
- g. Ensure no work has begun until submittals for that work have been returned as "approved," or "approved as Noted", except to the extent that a portion of work must be accomplished as basis of submittal.

1.6.6 QC Organization Responsibilities

- a. Note date on which submittal was received from Contractor on each submittal.
- b. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.
- c. Review submittals for conformance with project concepts and compliance with contract documents.
- d. Act on submittals, determining appropriate action based on QC organization's review of submittal.
 - (1) When QC Manager is approving authority, take appropriate action on submittal from the possible actions defined in paragraph entitled, "Actions Possible."
 - (2) When Contracting Officer is approving authority or when variation has been proposed, forward submittal to Government with certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate. The QC organization's review of submittal determines appropriate action.
- e. Ensure that material is clearly legible.
- f. Stamp each sheet of each submittal with QC certifying statement or approving statement, except that data submitted in bound volume or on

one sheet printed on two sides may be stamped on the front of the first sheet only.

(1) When approving authority is Contracting Officer, QC organization will certify submittals forwarded to Contracting Officer with the following certifying statement:
"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number 04-R-0087, 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

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

(Signature)

- g. Sign certifying statement or approval statement. The person signing certifying statements shall be QC organization member designated in the approved QC plan. The signatures shall be in original ink. Stamped signatures are not acceptable.
- h. Update submittal register database as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by contracting officer.
- i. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

1.6.7 Government's Responsibilities

When approving authority is Contracting Officer, the Government will:

- a. Note date on which submittal was received from QC Manager, on each submittal for which the Contracting Officer is approving authority.
- b. Review submittals for approval within scheduling period specified and only for conformance with project concepts and compliance with contract documents.
- c. Identify returned submittals with one of the actions defined in paragraph entitled "Actions Possible" and with markings appropriate for action indicated.

1.6.8 Actions Possible

Submittals will be returned with one of the following notations:

- a. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of

review by contractor or for being incomplete, with appropriate action, coordination, or change.

b. Submittals marked "approved" "approved as submitted" authorize Contractor to proceed with work covered.

c. Submittals marked "approved as noted" or "approval except as noted; resubmission not required" authorize contractor to proceed with work as noted provided Contractor takes no exception to the notations.

d. Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with project concept or requirements of the contract documents and shall be resubmitted with appropriate changes. No work shall proceed for this item until resubmittal is approved.

1.7 FORMAT OF SUBMITTALS

1.7.1 Transmittal Form

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

1.7.2 Identifying Submittals

Identify submittals, except sample panel and sample installation, 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. Section number of the specification section by which submittal is required.
- d. Submittal description (SD) number of each component of submittal.
- e. When a resubmission, add alphabetic suffix on submittal description, for example, SD-10A, to indicate resubmission.
- f. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other second tier contractor associated with submittal.
- g. Product identification and location in project.

1.7.3 Format for SD-02 Shop Drawings

- a. Shop drawings shall not be less than 8 1/2 by 11 inches nor more than 30 by 42 inches.
- b. Present 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.
- c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled "Identifying Submittals."
- d. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Shop drawing dimensions shall be the same unit of measure as indicated on the contract drawings. Identify materials and products for work shown.

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

- a. Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.
- b. Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.
- c. Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project.

1.7.5 Format of SD-04 Samples

- a. Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:
 - (1) Sample of Equipment or Device: Full size.
 - (2) Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.
 - (3) 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.
 - (4) 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.
 - (5) Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.
 - (6) Color Selection Samples: 2 by 4 inches.
 - (7) Sample Panel: 4 by 4 feet.
 - (8) Sample Installation: 100 square feet.

- b. Samples Showing Range of Variation: Where variations are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range.
- c. Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples shall be in undamaged condition at time of use.
- d. Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean up of project.
- e. When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.7.6 Format of SD-07 Certificates

- a. Provide certifications on 297 by 210 mm (8-1/2 by 11 in) paper. Provide a bound volume for submittals containing numerous pages.

1.7.7 Format of SD-06 Test Reports and SD-09 manufacturer's Field Reports

- a. Provide reports on 297 by 210 mm (8-1/2 by 11 in) paper in a complete bound volume.
- b. Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

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

- a. O&M Data format shall comply with the requirements specified in Section 01781, Operation and Maintenance Data."

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

- a. When submittal includes a document, which is to be used in project or become part of project record, other than as a submittal, do not apply contractor's approval stamp to document, but to a separate sheet accompanying the document.
- b. Provide all dimensions in administrative submittals in metric. Where data are included in preprinted material with English units only, submit metric dimensions on separate sheet.

1.8 QUANTITY OF SUBMITTALS

1.8.1 Number of Copies of Shop Drawings

Submit seven copies of submittals of shop drawings requiring review and approval by Contracting Officer.

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

Submit product data in compliance with quantity requirements specified for shop drawings.

1.8.3 Number of SD-04 Samples

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

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

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

1.8.4 Number of Copies SD-07 Certificates

a. Submit in compliance with quantity requirements specified for shop drawings.

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

a. Submit in compliance with quantity with quality requirements specified for shop drawings.

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

Submit five copies of O&M Data.

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

Unless otherwise specified, submit administrative submittals in compliance with quantity requirements specified for shop drawings.

1.9 FORWARDING SUBMITTALS

1.9.1 Submittals Required from the Contractor

As soon as practicable after award of contract, and before procurement of fabrication, forward to the Contracting Officer submittals required in the technical sections of this specification, including shop drawings, product data and samples. One copy of all submittals shall be forwarded to the Resident Officer in Charge of Construction. Contracting Officer will review and approve those submittals reserved for Contracting Officer approval to verify submittals comply with the contract requirements.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used.

-- End of Section --

SECTION 01415

METRIC MEASUREMENTS

09/01

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 basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 380 (1993) Practice for Use of the International System of Units (SI)

ASTM E 621 (1994; R 1999e1) Practice for Use of Metric (SI) Units in Building Design and Construction

1.2 GENERAL

This project includes metric units of measurements. The metric units used are the International System of Units (SI) developed and maintained by the General Conference on Weights and Measures (CGPM); the name International System of Units and the international abbreviation SI were adopted by the 11th CGPM in 1960. A number of circumstances require that both metric SI units and English inch-pound (I-P) units be included in a section of the specifications. When both metric and I-P measurements are included, the section may contain measurements for products that are manufactured to I-P dimensions and then expressed in mathematically converted metric value (soft metric) or, it may contain measurements for products that are manufactured to an industry recognized rounded metric (hard metric) dimensions but are allowed to be substituted by I-P products to comply with the law. Dual measurements are also included to indicate industry and/or Government standards, test values or other controlling factors, such as the code requirements where I-P values are needed for clarity or to trace back to the referenced standards, test values or codes.

1.3 USE OF MEASUREMENTS

Measurements shall be either in SI or I-P units as indicated, except for soft metric measurements or as otherwise authorized. When only SI or I-P measurements are specified for a product, the product shall be procured in the specified units (SI or I-P) unless otherwise authorized by the Contracting Officer. The Contractor shall be responsible for all associated labor and materials when authorized to substitute one system of units for another and for the final assembly and performance of the specified work and/or products.

1.3.1 Hard Metric

A hard metric measurement is indicated by an SI value with no expressed correlation to an I-P value. Hard metric measurements are often used for field data such as distance from one point to another or distance above the floor. Products are considered to be hard metric when they are manufactured to metric dimensions or have an industry recognized metric designation.

1.3.2 Soft Metric

- a. A soft metric measurement is indicated by an SI value, which is a mathematical conversion of the I-P value shown in parentheses (e.g. 38.1 mm (1-1/2 inches)). Soft metric measurements are used for measurements pertaining to products, test values, and other situations where the I-P units are the standard for manufacture, verification, or other controlling factor. The I-P value shall govern while the metric measurement is provided for information.
- b. A soft metric measurement is also indicated for products that are manufactured in industry designated metric dimensions but are required by law to allow substitute I-P products. These measurements are indicated by a manufacturing hard metric product dimension followed by the substitute I-P equivalent value in parentheses (e.g., 190 x 190 x 390 mm (7-5/8 x 7-5/8 x 15-5/8 inches)).

1.3.3 Neutral

A neutral measurement is indicated by an identifier, which has no expressed relation to either an SI or an I-P value (e.g., American Wire Gage (AWG) which indicates thickness but in itself is neither SI nor I-P).

1.4 COORDINATION

Discrepancies, such as mismatches or product unavailability, arising from use of both metric and non-metric measurements and discrepancies between the measurements in the specifications and the measurements in the drawings shall be brought to the attention of the Contracting Officer for resolution.

1.5 RELATIONSHIP TO SUBMITTALS

Submittals for Government approval or for information only shall cover the SI or I-P products actually being furnished for the project. The Contractor shall submit the required drawings and calculations in the same units used in the contract documents describing the product or requirement unless otherwise instructed or approved. The Contractor shall use **ASTM E 380** and **ASTM E 621** as the basis for establishing metric measurements required to be used in submittals.

-- End of Section --

SECTION 01450N

CONSTRUCTION QUALITY CONTROL
11/03

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.

ASTM INTERNATIONAL (ASTM)

- ASTM A 880 (1995) Criteria for Use in Evaluation of Testing Laboratories and Organizations for Examination and Inspection of Steel, Stainless Steel, and Related Alloys
- ASTM C 1077 (2003) Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
- ASTM D 3666 (2003) Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
- ASTM D 3740 (2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
- ASTM E 329 (2003) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
- ASTM E 543 (2002) Agencies Performing Nondestructive Testing

U.S. ARMY CORPS OF ENGINEERS (USACE)

- EM 385-1-1 (2003) U.S. Army Corps of Engineers 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 information only or as

otherwise designated. 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 01332N CONSTRUCTION SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Quality Control (QC) Plan; G

The QC Plan shall include a preliminary submittal of the list of definable features of work that shall cover the first 90 days of construction.

Submit the completed list of definable features of work in conjunction with the Accepted Network Analysis Schedule, but prior to commencement of any of the associated work activities.

Acceptance by the Government of the QC Plan shall be considered to be "accepted as noted, resubmittal required" and will be in effect only until the completed list of definable features of work is received and accepted. If the completed list of definable features of work and accepted network schedule is not received within the time indicated in the paragraph entitled "Baseline Network Analysis Schedule" of Section 01321N "Network Analysis Schedules," the QC Plan will become rejected and all work, except for the work authorized in the paragraph entitled "Preliminary Construction Work Authorized Prior to Acceptance," will stop.

SD-11 Closeout Submittals

Training Outline; G

Training Video Recording G

Validation of Training Completion; G

1.3 INFORMATION FOR THE CONTRACTING OFFICER

All electronic submissions of QC documentation will be through the Web Based Construction Management (WebCM) system. Refer to the requirements of Section 01322 "Web Based Construction Management (WebCM)". The Contractor shall use the Daily Report forms that are available in WebCM. Other reports referenced below that are not contained in WebCM may be in formats customarily used by the Contractor, Testing Laboratories, etc. and will contain the information required by this specification. These "other reports" will also be submitted, as attachments to the Daily Reports, through WebCM.

Deliver the following to the Contracting Officer during Construction:

- a. Contractor Quality Control Report: Submit the report electronically by 10:00 AM the next working day after each day that work is performed.
- b. Contractor Production Report: Submit the report electronically by 10:00 AM the next working day after each day that work is performed.
- c. Preparatory Phase Checklist: Submit the report electronically in the same manner as the Contractor Quality Control Report. Original attached to the original Contractor Quality Control Report and 1 copy attached to each QC Report copy.
- d. Initial Phase Checklist: Submit the report electronically in the same manner as the Contractor Quality Control Report. Original attached to the original Contractor Quality Control Report and 1 copy attached to each QC Report copy.
- e. Field Test Reports: Within 2 working days after the test is performed, submit the report as an electronic attachment to the Contractor Quality Control Report. Mail or hand-carry the original within 2 working days after the test is performed, attached to the original Contractor Quality Control Report and 1 copy attached to each QC Report copy.
- f. Monthly Summary Report of Tests: Submit the report as an electronic attachment to the Contractor Quality Control Report. Mail or hand-carry the original attached to the Contractor Quality Control Report and 1 copy attached to each QC Report copy.
- g. Testing Plan and Log: Submit the report as an electronic attachment to the Contractor Quality Control Report, at the end of each month. Mail or hand-carry the original attached to the last QC Report of each month and 1 copy attached to each QC Report copy.
- h. Rework Items List: Submit entries to this report daily, in the same manner as the Contractor Quality Control Report. Mail or hand-carry the original attached to the last QC Report of each month and 1 copy attached to each QC Report copy.
- i. QC Meeting Minutes: Within 2 working days after the test is performed, submit the report as an electronic attachment to the Contractor Quality Control Report. Mail or hand-carry the original within 2 working days after the test is performed, attached to the original Contractor Quality Control Report and 1 copy attached to each QC Report copy.
- j. 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, both under the cognizance of the Project Quality Control Manager, (hereafter known as the QC Manager); QC Plan(s), QC Plan Meeting(s), a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, testing, completion inspections, and QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this Contract. The QC program shall cover on-site and off-site work and shall 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 shall report to an officer of the firm and shall 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 Quality Control Manager is the primary individual responsible for quality control, all three individuals will be held responsible for the quality of work on the job. The project superintendent will be held responsible for the quality of production.

1.4.1 Commissioning

Commissioning is a systematic process of ensuring that all building systems perform interactively according to the Contract Documents. The Quality Control (QC) Program is a key to this process by coordinating, verifying and documenting measures to achieve the following objectives:

- a. Verify that the applicable equipment and systems are installed in accordance with the contract documents and according to the manufacturer's recommendations.
- b. Verify and document proper performance of equipment and systems.
- c. Verify that O&M documentation is complete.
- d. Verify that the Government's operating personnel are adequately trained.
- e. Document the successful achievement of the commissioning objectives listed above.

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 Construction QC Plan is mobilization of storage and office trailers, temporary utilities, and surveying.

1.4.3 Acceptance of the Construction Quality Control (QC) Plan

Acceptance of the Construction 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 shall be subject to acceptance by the Contracting Officer. The Contracting Officer may require the removal of any individual for non-compliance with quality requirements specified in the contract.

1.4.4 Notification of Changes

Notify the Contracting Officer, in writing, of any proposed change, including changes in the QC organization personnel, a minimum of seven calendar days prior to a proposed change. Proposed changes shall be 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 may be designated as the safety competent person as defined by EM 385-1-1. The QC Manager is required to attend the Post Award Conference, Partnering Meetings, QC Plan Meetings, attend the Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control, 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 Testing Laboratory personnel and any other inspection and testing personnel required by this Contract. The QC Manager is the manager of all QC Activities.

1.5.1.2 Qualifications

An individual with a minimum of 5 years combined experience in the following positions; 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 shall have at least 2 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 and safety compliance.

1.5.2 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager shall have completed the course entitled "Construction Quality Management for Contractors." If the QC Manager does not have a current certification, they shall 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 available CQM Training 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 shall be the same as for the principle QC manager.

1.6 QUALITY CONTROL (QC) PLANS

1.6.1 Construction Quality Control (QC) Plan

1.6.1.1 Requirements

The Construction QC Plan documents the proposed method and responsibilities for accomplishing commissioning activities during the construction of the project. Provide, for acceptance by the Contracting Officer, a Construction QC plan submitted in a 3-ring binder with pages numbered sequentially that covers both on-site and off-site work and includes the following:

a. A table of contents listing the major sections identified with tabs in the following order:

- I. QC ORGANIZATION
- II. NAMES AND QUALIFICATIONS
- III. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONNEL
- IV. OUTSIDE ORGANIZATIONS
- V. APPOINTMENT LETTERS
- VI. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER
- VII. TESTING LABORATORY INFORMATION
- VIII. TESTING PLAN AND LOG
- IX. PROCEDURES TO COMPLETE REWORK ITEMS
- X. DOCUMENTATION PROCEDURES
- XI. LIST OF DEFINABLE FEATURES
- XII. PROCEDURES FOR PERFORMING THE THREE PHASES OF CONTROL

b. A chart showing the QC organizational structure.

- c. Names and qualifications, in resume format, for each person in the QC organization. Include the CQM for Construction 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".
- d. Duties, responsibilities and authorities of each person in the QC organization.
- e. 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.
- f. 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 quality control, and their authority to stop work which is not in compliance with the contract.
- g. 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 entitled "Submittal Procedures."
- h. Testing laboratory information required by the paragraphs entitled "Accreditation Requirements" or "Construction Materials Testing Laboratory Requirements", as applicable.
- i. 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.
- j. Procedures to identify, record, track and complete rework items.
- k. Documentation procedures, including proposed report formats.
- l. List of definable features of work. A definable feature of work (DFOW) is a task, which is separate and distinct from other tasks, has the same control requirements and work crews. The list shall be cross-referenced to the contractor's Construction Schedule and the specification sections. For projects requiring a Network Analysis Schedule, the list of definable features of work shall include but not be limited to all critical path activities.
- m. Procedures for Performing the Three Phases of Control. For each DFOW, provide the DFOW's Preparatory and Initial Phase Checklists. Each list shall include a breakdown of quality

checks that will be used when performing the quality control functions, inspections, and tests required by the contract documents. The Preparatory and Initial Phases and meetings shall be conducted with a view towards obtaining quality construction by planning ahead and identifying potential problems for each definable feature of work.

n. Procedures for Identifying and Documenting the Completion Inspection process. Include in these procedures the responsible party for punch out inspection, prefinal inspection, and final acceptance inspection.

1.7 QC PLAN MEETING(S)

1.7.1 QC Plan Meeting

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 Construction QC plan requirements prior to plan development and submission and to agree on the Contractor's list of definable features of work (DFOW's).

1.8 COORDINATION AND MUTUAL UNDERSTANDING MEETING

After submission of the QC Plan, and prior to the start of construction, the QC Manager will meet with the Contracting Officer to present the QC program required by this Contract. 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, and the coordination of the Contractor's management, production and QC personnel. At the meeting, the Contractor will be required to explain in detail how three phases of control will be implemented for each definable feature of work. As a minimum, the Contractor's personnel required to attend shall include an officer of the firm, the project manager, project superintendent, QC Manager, Alternate QC Manager, and subcontractor representatives. Each subcontractor who will be assigned QC responsibilities shall have a principal of the firm at the meeting. Minutes of the meeting will be prepared by the QC Manager and signed by the Contractor and the Contracting Officer. A copy of the signed minutes shall be provided to all attendees by the Contractor. Repeat the coordination and mutual understanding meeting when a new QC Manager is appointed.

1.9 QC MEETINGS

After the start of construction, the QC Manager shall conduct QC meetings once every two weeks at the work site with the project superintendent. The QC Manager shall prepare the minutes of the meeting and provide a copy to the Contracting Officer within 2 working days after the meeting. The Contracting Officer may attend these meetings. The QC Manager shall notify the Contracting Officer at least 48 hours in advance of each meeting. As a minimum, the following shall be accomplished at each meeting:

- a. Review the minutes of the previous meeting;
- b. Review the schedule and the status of work:
 - (1) Work or testing accomplished since last meeting
 - (2) Rework items identified since last meeting
 - (3) Rework items completed since last meeting;
- c. Review the status of submittals:
 - (1) Submittals reviewed and approved since last meeting
 - (2) Submittals required in the near future;
- d. Review the work to be accomplished in the next 2 weeks and documentation required:
 - (1) Establish completion dates for rework items
 - (2) Update the schedule showing planned and actual dates of the preparatory, initial and follow-up phases, including testing and any other inspection required by this contract
 - (3) Discuss construction methods and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each definable feature of work
 - (4) Discuss status of off-site work or testing
 - (5) Documentation required;
 - (6) Discuss upcoming Activity Hazard Analyses:
- e. Resolve QC and production problems:
 - (1) Assist in resolving Request for Information issues; and
- f. Address items that may require revising the QC plan:
 - (1) Changes in QC organization personnel
 - (2) Changes in procedures;
- g. Review health and safety plan

1.10 THREE PHASES OF CONTROL

The Three Phases of Control shall adequately cover both on-site and off-site work and shall include the following for each definable feature of work.

1.10.1 Preparatory Phase

Notify the Contracting Officer at least 2 work days in advance of each preparatory phase. This phase shall include a meeting conducted by the QC Manager and attended by the superintendent, and the foreman responsible for the definable feature. 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 definable feature of work:

- a. Review each paragraph of the applicable specification sections;
- b. Review the Contract drawings;
- c. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- e. 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. Discuss construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each definable feature of work; and
- h. Review the safety plan and appropriate activity hazard analysis to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted.

1.10.2 Initial Phase

Notify the Contracting Officer at least 2 work days in advance of each initial phase. When construction crews are ready to start work on a definable feature of work, conduct the initial phase with the superintendent, and the foreman responsible for that definable feature of work. Observe the initial segment of the definable feature of work to ensure that the work complies with Contract requirements. Document the results of the initial phase in the daily Contractor Quality Control 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 definable feature of work:

- a. Establish the quality of workmanship required;
- b. Resolve conflicts;
- c. Ensure that testing is performed by the approved laboratory,
- d. Check work procedures for compliance with the Safety Plan and the appropriate activity hazard analysis to ensure that applicable safety requirements are met.

1.10.3 Follow-Up Phase

Perform the following for on-going work daily, or more frequently as necessary until the completion of each definable feature of work and document in the daily Contractor Quality Control 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; and
- e. Perform safety inspections.

1.10.4 Additional Preparatory and Initial Phases

Additional Preparatory and Initial Phases shall be conducted on the same definable features of work 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 definable feature is resumed after substantial period of inactivity, or if other problems develop.

1.10.5 Notification of Three Phases of Control for Off-Site Work

Notify the Contracting Officer at least two weeks prior to the start of the preparatory and initial phases.

1.11 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review and approval of submittals are described in section entitled "Submittal Procedures."

1.12 TESTING

Except as stated otherwise in the specification sections, perform sampling and testing required under this Contract.

1.12.1 Accreditation Requirements

Construction materials testing laboratories performing work for Navy construction contracts will be required to submit the following:

- a. A copy of the Certificate of Accreditation and Scope of Accreditation by an acceptable laboratory accreditation authority.

Construction materials testing laboratories performing work for Navy construction contracts must be accredited by one of the laboratory accreditation authorities. The laboratory's scope of accreditation must include the ASTM standards listed in the paragraph titled "Construction Materials Testing Laboratory Requirements" as appropriate to the testing field. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office".

1.12.2 Construction Materials Testing Laboratory Requirements

Provide an independent construction materials testing laboratory or establish a laboratory accredited by an acceptable laboratory accreditation authority to perform sampling and tests required by this Contract. Testing laboratories that have obtained accreditation by an acceptable laboratory accreditation authority listed in the paragraph entitled "Laboratory Accreditation Authorities" submit to the Contracting Officer, a copy of the Certificate of Accreditation and Scope of Accreditation. The scope of the laboratory's accreditation shall include the test methods required by the Contract. For testing laboratories that have not yet obtained accreditation by an acceptable laboratory accreditation authority listed in the paragraph entitled "Laboratory Accreditation Authorities" submit an acknowledgment letter from one of the laboratory accreditation authorities indicating that the application for accreditation has been received and the accreditation process has started, and submit to the Contracting Officer for approval, certified statements, signed by an official of the testing laboratory attesting that the proposed laboratory, meets or conforms to the ASTM standards listed below as appropriate to the testing field.

- a. Laboratories engaged in testing of construction materials shall meet the requirements of [ASTM E 329](#).
- b. Laboratories engaged in testing of concrete and concrete aggregates shall meet the requirements of [ASTM C 1077](#).
- c. Laboratories engaged in testing of bituminous paving materials shall meet the requirements of [ASTM D 3666](#).
- d. Laboratories engaged in testing of soil and rock, as used in engineering design and construction, shall meet the requirements of [ASTM D 3740](#).

e. Laboratories engaged in inspection and testing of steel, stainless steel, and related alloys will be evaluated according to **ASTM A 880**.

f. Laboratories engaged in nondestructive testing (NDT) shall meet the requirements of **ASTM E 543**.

g. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA.

1.12.3 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology at <http://ts.nist.gov/ts/htdocs/210/214/214.htm> , the American Association of State Highway and Transportation Officials (AASHTO) program at <http://www.transportation.org/aashto/home.nsf/frontpage> , International Accreditation Services, Inc. (IAS) at <http://www.iasonline.org>, U. S. Army Corps of Engineers Materials Testing Center (MTC) at <http://www.wes.army.mil/SL/MTC/>, the American Association for Laboratory Accreditation (A2LA) program at <http://www.a2la2.net/>, the Washington Association of Building Officials (WABO) at <http://www.wabo.org/> (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL) at <http://www.wacel.org/labaccred.html> (Approval authority by WACEL is limited to projects within the Chesapeake Division and Public Works Center Washington geographical area).

Furnish to the Contracting Officer, a copy of the Certificate of Accreditation and Scope of Accreditation. The scope of the laboratory's accreditation shall include the test methods required by the Contract.

1.12.4 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.

1.12.5 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 shall 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. Attach a copy of the summary report to the last daily Contractor Quality Control Report of each month.

1.12.6 Test Reports and Monthly Summary Report of Tests

The QC Manager shall 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. A copy of the signed test reports and certifications shall be provided to the OMSI preparer for inclusion into the OMSI documentation.

1.13 QC CERTIFICATIONS

1.13.1 Contractor Quality Control Report Certification

Each Contractor Quality Control Report shall contain the following statement: "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 the 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 shall furnish a certificate to the Contracting Officer attesting that "the work has been completed, inspected, tested and is in compliance with the Contract." A copy of this final QC Certification for completion shall be provided to the OMSI preparer for inclusion into the OMSI documentation.

1.14 COMPLETION INSPECTIONS

1.14.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Contract Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Include in the punch list any remaining items on the "Rework Items List" which were not corrected prior to the Punch-Out Inspection. The punch list shall include the estimated date by which the deficiencies will be corrected. A copy of the punch list shall be provided to the

Contracting Officer. The QC Manager or staff shall make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished the Contractor shall notify the Government that the facility is ready for the Government "Pre-Final Inspection."

1.14.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied. A Government "Pre-Final Punch List" may be developed as a result of this inspection. The QC Manager shall ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the customer can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in timely manner and shall be accomplished before the contract completion date for the work or any particular increment thereof if the project is divided into increments by separate completion dates.

1.14.3 Final Acceptance Inspection

The QC Manager, the superintendent or other primary contractor management personnel, and the Contracting Officer's representative will be in attendance at this inspection. Additional Government personnel may be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the "Pre-Final Inspection". Notice shall be given to the Contracting Officer at least 14 days prior to the final inspection stating that all specific items previously identified to the Contractor as being unacceptable, along with all the remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. 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." When the Contracting Officer takes possession of partially completed work, it will be in accordance with Contract Clause "Use and Possession Prior to Completion".

1.15 TRAINING

Prior to contract beneficial occupancy date of the facility by the Contracting Officer shall coordinate and provide a comprehensive project-specific government personnel training program for the systems of the facility specified in the technical specifications of this contract. The core of this training will be based on manufacturer's recommendations and the operation and maintenance information provided as a part of this contract. The course shall provide a brief summary of Part I, "Facility Information" and a more detailed presentation of Part II, "Primary Systems Information" from the operation and maintenance manuals provided under the Section 01782N, "Facility Operation and Maintenance Support Information". The presentation shall be weighted so as to spend 95% of instruction time on Part II. Instructors shall be well-versed in the particular systems that they

are presenting. Provide instruction time on site at a location approved by the Contracting Officer.

1.15.1 Training Outline

Provide each trainee in the course a written course outline, listing the major and minor topics to be discussed by the instructor on each day of the course.

1.15.2 Video Recording

Provide to the Contracting Officer two copies of the training course in VHS video recording format. The recording shall record in video and audio all instructors' training presentations including question and answer periods with the trainees.

1.15.3 Unresolved Questions From Trainees

If, at the end of the training course, there are questions from trainees that remain unresolved, the instructor shall send the answers, in writing, to the Contracting Officer for transmittal to the trainees, and the training video should be modified to include the appropriate clarifications.

1.15.4 Validation of Training Completion

Provide completed and signed "Validation of Training" forms as provided in the Contractor QC Plan for all training sessions accomplished. Provide two copies of the signed training validation forms to the Contracting Officer and one copy to the OMSI preparer for inclusion into the OMSI documentation.

1.16 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities. The Contractor shall submit all documentation per Section 01322N "Web Based Construction Management (WebCM)".

1.16.1 Contractor Production Report

Reports are required for each day that work is performed and shall accompany the submission of the Contractor Quality Control Report prepared for the same day. This requirement shall commence at the beginning of the construction phase of work and continue through final completion of the contract. Account for each calendar day throughout the life of the Contract. The reporting of work shall be identified by terminology consistent with the construction schedule. Contractor Production Reports are to be prepared, signed and dated by the project superintendent and shall contain the following information:

- a. Date of report, report number, name of contractor, Contract number, title and location of Contract and superintendent present.

- b. Weather conditions in the morning and in the afternoon including maximum and minimum temperatures.
- c. Identify work performed by corresponding Schedule Activity No., PC#, Modification No., etc.
- d. A list of Contractor and subcontractor personnel on the work site, their trades, employer, work location, description of work performed, hours worked by trade, daily total work hours on work site this date (include hours on continuation sheets), and total work hours from start of construction.
- e. A list of job safety actions taken and safety inspections conducted. Indicate that safety requirements have been met including the results on the following:
 - (1) Was a job safety meeting held this date? (If YES, attach a copy of the meeting minutes.)
 - (2) Were there any lost time accidents this date? (If YES, attach a copy of the completed OSHA report.)
 - (3) Was crane/manlift/trenching/scaffold/hv electrical/high work/hazmat work done? (If YES, attach a statement or checklist showing inspection performed.)
 - (4) Was hazardous material/waste released into the environment? (If YES, attach a description of incident and proposed action.)
- f. Identify Schedule Activity No. related to safety action and list safety actions taken today and safety inspections conducted.
- g. Identify Schedule Activity No., Submittal # and list equipment/material received each day that is incorporated into the job.
- h. Identify Schedule Activity No., Owner and list construction and plant equipment on the work site including the number of hours used.
- i. Include a "remarks" section in this report which will contain pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site. For each remark given, identify the Schedule Activity No. that is associated with the remark.

1.16.2 Contractor Quality Control Report

Reports are required for each day that work is performed and for every seven consecutive calendar days of no-work and on the last day of a no-work period. Account for each calendar day throughout the life of the Contract. The reporting of work shall be identified by terminology consistent with the construction schedule. Contractor Quality Control Reports are to be prepared, signed and dated by the Project QC Manager and shall contain the following information:

- a. Date of report, report number, Contract Number, and Contract Title.
- b. Indicate if Preparatory Phase work was performed today (Yes/No checkboxes).
- c. If Preparatory Phase work was performed today (including on-site and off-site work), identify its Schedule Activity No. and Definable Feature of Work. The Index # is a cross reference to the Preparatory Phase Checklist. An example of the Index # is: 0025-P01, where "0025" is the Contractor Quality Control Report Number, "P" indicates Preparatory Phase, and "01" is the Preparatory Phase Checklist number(s) for this date. Each entry in this section must be accompanied with a corresponding Preparatory Phase Checklist.
- d. Indicate if Initial Phase work was performed today (Yes/No checkboxes).
- e. Results of the Follow-up Phase inspections held today (including on-site and off-site work), including Schedule Activity No., the location of the definable feature of work, Specification Sections, etc. Indicate in the report for this definable feature of work that the work complies with the Contract as approved in the Initial Phase, work complies with safety requirements, and that required testing has been performed and include a list of who performed the tests.
- f. Include a "remarks" section in this report which will contain pertinent information including directions received, quality control problem areas, deviations from the QC plan, construction deficiencies encountered, QC meetings held, acknowledgement that as-built drawings have been updated, corrective direction given by the QC Organization and corrective action taken by the Contractor. For each remark given, identify the Schedule Activity No. that is associated with the remark.
- g. Contractor Quality Control Report certification, signature and date.

1.16.3 Preparatory Phase Checklist

Each Definable Feature of Work that is in the Preparatory Phase shall have this checklist filled out for it. The checklist shall be identified by terminology consistent with the construction schedule. This checklist shall be attached to the Contractor Quality Control Report of the same date.

- a. Specification Section, date of report, and Contract number shall be filled out. Duplicate this information in the header of the second page of the report.
- b. Personnel Present: Indicate the number of hours of advance notice that was given to the Government Representative and indicate (Yes/No checkboxes) whether or not the Government Rep was notified. Indicate the Names of Preparatory Phase Meeting attendees, their position and company/government they are with.
- c. Submittals: Indicate if submittals have been approved (Yes/No checkboxes), if no indicate what has not been submitted. Are materials on hand (Yes/No checkboxes) and if not, what items are missing. Check delivered material/equipment against approved submittals and comment as required.
- d. Material Storage: Indicate if materials/equipment is stored properly (Yes/No checkboxes) and if not, what action is/was taken.
- e. Specifications: Review and comment on Specification Paragraphs that describe the material/equipment, procedure for accomplishing the work and clarify any differences.
- f. Preliminary Work & Permits: Ensure preliminary work is in accordance with the contract documents and necessary permits are on file, if not, describe the action taken.
- g. Testing: Identify who performs tests, the frequency, and where tests are to occur. Review the testing plan, report abnormalities, and if the test facilities have been approved.
- h. Safety: Indicate if the activity hazard analysis has been approved (Yes/No checkboxes) and comment on the review of the applicable portions of the EM 385-1-1.
- i. Meeting Comments: Note comments and remarks during the Preparatory Phase Meeting that was not addressed in previous sections of this checklist.
- j. Other Items or Remarks: Note any other remarks or items that were a result of the Preparatory Phase.
- k. QC Manager will sign and date the checklist.

1.16.4 Initial Phase Checklist

Each Definable Feature of Work that is in the Initial Phase shall have this checklist filled out for it. The checklist shall be identified by terminology consistent with the construction schedule. This checklist shall be attached to the Contractor Quality Control Report of the same date.

- a. Specification Section, date of report, and Contract number shall be entered.
- b. Definable Feature of Work, Schedule Activity No. and Index # entry and format will match entry in the Initial Phase section of the Contractor Quality Control Report.
- c. Personnel Present: Indicate the number of hours of advance notice that was given to the Government Representative and indicate (Yes/No checkboxes) whether or not the Government Rep was notified. Indicate the Names of Initial Phase Meeting attendees, their position and company/government they are with.
- d. Procedure Compliance: Comment on compliance with procedures identified at Preparatory Phase of Control and assurance that work is in accordance with plans, specifications and submittals.
- e. Preliminary Work: Ensure preliminary work being placed is in compliance and if not, what action is/was taken.
- f. Workmanship: Identify where initial work is located; if a sample panel is required (Yes/No checkboxes); is the initial work the sample (Yes/No checkboxes); and if Yes, describe the panel location and precautions taken to preserve the sample.
- g. Resolution: Comment on any differences and the resolutions reached.
- h. Check Safety: Comment on the safety review of the job conditions.
- i. Other: Note any other remarks or items that were a result of the Initial Phase.
- j. QC Manager will sign and date the checklist.

1.16.5 Quality Control Validation

Establish and maintain the following in a series of 3 ring binders. Binders shall be divided and tabbed as shown below. These binders shall be readily available to the Government's Quality Assurance Team during all business hours.

- a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.
- b. All milestone inspections , arranged by Activity/Event Number.
- c. A current up-to-date copy of the Testing and Plan 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. A current up-to-date copy of the Rework Items List.
- f. Maintain up-to-date copies of all punch lists issued by the QC Staff on the Contractor and Sub-Contractors and all punch lists issued by the Government.

1.16.6 Testing Plan and Log

As tests are performed, the QC Manager shall record on the "Testing Plan and Log" the date the test was conducted, the date the test results were forwarded to the Contracting Officer, remarks and acknowledgement that an accredited or Contracting Officer approved testing laboratory was used. Attach a copy of the updated "Testing Plan and Log" to the last daily Contractor Quality Control Report of each month. A copy of the final "Testing Plan and Log" shall be provided to the OMSI preparer for inclusion into the OMSI documentation.

1.16.7 Rework Items List

The QC Manager shall 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. The Contractor shall be responsible for including on this list items needing rework including those identified by the Contracting Officer.

1.16.8 As-Built Drawings

The QC Manager is required to ensure the as-built drawings, required by Section 01770N "Closeout Procedures," 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 shall initial each deviation and each revision. Upon completion of work, the QC Manager shall furnish a certificate attesting to the accuracy of the as-built drawings prior to submission to the Contracting Officer.

1.16.9 Report Forms

The following forms, are acceptable for providing the information required by the paragraph entitled "Documentation." While use of these specific formats are not required, any other format used shall contain the same information:

- a. Contractor Quality Control Report w/ continuation sheet(s).
- b. Contractor Production Report w/ continuation sheet(s).

- c. Preparatory Phase Checklist.
- d. Initial Phase Checklist.
- e. Testing Plan and Log.
- f. Rework Items List.

1.17 NOTIFICATION ON NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected non-compliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall 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 shall be made the subject of claim for extension of time for excess costs or damages by the Contractor.

1.18 U. S. GREEN BUILDING COUNCIL LEED CERTIFICATION REQUIREMENTS

This project **may** require LEED Certification by the U. S. Green Building Council. LEED Certification will be evaluated on an individual basis. LEEDs analysis for most of the projects will be "self-certifying".

1.18.1 Commissioning Plan

Provide a copy of a Commissioning Plan, which contains the following components:

- a. A brief overview of the Commissioning Process. Briefly describe the Quality Control and the Operation and Maintenance Support Information (OMSI) Program requirements for the project. Provide copies of specification Sections 01450N and 01781 to supplement the description.
- b. Listing of all commissioned systems.
- c. Identification of all commissioning participants and responsibilities. Provide a final copy of Sections I through V and Section XIII from the Construction QC Plan.
- d. A description of the management, communication, and reporting of the Commissioning Plan.
- e. An outline of the commissioning process scope including:
 - (1) Submittal review procedures. Provide a copy of Section VI of the Construction QC Plan.

(2) Observation procedures. Provide a copy of Sections X, XII, XIV and IX of the Construction QC Plan. Highlight the requirements for verification of the correct installation of all systems.

(3) Start-up and Testing procedures. Provide copies of Sections VII & VIII of the Construction QC Plan.

(4) Training activities. Provide a copy of Section XV of the Construction QC Plan.

(5) O&M Documentation. Describe the information to be provided to the client as required by Specification Section 01781 "Operation and Maintenance Support Information (OMSI)."

(6) Warranty period activities.

f. A listing of the written work products.

g. An activity schedule.

h. A description of the rigor and scope of testing. Provide a copy of Section VII of the Construction QC Plan.

1.18.2 Commissioning Agent Certification Letter

Produce a letter signed by the contractor's commissioning agent certifying the commissioning plan has been successfully executed and the intent of the facility has been achieved.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

CONTRACTOR PRODUCTION REPORT				DATE		
(ATTACH ADDITIONAL SHEETS IF NECESSARY)						
CONTRACT NO		TITLE AND LOCATION		REPORT NO		
CONTRACTOR			SUPERINTENDENT			
AM WEATHER		PM WEATHER		MAX TEMP F	MIN TEMP F	
WORK PERFORMED TODAY						
Schedule Activity No.	WORK LOCATION AND DESCRIPTION		EMPLOYER	NUMBER	TRADE	HRS
JOB SAFETY	WAS A JOB SAFETY MEETING HELD THIS DATE? <input type="checkbox"/> YES <input type="checkbox"/> NO <small>(If YES attach copy of the meeting minutes)</small>			TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS		
	WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? <input type="checkbox"/> YES <input type="checkbox"/> NO <small>(If YES attach copy of completed OSHA report)</small>			CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT		
	WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? <small>(If YES attach statement or checklist showing inspection performed.)</small>			TOTAL WORK HOURS FROM START OF CONSTRUCTION		
	WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? <small>(If YES attach description of incident and proposed action.)</small>					
Schedule Activity No.	LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED			<input type="checkbox"/> SAFETY REQUIREMENTS HAVE BEEN MET.		
EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)						
Schedule Activity No.	Submittal #	Description of Equipment/Material Received				
CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.						
Schedule Activity No.	Owner	Description of Construction Equipment Used Today (incl Make and Model)			Hours Used	
Schedule Activity No.	REMARKS					
			_____ CONTRACTOR/SUPERINTENDENT		_____ DATE	

CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE _____

REPORT NO _____

PHASE	CONTRACT NO _____	CONTRACT TITLE _____
--------------	-------------------	----------------------

PREPARATORY	WAS PREPARATORY PHASE WORK PREFORMED TODAY? YES <input type="checkbox"/> NO <input type="checkbox"/>	
	IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.	
	Schedule Activity No.	Definable Feature of Work

Index #

INITIAL	WAS INITIAL PHASE WORK PREFORMED TODAY? YES <input type="checkbox"/> NO <input type="checkbox"/>	
	IF YES, FILL OUT AND ATTACH SUPPLEMENTAL INITIAL PHASE CHECKLIST.	
	Schedule Activity No.	Definable Feature of Work

Index #

FOLLOW-UP	WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES <input type="checkbox"/> NO <input type="checkbox"/>	
	WORK COMPLIES WITH SAFETY REQUIREMENTS? YES <input type="checkbox"/> NO <input type="checkbox"/>	
	Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)		REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)	
Schedule		Schedule	
Activity No.	Description	Activity No.	Description

REMARKS (Also Explain Any Follow-Up Phase Checklist Item From Above That Was Answered "NO"), Manuf. Rep On-Site, etc.	
Schedule	
Activity No.	Description

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.

AUTHORIZED QC MANAGER AT SITE

DATE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE _____

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT _____ GOVERNMENT QUALITY ASSURANCE MANAGER		_____ DATE
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PREPARATORY PHASE CHECKLIST		SPEC SECTION	DATE
(CONTINUED ON SECOND PAGE)			
CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
PERSONNEL PRESENT	GOVERNMENT REP NOTIFIED ____ HOURS IN ADVANCE: YES <input type="checkbox"/> NO <input type="checkbox"/>		
	NAME	POSITION	COMPANY/GOVERNMENT
SUBMITTALS	REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN APPROVED? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED? _____		
	ARE ALL MATERIALS ON HAND? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	IF NO, WHAT ITEMS ARE MISSING? _____		
CHECK APPROVED SUBMITTALS AGAINST DELIVERED MATERIAL. (THIS SHOULD BE DONE AS MATERIAL ARRIVES.)			
COMMENTS: _____			
MATERIAL STORAGE	ARE MATERIALS STORED PROPERLY? YES <input type="checkbox"/> NO <input type="checkbox"/>		
	IF NO, WHAT ACTION IS TAKEN? _____		
SPECIFICATIONS	REVIEW EACH PARAGRAPH OF SPECIFICATIONS.		
	DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK.		
CLARIFY ANY DIFFERENCES.			
PRELIMINARY WORK & PERMITS	ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.		
	IF NOT, WHAT ACTION IS TAKEN? _____		

PREPARATORY PHASE CHECKLIST

(CONTINUED FROM FIRST PAGE)

SPEC SECTION

DATE

CONTRACT NO

DEFINABLE FEATURE OF WORK

SCHEDULE ACT NO.

INDEX #

TESTING

IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM. _____

WHEN REQUIRED? _____

WHERE REQUIRED? _____

REVIEW TESTING PLAN. _____

HAS TEST FACILITIES BEEN APPROVED? _____

SAFETY

ACTIVITY HAZARD ANALYSIS APPROVED? YES NO

REVIEW APPLICABLE PORTION OF EM 385-1-1.

MEETING COMMENTS

NAVY/ROICC COMMENTS DURING MEETING.

OTHER ITEMS OR REMARKS

OTHER ITEMS OR REMARKS:

QC MANAGER

DATE

INITIAL PHASE CHECKLIST		SPEC SECTION	DATE
CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
PERSONNEL PRESENT	GOVERNMENT REP NOTIFIED ____ HOURS IN ADVANCE: YES <input type="checkbox"/> NO <input type="checkbox"/>		
	NAME	POSITION	COMPANY/GOVERNMENT
PROCEDURE COMPLIANCE	IDENTIFY FULL COMPLIANCE WITH PROCEDURES IDENTIFIED AT PREPARATORY. COORDINATE PLANS, SPECIFICATIONS, AND SUBMITTALS. COMMENTS: _____		
PRELIMINARY WORK	ENSURE PRELIMINARY WORK IS COMPLETE AND CORRECT. IF NOT, WHAT ACTION IS TAKEN? _____ _____		
WORKMANSHIP	ESTABLISH LEVEL OF WORKMANSHIP. WHERE IS WORK LOCATED? _____		
RESOLUTION	RESOLVE ANY DIFFERENCES. COMMENTS: _____		
CHECK SAFETY	REVIEW JOB CONDITIONS USING EM 385-1-1 AND JOB HAZARD ANALYSIS COMMENTS: _____		
OTHER	OTHER ITEMS OR REMARKS _____ _____		
_____ QC MANAGER		_____ DATE	

SECTION 01500N

TEMPORARY FACILITIES AND CONTROLS

02/03

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C511 (1997) Reduced-Pressure Principle
Backflow Prevention Assembly

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH
(FCCCHR)

FCCCHR Manual-9 Manual of Cross-Connection Control

FCCCHR List List of Approved Backflow Prevention
Assemblies

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

FHWA SA-89-006 (2000: Rev 1, 2001) Manual on Uniform
Traffic Control Devices

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2002) National Electrical Code

NFPA 241 (2000) Safeguarding Construction,
Alteration, and Demolition Operations

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. 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 01332 CONSTRUCTION SUBMITTAL PROCEDURES:

SD-03 Product Data

Backflow preventers

SD-06 Test Reports

Backflow Preventer Tests; G

SD-07 Certificates

Backflow Tester Certification; G

Backflow Preventers Certificate of Full Approval

1.3 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.3.1 Backflow Prevention Training Certificate

The Contractor shall submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

1.4 TEMPORARY UTILITIES

Reasonable amounts of the following utilities will be made available to the Contractor at the prevailing rates.

The point at which the Government will deliver such utilities or services and the quantity available is as indicated. The Contractor shall pay all costs incurred in connecting, converting, and transferring the utilities to the work. The Contractor shall make connections, including providing backflow-preventing devices on connections to domestic water lines; providing meters; and providing transformers; and make disconnections.

1.5 BACKFLOW TESTER CERTIFICATION

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the regulatory agency. Tester shall not be affiliated with any company participating in any other phase of this Contract.

1.6 WEATHER PROTECTION

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday.

Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

1.6.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions shall include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

1.6.1.1 Hurricane Condition of Readiness

Unless directed otherwise, comply with:

- a. Condition FOUR (Sustained winds of 93 km/hr (50 knots) or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than one m (4 feet) high. Remove all debris, trash, or objects that could become missile hazards. Contact Contracting Officer for Condition of Readiness (COR) updates and completion of required actions.
- b. Condition THREE (Sustained winds of 93 km/hr (50 knots) or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities, which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness. Contact Contracting Officer for weather and COR updates and completion of required actions.
- c. Condition TWO (Sustained winds of 93 km/hr (50 knots) or greater expected within 24 hours): Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact Contracting Officer for weather and Condition of Readiness (COR) updates and completion of required actions.
- d. Condition ONE. (Sustained winds of 93 km/hr (50 knots) or greater expected within 12 hours): Secure the jobsite, and leave Government premises.

1.7 STATION OPERATION AFFECT ON CONTRACTOR OPERATIONS

1.7.1 Restricted Access Areas

The Government will monitor work in areas as indicated. Notify Contracting Officer at least 14 calendar days prior to starting work in these areas.

1.7.2 Special Restrictions Regarding Access of Vehicles and Parking

1.7.2.1 Interruption of Vehicular Traffic

If during the performance of work, it becomes necessary to modify vehicular traffic patterns at any locations, notify the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a **Traffic Control Plan** detailing the proposed controls to traffic movement for approval. The plan shall be in accordance with State and local regulations and the **FHWA SA-89-006**, Part VI. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

1.8 STORAGE AREAS

Contractor shall be responsible for security of his property.

1.9 TEMPORARY SANITARY FACILITIES

Provide adequate sanitary conveniences of a type approved for the use of persons employed on the work, properly secluded from public observation, and maintained in such a manner as required and approved by the Contracting Officer. Maintain these conveniences at all times without nuisance. Upon completion of the work, remove the conveniences from the premises, leaving the premises clean and free from nuisance. Dispose of sewage through connection to a municipal, district, or station sanitary sewage system. Where such systems are not available, use chemical toilets or comparably effective units, and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Include provisions for pest control and elimination of odors.

1.10 TEMPORARY BUILDINGS

Temporary facilities (including trailers) shall be in like new condition. Locate these facilities where directed and within the indicated operations area. Storage of material/debris under such facilities is prohibited. Contractor shall be responsible for the security of the stored property.

1.10.1 Maintenance of Temporary Facilities

Suitably pain and maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

PART 2 PRODUCTS

2.1 BACKFLOW PREVENTERS

Reduced pressure principle type conforming to the applicable requirements [AWWA C511](#). Provide backflow preventers complete with 65 kg (150 pound) flanged cast iron, bronze or brass mounted gate valve and strainer, 304 stainless steel or bronze, internal parts. The particular make, model/design, and size of backflow preventers to be installed shall be included in the latest edition of the List of Approved Backflow Prevention Assemblies issued by the [FCCCHR List](#) and shall be accompanied by a Certificate of Full Approval from [FCCCHR List](#).

PART 3 EXECUTION

3.1 TEMPORARY PHYSICAL CONTROLS

3.1.1 Access Controls

3.1.1.1 Temporary Barricades

Contractor shall provide for barricading around all work areas to prevent public access.

3.1.1.2 Fencing

Fencing shall be provided along the construction site at all open excavations and tunnels to control access by unauthorized people. Fencing must be installed to be able to restrain a force of at least 114.00 kg (250 pounds) against it.

Enclose the project work area and Contractor lay-down area with a 2400 mm (8 ft) high chain link fence and gates with brown, UV light resistant, plastic fabric mesh netting (similar to tennis court or other screening). Remove the fence upon completion and acceptance of the work. Intent is to block (screen) public view of the construction.

In addition, prior to the start of work, enclose those areas at the construction site, which are not within the construction fence with a temporary safety fence, including gates and warning signs, to protect the public from construction activities. The safety fence shall match the base standard color (or bright orange where it protects excavated areas), shall be made of high density polyethylene grid or approved equal, a minimum of 1100 mm (42 inches) high, supported and tightly secured to steel posts located on minimum 3000 mm (10 foot) centers. Remove the fence from the work site upon completion of the contract.

3.1.1.3 Signs

Place warning signs at the construction area perimeter designating the presence of construction hazards requiring unauthorized persons to keep out. Signs must be placed on all sides of the project, with at least one sign every 90 m (300 feet). All points of entry shall have signs designating the construction site as a hard hat area.

3.1.1.4 Traffic Work

All work around/involving roadways, to include roadway excavations and utility crossings, will be conducted in accordance with Manual of Traffic Control Devices. Contractors shall provide and ensure appropriate road closure and detour signs are established as necessary for motor traffic management. All road closures shall be coordinated with the Contracting Officer in advance. Self-illuminated (lighted) barricades shall be provided during hours of darkness. Brightly colored (orange) vests are required for all personnel working in roadways. Road closures shall require a road closure plan showing the location of signage.

3.2 FOREIGN OBJECT DAMAGE (FOD)

Aircraft and aircraft engines are subject to FOD from debris and waste material lying on airfield pavements. Remove all such materials that may appear on operational aircraft pavements due to the Contractor's operations. If necessary, the Contracting Officer may require the Contractor to install a temporary barricade at the Contractor's expense to control the spread of FOD potential debris. The barricade shall consist of a fence covered with a fabric designed to stop the spread of debris; anchor the fence and fabric to prevent displacement by winds or jet/prop blasts. Remove barricade when no longer required.

3.3 TEMPORARY WIRING

Provide temporary wiring in accordance with [NFPA 241](#) and [NFPA 70](#), Article 305-6(b), Assured Equipment Grounding Conductor Program. Program shall include frequent inspection of all equipment and apparatus.

3.4 REDUCED PRESSURE BACKFLOW PREVENTERS

Provide an approved reduced pressure backflow prevention assembly at each location where the Contractor taps into the Government potable water supply.

A certified tester(s) shall perform testing of backflow preventer(s) for proper installation and operation and provide subsequent tagging. [Backflow preventer tests](#) shall be performed using test equipment, procedures, and certification forms conforming to those outlined in the latest edition of the Manual of Cross-Connection Control published by the [FCCCHR Manual-9](#). Test and tag each reduced pressure backflow

preventer upon initial installation (prior to continued water use) and quarterly thereafter. Tag shall contain the following information: make, model, serial number, dates of tests, results, maintenance performed, and signature of tester. Record test results on certification forms conforming to requirements cited earlier in this paragraph.

-- End of Section --

SECTION 01525

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

11/02

PART 1 GENERAL

This specification section contains minimum safety requirements for the contract. Incorporate additional safety requirements, as needed, to satisfy other State or Local regulatory requirements that are more stringent.

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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z359.1 (1999) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASME INTERNATIONAL (ASME)

ASME B30.5 (2000) Mobile and Locomotive Cranes

ASME B30.8 (2000) Floating Cranes and Floating Derricks

ASME B30.22 (2000) Articulating Boom Cranes

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

29 CFR 1910 Safety and Health Regulation in General Industry

29 CFR 1910.94 Ventilation

29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

29 CFR 1910.146 Permit-required Confined Spaces

29 CFR 1915 Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.62	Lead in Construction
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
29 CFR 1926.1101	Asbestos

U. S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) Safety and Health Requirements Manual
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NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(1998) Portable Fire Extinguishers
NFPA 70	(2002) National Electrical Code
NFPA 241	(2000) Safeguarding Construction, Alteration, and Demolition Operations

1.2 SUBMITTALS

Submit the following in accordance with Sections 01332, "Construction Submittal Procedures",

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

Activity Hazard Analysis (AHA); G

Crane Critical Lift Plan; G

SD-06 Test Reports

Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports

Monthly Exposure Reports

Regulatory Citations and Violations

Crane Reports

Certificate of Compliance (Crane)

SD-07 Certificates

Confined Space Entry Permit

Submit one copy of each permit attached to each Daily Quality Control Report.

1.3 DEFINITIONS

- a. Associate Safety Professional (ASP). An individual who is currently certified by the Board of Certified Safety Professionals.
- b. Certified Construction Health & Safety Technician (CHST). An individual who is currently certified by the Board of Certified Safety Professionals.
- c. Certified Industrial Hygienist (CIH). An individual who is currently certified by the American Board of Industrial Hygiene.
- d. Certified Safety Professional (CSP). An individual who is currently certified by the Board of Certified Safety Professionals.
- e. Certified Safety Trained Supervisor (STS). An individual who is currently certified by the Board of Certified Safety Professionals.
- f. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.
- g. Low-slope roof. A roof having a slope less than or equal to 4 in 12 (vertical to horizontal).
- h. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.
- i. Multi-Employer Work Site (MEWS). A multi-employer work site, as defined by OSHA, is one in which many employers occupy the same site. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors.
- j. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers, rigging gear

between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

k. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

- (1) Death, regardless of the time between the injury and death, or the length of the illness;
- (2) Days away from work;
- (3) Restricted work;
- (4) Transfer to another job;
- (5) Medical treatment beyond first aid;
- (6) Loss of consciousness; or
- (7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

l. Site Safety and Health Officer (SSHO). The superintendent or other qualified or competent person who is responsible for the on-site safety and health required for the project. The Contractor quality control (QC) person can be the SSHO on this project.

m. Steep roof. A roof having a slope greater than 4 in 12 (vertical to horizontal).

n. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

o. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the six 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; and collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1, and

all laws, ordinances, criteria, rules and regulations affecting construction. 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 shall apply.

1.5 DRUG PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employee uses illegal drugs or consumes alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test shall be made available to the Contracting Officer upon request.

1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Site Safety and Health Officer (SSHO) shall be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The SSHO shall meet the following requirements:

Level 2:

A minimum of 3 years safety work on similar project.
30-hour OSHA construction safety class or equivalent within last 3 years. Competent person training as needed.

1.6.1.2 Competent Person for Confined Space Entry

Provide a competent person meeting the requirements of EM 385-1-1 who is assigned in writing by the Designated Authority to assess confined spaces and who possesses demonstrated knowledge, skill and ability to:

- a. Identify the structure, location, and designation of confined and permit-required confined spaces where work is done;
- b. Calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;
- c. Perform all required tests and inspections specified in 29 CFR 1910.146 and 29 CFR 1915 Subpart B;
- d. Assess hazardous conditions including atmospheric hazards in confined space and adjacent spaces and specify the necessary protection and precautions to be taken;

- e. Determine ventilation requirements for confined space entries and operations;
- f. Assess hazards associated with hot work in confined and adjacent space and determine fire watch requirements; and,
- g. Maintain records required.

1.6.1.3 Competent Person for the Health Hazard Control and Respiratory Protection Program

Provide a competent person meeting the requirements of EM 385-1-1 who is:

- a. Capable by education, specialized training and/or experience of anticipating, recognizing, and evaluating employee exposure to hazardous chemical, physical and biological agents in accordance with USACE EM 385-1-1, Section 6.
- b. Capable of specifying necessary controls and protective actions to ensure worker health.

1.6.1.4 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Appendix G.

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)/Superintendent

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily quality control report.
- b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
- c. Maintain applicable safety reference material on the job site.
- d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
- e. Implement and enforce accepted APPS and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.

g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

a. The Contractor will be informed, in writing, of the date of the preconstruction conference. The purpose of the preconstruction conference is for the Contractor and the Contracting Officer's representatives to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall project's APP before the initiation of work.

b. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the AHAs and special plans, program and procedures associated with it).

c. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated activity hazard analyses (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's representative as to which phases will require an analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of AHAs shall be established to preclude project delays.

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

1.6.3.2 Weekly Safety Meetings

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

d. Health Hazard Control Program. The Contractor shall designate a competent and qualified person to establish and oversee a Health Hazard Control Program in accordance with USACE EM 385-1-1, Section 6. The program shall ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical and biological agents and that necessary controls and protective actions are instituted to ensure health.

e. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of crane hoist's maximum load limit; lifts involving more than one crane or hoist; lifts of personnel; and technically difficult lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks in accordance with USACE EM 385-1-1, paragraph 16.c.18. and submit 15 calendar days prior to on-site work.

f. Alcohol and Drug Abuse Plan

(1) Describe plan for random checks and testing with pre-employment screening in accordance with the DFAR Clause subpart 252.223-7004, "Drug Free Work Force."

(2) Description of the on-site prevention program

g. Fall Protection and Prevention (FP&P) Plan. The plan shall be site specific and address all fall hazards in the work place and during different phases of construction. It shall address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 1.8 m (6 feet). A qualified person shall prepare and sign the plan. The plan shall include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, rescue and escape equipment and operations, training requirements, and monitoring methods. Fall Protection and Prevention Plan shall be revised for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. The accepted Fall Protection and Prevention Plan shall be kept and maintained at the job site for the duration of the project.

h. Lead Abatement Plan. Also see "**Marine Corps Air Station Beaufort Contractor Information Packet For Compliance with**

Environmental Laws and Regulations". See attachment at the end of Section 01575.

- i. Lead Work Plan.
- j. Asbestos Hazard Abatement Plan. Also see **"Marine Corps Air Station Beaufort Contractor Information Packet For Compliance with Environmental Laws and Regulations"**. See attachment at the end of Section 01575.
- k. PCB Plan.
- l. Site Demolition Plan.
- m. Excavation Plan.
- n. Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, vehicle operator, forklift operators, personal protective equipment); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHA as amendments to the APP. An AHA will be developed by the Contractor for every operation involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or subcontractor is to perform work. The analysis must identify and evaluate hazards and outline the proposed methods and techniques for the safe completion of each phase of work. At a minimum, define activity being performed, sequence of work, specific safety and health hazards anticipated, control measures (to include personal protective equipment) to eliminate or reduce each hazard to acceptable levels, equipment to be used, inspection requirements, training requirements for all involved, and the competent person in charge of that phase of work. For work with fall hazards, including fall hazards associated with scaffold erection and removal, identify the appropriate fall arrest systems. For work with materials handling equipment, address safeguarding measures related to materials handling equipment. For work requiring excavations, include requirements for safeguarding excavations. An activity requiring an AHA shall not proceed until the AHA has been accepted by the Contracting Officer's representative and a meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activity, including on-site Government representatives. The Contractor shall document meeting attendance at the preparatory, initial, and follow-up phases of quality control inspection. The AHA shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations. The analysis should be used during daily inspections to

ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Activity hazard analyses shall be updated as necessary to provide an effective response to changing work conditions and activities. The on-site superintendent, site safety and health officer and competent persons used to develop the AHAs, including updates, shall sign and date the AHAs before they are implemented.

1.10 DISPLAY OF SAFETY INFORMATION

Within 2 calendar days after commencement of work, erect a safety bulletin board at the job site. The following information shall be displayed on the safety bulletin board in clear view of the on-site construction personnel, maintained current, and protected against the elements and unauthorized removal:

- a. Map denoting the route to the nearest emergency care facility.
- b. Emergency phone numbers.
- c. Copy of the most up-to-date APP.
- d. AHA(s).
- e. OSHA 300A Form.
- f. Confined space entry permit.
- g. A sign indicating the number of hours worked since last lost workday accident.
- h. OSHA Safety and Health Protection-On-The-Job Poster.
- i. Safety and Health Warning Posters.

1.11 SITE SAFETY REFERENCE MATERIALS

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

1.12 EMERGENCY MEDICAL TREATMENT

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

1.13 REPORTS

1.13.1 Accident Reports

a. For recordable injuries and illnesses, and property damage accidents resulting in at least \$2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the Navy Contractor Significant Incident Report (CSIR) form and provide the report to the Contracting Officer within 1 calendar day of the accident. The Contracting Officer will provide copies of any required or special forms.

b. For a weight handling equipment accident the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report form and provide the report to the Contracting Officer within 30 calendar days of the accident. The Contracting Officer will provide a blank copy of the accident report form.

1.13.2 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident involving a overturned crane, collapsed boom, or any other major damage to the crane or adjacent property. Information shall 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 (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on site and Government investigation is conducted.

1.13.3 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.13.4 Regulatory Citations and Violations

Contact the Contracting Officer immediately of any OSHA or other regulatory agency inspection or visit, and provide the Contracting Officer with a copy of each citation, report, and contractor response. Correct violations and citations promptly and provide written corrective actions to the Contracting Officer.

1.13.5 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

1.13.6 Certificate of Compliance

The Contractor shall provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). Certificate shall state that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance shall comply with 29 CFR 1926 and USACE EM 385-1-1 section 16 and Appendix H. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. The Contractor shall also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). These certifications shall be posted on the crane.

1.14 HOT WORK

Prior to performing "Hot Work" (welding, etc.) or operating other flame-producing devices, a written permit shall be requested from the Fire Division. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. The Contractor will provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity.

- a. Oil painting materials (paint, brushes, empty paint cans, etc.), and all flammable liquids shall be removed from the facility at quitting time. All painting materials and flammable liquids shall be stored outside in a suitable metal locker or box and will require re-submittal with non-hazardous materials.
- b. Accumulation of trays, paper, shavings, sawdust, boxes and other packing materials shall be removed from the facility at the close of each workday and such material disposed of in the proper containers located away from the facility.
- c. The storage of combustible supplies shall be a safe distance from structures.
- d. Area outside the facility undergoing work shall be cleaned of trash, paper, or other discarded combustibles at the close of each workday.
- e. All portable electric devices (saws, sanders, compressors, extension chord, lights, etc.) shall be disconnected at the close of each workday. When possible, the main electric switch in the facility shall be deactivated.

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

PART 2 PRODUCTS

2.1 FALL PROTECTION ANCHORAGE

Fall protection anchorage, conforming to ANSI Z359.1, will be left in place and so identified for continued customer use.

2.2 CONFINED SPACE SIGNAGE

The Contractor shall provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -" in bold letters a minimum of 25 mm(one inch) in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 1.52 m(5 feet).

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

The Contractor shall comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA, and other related submittals and activity fire and safety regulations.

3.1.1 Hazardous Material Use

Each hazardous material must receive approval 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. Any work or storage involving hazardous chemicals or materials must be done in a manner that will not expose Government or Contractor employees to any unsafe or unhealthful conditions. Adequate protective measures must be taken to prevent Government or Contractor employees from being exposed to any hazardous condition that could result from the work or storage. The Prime Contractor shall keep a complete inventory of hazardous materials brought onto the work-site. Approval by the Contracting Officer of protective measures and storage area is required prior to the start of the work.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing

ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If additional material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Contractors are required to apply for utility outages at least 15 days in advance. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, the Contractor shall attend a pre-outage coordination meeting with the Contracting Officer and the Station Utilities Department to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 FALL HAZARD PROTECTION AND PREVENTION

The Contractor shall establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. The program shall include company policy, identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and escape procedures.

3.3.1 Training

The Contractor shall institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, the Contractor shall provide training for each employee who might be

exposed to fall hazards. Training requirements shall be in accordance with USACE EM 385-1-1, section 21.A.16.

3.3.2 Fall Protection Equipment

The Contractor shall enforce use of the fall protection equipment designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is on a surface 1.8 m (6 feet) or more above lower levels. Fall protection systems such as guardrails, personnel fall arrest system, safety nets, etc., are required when working within 1.8m (6 feet) of any leading edge. In addition to the required fall protection systems, safety skiff, personal floatation devices, life rings etc., are required when working above or next to water in accordance with USACE EM 385-1-1, paragraphs 05.I. and 05.J. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems may be required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. Fall protection must comply with 29 CFR 1926.500, Subpart M and USACE EM 385-1-1.

3.3.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ANSI Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 1.8 m (6 feet). The total fall distance shall always be taken into consideration when attaching a person to a fall arrest system.

3.3.3 Fall Protection for Roofing Work

Fall protection controls shall be implemented based on the type of roof being constructed and work being performed. The roof area to be accessed shall be evaluated for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

- (1) For work within 1.8 m (6 feet) of an edge, on low-slope roofs, personnel shall be protected from falling by use of personal fall arrest systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized.

(2) For work greater than 1.8 m (6 feet) from an edge, warning lines shall be erected and installed in accordance with 29 CFR 1926.500 and USACE EM 385-1-1.

b. Steep Roofs: Work on steep roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

3.3.4 Safety Nets

If safety nets are used as the selected fall protection system on the project, they shall be provided at unguarded workplaces, over water, machinery, dangerous operations and leading edge work. Safety nets shall be tested immediately after installation with a drop test of 181.4 kg (400 pounds) and every six months thereafter.

3.3.5 Existing Anchorage

Existing anchorages, to be used for attachment of personal fall arrest equipment, shall be certified (or re-certified) by a qualified person in accordance with ANSI Z359.1.

3.3.6 Horizontal Lifelines

Horizontal lifelines shall be designed, installed, certified and used under the supervision of a qualified person as part of a complete fall arrest system (29 CFR 1926.500).

3.5 SCAFFOLDING

Employees shall be provided with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Access to scaffold platforms greater than 6 m (20 feet) in height shall be accessed by use of a scaffold stair system. Vertical ladders commonly provided by scaffold system manufacturers shall not be used for accessing scaffold platforms greater than 6 m (20 feet) in height. The use of an adequate gate is required. Contractor shall ensure that employees are qualified to perform scaffold erection and dismantling. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward. Special care shall be given to ensure scaffold systems are not overloaded. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material is prohibited. The first tie-in shall be at the height equal to 4 times the width of the smallest dimension of the scaffold base. Work platforms shall be placed on mud sills. Scaffold or work platform erectors shall have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet. Delineate fall protection requirements when working above six feet or above dangerous operations

in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment

- a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.
- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.
- c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.6.2 Weight Handling Equipment

- a. Cranes must be equipped with:
 - (1) Load indicating devices (LIDs) and a boom angle or radius indicator,
 - (2) or load moment indicating devices (LMIs).
 - (3) Anti-two block prevention devices.
 - (4) Boom hoist hydraulic relief valve, disconnect, or shutoff (stops hoist when boom reaches a predetermined high angle).
 - (5) Boom length indicator (for telescoping booms).
 - (6) Device to prevent uncontrolled lowering of a telescoping hydraulic boom.
 - (7) Device to prevent uncontrolled retraction of a telescoping hydraulic boom.
- b. The Contractor shall notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.
- c. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person (as defined in ASME B30.5). All testing shall be performed in accordance with the manufacturer's recommended procedures.

- d. The Contractor shall comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes and ASME B30.8 for floating cranes and floating derricks.
- e. The presence of Government personnel does not relieve the Contractor of an obligation to comply with all applicable safety regulations. The Government will investigate all complaints of unsafe or unhealthful working conditions received in writing from contractor employees, federal civilian employees, or military personnel.
- f. Each load shall be rigged/attached independently to the hook/master-link in such a fashion that the load cannot slide or otherwise become detached. Christmas-tree lifting (multiple rigged materials) is not allowed.
- g. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.
- h. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11 and ASME B30.5 or ASME B30.22 as applicable.
- i. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.
- j. A fire extinguisher having a minimum rating of 10BC and a minimum nominal capacity of 5lb of extinguishing agent shall be available at all operator stations or crane cabs. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.
- k. All employees shall be kept clear of loads about to be lifted and of suspended loads.
- l. A weight handling equipment operator shall not leave his position at the controls while a load is suspended.
- m. Only Contractor crane operators who have met the requirements of 29 CFR 1910.94, 29 CFR 1910.120, 29 CFR 1926.65, 29 CFR 1926.500, USACE EM 385-1-1, ASME B30.5, and ASME B30.22 and other local and state requirements shall be authorized to operate the crane.
- n. The Contractor shall use cribbing when performing lifts on outriggers.
- o. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

- p. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.
- q. A substantial and durable rating chart containing legible letters and figures shall be provided with each crane and securely mounted onto the crane cab in a location allowing easy reading by the operator while seated in the control station.
- r. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.
- s. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.
- t. The Contractor shall certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.6.3 Equipment and Mechanized Equipment

- a. Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review.
- b. Manufacture specifications or owner's manual for the equipment shall be on site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Such additional safety precautions or requirements shall be incorporated into the AHAs.
- c. Equipment and mechanized equipment shall be inspected in accordance with manufacturer's recommendations for safe operation by a competent person prior to being placed into use.
- d. Daily checks or tests shall be conducted and documented on equipment and mechanized equipment by designated competent persons.

3.7 EXCAVATIONS

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect, and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly.

3.7.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.7.2 Utility Location Verification

The Contractor must physically verify underground utility locations 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. Digging within .061 m (2 feet) of a known utility must not be performed by means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility the utility shall be exposed by hand digging every 30.5 m (100 feet) if parallel within 1.5 m (5 feet) of the excavation.

3.7.3 Utilities with Concrete Slabs

Utilities located within concrete slabs or pier decks, bridges, and the like are extremely difficult to identify. The location must be coordinated with station utility departments in addition to a private locating service. Outages on system utilities shall be used in circumstances where concrete chipping, saw cutting, or core drilling is required and utilities are unable to be completely identified.

3.7.4 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on site for review. Job-made shoring or shielding shall have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

3.7.5 Trenching Machinery

Trenching machines with digging chain drives shall be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers shall be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training shall be kept on file at the project site.

3.8 ELECTRICAL

3.8.1 Conduct of Electrical Work

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. Positive

cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. Insulating blankets, hearing protection, and switching suits may be required, depending on the specific job and as delineated in the Contractor's AHA.

3.8.2 Portable Extension Cords

Portable extension cords shall be sized in accordance with manufacturer ratings for the tool to be powered and protected from damage. All damaged extension cords shall be immediately removed from service. Portable extension cords shall meet the requirements of NFPA 70.

3.9 WORK IN CONFINED SPACES

The Contractor shall comply with the requirements in Section 06.I of USACE EM 385-1-1 and OSHA 29 CFR 1910.146. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.05 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

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

c. Ensure the use of rescue and retrieval devices in confined spaces greater than 1.5 m (5 feet) in depth. Conform to Sections 06.I.09, 06.I.10 and 06.I.11 of USACE EM 385-1-1.

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

e. Include training information for employees who will be involved as entrants and attendants for the work. Conform to Section 06.I.06 of USACE EM 385-1-1.

f. Daily Entry Permit. Post the permit in a conspicuous place close to the confined space entrance.

3.10 CRYSTALLINE SILICA

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

3.11 HOUSEKEEPING

3.11.1 Clean-Up

All debris in work areas shall be cleaned up daily or more frequently if necessary. Construction debris may be temporarily located in an approved location, however garbage accumulation must be removed each day.

3.11.2 Dust control

In addition to the dust control measures required elsewhere in the contract documents, dry cutting of brick or masonry shall be prohibited. Wet cutting must address control of water run off.

-- End of Section --

SECTION 01572N

WASTE MANAGEMENT
10/01

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Construction and Demolition Waste

Solid wastes such as building materials, packaging and rubble resulting from construction, remodeling, demolition and repair of buildings/facilities, paving and infrastructure.

1.1.2 Recyclable Materials

Products and materials that can be recovered and remanufactured into a new product. Recyclable materials include, but are not limited to, the following:

- a. Metals (ferrous and non-ferrous), including banding, metal studs, ductwork, piping
- b. Asphaltic concrete paving
- c. Portland cement concrete
- d. Gypsum products
- e. Paper and cardboard
- f. Wood products, including structural, finish, crates and pallets
- g. Brick and masonry
- h. Carpet and padding
- i. Plastics
- j. Copper wiring

1.1.3 Recycling Facility

A business that specializes in collecting, handling, processing, distributing, or remanufacturing waste materials generated by demolition and new construction projects, into products or materials that can be used for this project or by others.

1.1.4 Salvage and Reuse

Existing usable product or material that can be saved and reused in some manner on the project site. Materials for reuse must be approved by the Contracting Officer. Materials that can be salvaged and reused must comply with the applicable technical specifications and include, but are not limited to, the following:

- a. Dimensional lumber and other wood products
- b. Structural steel
- c. Soil
- d. Masonry products
- e. Plants

1.1.5 Salvage for Resale

Existing usable product or material that can be saved and removed intact (as is) from the project site to another site for resale to others without remanufacturing.

1.2 SUBMITTALS

Submit the following in accordance with Sections 01332, "Construction Submittal Procedures",

SD-01 Preconstruction Submittals

Waste Management Plan; G

1.3 CONSTRUCTION WASTE MANAGEMENT

1.3.1 General Intent

The Contractor shall use all means available to divert to the greatest extent practical and economically feasible, construction and demolition waste from landfills and incinerators.

1.3.2 Construction Waste Management Operations

Take a pro-active, responsible role in management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Establish a construction waste management program that includes the following categories:

- a. Minimizing Packaging Waste
- b. Salvage and reuse

- c. Salvage for resale or donation
- d. Recycling
- e. Disposal

A diligent effort shall be made to salvage and reuse products and materials. Waste materials that cannot be salvaged and reused, and have value as being recyclable, shall be recycled. Only materials unable to be economically salvaged or recycled shall be transported to a landfill or incinerator. The Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling construction waste for this project. Revenues or other savings obtained for recycling or returns shall accrue to the Contractor, except revenues generated from Base recycling activities.

1.3.3 Construction Waste Management Plan

Perform a waste analysis to determine the types and quantity of construction waste anticipated and identify salvage for resale, salvage and reuse, recycling and disposal options available. After receipt of written authorization to proceed with the specific construction and prior to performing any demolition work, submit a [Waste Management Plan](#) for review and approval. The Waste Management Plan shall include the following:

- a. Projected quantity and cost of disposing of all waste materials as if there would be no salvage or recycling on this project.
- b. A list of waste materials that will be salvaged for resale, salvaged and reused, and recycled.
- c. Anticipated net cost savings determined by subtracting the cost of handling and transporting from the following:
 - (1) Savings due to reuse of demolished materials.
 - (2) Revenue from the sale of salvaged and recycled materials.
 - (3) Landfill or incinerator tipping fees saved due to diversion of materials to recycling.
- d. Name, address and phone number for each landfill or incinerator facility to be utilized.
- e. Tipping fee for each landfill or incinerator.
- f. Identification of each recycling facility to be utilized and means of transportation.

- g. Description of the method to be employed in recycling waste materials and description of the method that will be used to protect recycled materials from contamination.

An acceptable waste management plan format is available at <http://www.efdlant.navfac.navy.mil/criteria/GuideSpecs/graphiconly/Agraphics.htm>(go to GRAPHICS). Other formats providing the above information are also acceptable.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PROGRAM IMPLEMENTATION AND MONITORING

Implement and maintain, for the duration of the project, the construction waste management program. Establish a method of monitoring and documenting the program, and submit a periodic report with each application for payment that includes the following:

- a. Amount (by weight) and type of waste materials disposed of in a landfill or incinerator, the tip fee per ton, and the total cost of disposal including transportation costs, container rental costs, etc.
- b. Amount (by weight) and type of materials salvaged for sale, salvaged for reuse, and recycled. Provide destination, means of transportation, cost of transportation and handling, tipping fee savings and revenue generated for each material.
- c. Cost savings due to salvaging, reusing, and recycling materials.

3.1.1 Hazardous Materials/Hazardous Wastes

If any non-acceptable materials such as hazardous materials or hazardous wastes are encountered, notify the Contracting Officer.

3.2 SALVAGE AND REUSE

Encourage the practice of efficient waste reduction and waste management when sizing, cutting, and installing products and materials.

3.3 SEPARATION OF RECYCLABLE WASTE MATERIALS

Provide the necessary containers and bins, to facilitate the waste management program, that are clearly and appropriately marked. Prevent contamination of recyclable materials from incompatible products and materials. Separate construction waste at the project site by one of the following methods:

- a. Source Separated Method: Waste products and materials, that are recyclable, are separated from trash and sorted into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Trash is transported to a landfill or incinerator.
- b. Co-Mingled Method: All construction waste is placed into a single container and then transported to a recycling facility where the recyclable materials are sorted and processed and the remaining trash is transported to a landfill or incinerator.
- c. Other methods proposed by the Contractor and approved by the Contracting Officer.

-- End of Section --

SECTION 01575N

TEMPORARY ENVIRONMENTAL CONTROLS

04/03

PART 1 GENERAL

1.1 REFERENCES

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

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

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.1200	Hazard Communication
40 CFR 112	Oil Pollution Prevention
40 CFR 122.26	EPA National Pollutant Discharge Elimination System Permit Regulations
40 CFR 173	Procedures Governing the Rescission of State Primary Enforcement Responsibility for Pesticide Use Violations
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 Systems: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Generators of Hazardous Waste
40 CFR 263	Transporters of Hazardous Waste
40 CFR 264	Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 265	Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administrated 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	Universal Waste Management
40 CFR 279	Used Oil Regulations
40 CFR 280	Owners and Operators of Underground Storage Tanks
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification
40 CFR 372-SUBPART D	EPA Toxic Chemical Release Reporting Regulations
40 CFR 716	Health and Safety Data Reporting
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 173	Shipments and Packagings
49 CFR 178	Packagings
U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)	
EPA SW-846	(1996) Evaluating Solid Waste (Physical/Chemical Methods)
EPA 832-R-92-005	Storm Water Management for Construction Activities

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

Discarded material (except hazardous waste, hazardous construction debris, regulated waste, and industrial waste as defined in paragraphs entitled "Hazardous Waste", "Hazardous Construction Debris", "Regulated Waste" and "Industrial Waste", including solid, liquid, semisolid, or contained gaseous materials.

- 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. Construction and Demolition Debris

Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 60 mm 2.5 inch particle size that is: a manufactured object or natural geologic material (e.g. cobbles and boulders). A mixture of debris and other material such as soil or sludge is also subject to regulation as construction and demolition debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1. 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.
2. Inert construction and demolition debris: Broken or removed concrete, masonry products, asphalt paving materials; ceramics; roofing paper and shingles. Inert materials may not be re-inforced with or contain ferrous wire, rods, accessories and weldments.
3. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard, pallets, dunnage, and formwork. Wood painted with lead based paint is not included unless the waste stream determination indicates that the wastes are non-hazardous.
4. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as re-enforcing steel, structural shapes, pipe and wire,

banding straps, fasteners, shipping spreaders, door and window frames that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included, except where specific exemptions allow recycling.

5. Empty cans: Metal or plastic cans that are empty of chemicals, paints, solvents, thinners, and adhesives. A container is empty if all contents have been removed using practices commonly employed to remove materials from that type container, e.g., pouring, pumping, and aspirating. Air drying of cans is not permitted. Aerosol cans are not included if pressurized.
6. Recyclables/Reusable Material: 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 not 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.

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.

Where state or local regulatory definitions for waste differ from those stated in this section, the state or local definitions shall be used for this contract.

1.2.3 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.4 Hazardous Waste

A waste as defined in 40 CFR 261; or as defined by applicable State and local regulations. May include, but is not limited to, hazardous construction and demolition debris, unusable special coatings, lead containing paint, spent solvents, and rags contaminated with hazardous materials.

1.2.4.1 Hazardous Construction and Demolition Debris

As defined in paragraph entitled "Construction and Demolition Debris" of this section, 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.

1.2.4.2 Universal Waste

Specific hazardous wastes defined by 40 CFR 273 or by applicable State and local regulations. The categories of these wastes are Batteries, Pesticides, Thermostats, and Lamps. Common items that are managed as Universal Wastes include, but is not limited to, spent lead-acid batteries, nickel-cadmium rechargeable batteries, NiMH (nickel-metal-hydride) batteries, lithium ion batteries, fluorescent lamps, high intensity discharge lamps, neon lamps, mercury vapor lamps, high pressure sodium lamps, metal halide lamps, and thermostats containing mercury ampoules.

1.2.5 Industrial Wastes

Solid waste or waste by-products containing hazardous constituents that are generated incidental to or derived from construction and demolition activities. Items included in this category include, but are not limited to, used rags, cleaning materials and residue, used protective sheeting (paper or plastic), unusable partially filled paint cans or coating containers, paint brushes and rollers, disposable personal protective equipment (PPE) not used in asbestos or lead removal, and non-hazardous pressurized aerosol cans. This category does not include construction and demolition debris or any other discarded materials designated as regulated waste or hazardous waste.

1.2.5.1 Petroleum Contaminated Waste

Surface water, groundwater, soil, or sediment that has the presence of petroleum or petroleum products or their chemical constituents (except hazardous waste as defined in the paragraph entitled "Hazardous Waste") in quantities that exceed the applicable cleanup target levels.

1.2.6 Regulated Waste

Those wastes, other than Hazardous Wastes and Industrial Wastes, that have specific additional Federal, state, or local regulatory requirements for handling, storage, or disposal. Includes, but is not limited to, asbestos containing materials and PCB contaminated materials.

1.2.7 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-213 (CFC-213)
chlorofluorocarbon-12 (CFC-12)	chlorofluorocarbon-214 (CFC-214)
chlorofluorocarbon-13 (CFC-13)	chlorofluorocarbon-215 (CFC-215)
chlorofluorocarbon-111 (CFC-111)	chlorofluorocarbon-216 (CFC-216)
chlorofluorocarbon-112 (CFC-112)	chlorofluorocarbon-217 (CFC-217)
chlorofluorocarbon-113 (CFC-113)	halon-1211

Stormwater Pollution Prevention Plan; G

Erosion and sediment control inspection reports

Stormwater, Erosion, and Sedimentation Control Inspector Training Certificate; G

Inspection Field Report(s) and Construction Completion Certification; G

SD-11 Closeout Submittals

Disposal documentation for Hazardous and Regulated Waste; G

Notice of Termination; G

Environmental Records Binder; G

1.4 REPORTS

1.4.1 Pre-construction Survey

Perform a pre-construction survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions on and adjacent to the site. Include this survey as a part of the Environmental Protection Plan as prescribed elsewhere in this section.

1.4.2 DIRT AND DUST CONTROL PLAN

Prepare a map showing truck and material haul routes along with a plan for controlling and removing dirt and debris from base roadways. As a minimum, identify in the plan the equipment to be used for cleaning along the haul route and measures to reduce dirt and debris accumulation on roadways. Identify who is responsible for cleaning up dirt and debris. Identify other operations that will generate dust and describe the controls planned for dust control. Include this plan as a part of the Environmental Protection Plan as prescribed elsewhere in this section.

1.4.3 Certifying Professional Engineer Data

Submit the name, address, telephone number, registration number, and state of registration for all Professional Engineers that will inspect and certify work performed under this contract. Certifications include, but are not limited to, construction permits completion certificate.

1.4.4 Licenses and Permits

Submit copies of all licenses and permits obtained for this project, including related correspondence, to the Contracting Officer. Related

correspondence includes, but is not limited to, application forms, drawings, and letters from appropriate agencies.

1.4.5 HAZARDOUS MATERIALS LIST

The Contractor is required by specification section 01525, entitled "Safety and Occupational Health Requirements", to prepare and include in the Accident Prevention Plan an inventory of Hazardous Materials to be used during this contract with estimated quantities and copies of Material Safety Data Sheets (MSDS). This data shall be called the Hazardous Materials List, submit this list for approval prior to bringing hazardous materials on-base.

1.4.6 Waste Stream Determination Documentation

The Contractor shall complete a Waste Stream Determination form or Waste Profile for all wastes to be generated. (Copies of forms are attached at the end of this section. If there are base specific forms, they will be provided at the pre-construction conference.) Waste stream determinations are required at the point of generation and must sufficiently document whether the waste will be a solid waste, hazardous waste, industrial waste, or regulated waste. The waste stream determination must be based upon the following: a constituent listing from the manufacturer or visual identification of waste, combined with consideration of the process by which the waste was generated and any laboratory analysis necessary to complete the determination. Material Safety Data Sheets (MSDS) by themselves are not adequate. The Contractor shall bear the cost of the waste stream determinations.

A Waste Determination form must be provided for wastes resulting from construction, renovation, and demolition activities and/or the use of products such as the following (this listing is not all inclusive): oil and latex based paints and caulking, solvents, adhesives, aerosols, petroleum based materials, and all original product containers.

1.4.6.1 Laboratory Analysis and Accreditation Certificate/License

Submit a copy of a laboratory analysis of waste and debris used to support any waste determination. Analysis must use EPA approved methods. Laboratories shall be accredited by the appropriate national accreditation authority described in section 01450, entitled "Quality Control" and licensed in the jurisdiction where the work is to be performed if required by state or local regulation. Submit the certificate of accreditation and license to the Contracting Officer for approval.

1.4.7 Solid Waste Disposal Permit

Submit one copy of a permit or license showing the appropriate agency(s) approval of the disposal plan before transporting wastes off Government property.

1.4.8 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 shall 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 shall 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 shall include training requirements as defined in 40 CFR 265 for a Large Quantity Generator facility. Submit these training records prior to the start of the activity requiring the training.

1.4.9 Regulatory Notification

The Contractor is responsible for all regulatory notification requirements in accordance with Federal, State and local regulations and permits obtained by the Contractor and Contracting Officer. The Contractor shall submit notification documents via the Contracting Officer to regulatory agencies, allowing the appropriate agency processing time prior to the scheduled commencement of work activities and 5 additional days for the Contracting Officer. 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), the installation of or removal of petroleum storage tank systems, and the installation, replacement, or removal of equipment that generate air emissions, such as paint booths, boilers, emergency generators, etc.

1.4.10 Solid Waste Disposal Report

Monthly the Contractor shall submit a solid waste disposal report to the Contracting Officer. For each waste stream, the report shall state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste. The Contractor shall 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, signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification shall 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 own use, the Contractor shall submit on the solid waste disposal report the information previously described in this paragraph. Prices paid or received shall not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

1.4.11 CONTRACTOR HAZARDOUS MATERIAL INVENTORY LOG

Submit a "Contractor Hazardous Material Inventory Log" to the Contracting Officer on the 10th day of each month for the preceding month. (Copies of forms are attached at the end of this section. If there are base specific forms, they will be provided at the pre-construction conference.) This form provides information required by the Environmental Protection Community Right-to-Know Act (EPCRA). Attach a copy of the Material Safety Data Sheet (MSDS) for each item listed and maintain a file copy of these logs and MSDSs at the job-site at all times in the Environmental Records Binder.

Submit a copy of all previous logs and MSDSs at the end of construction, or December 31 of each calendar year during the life of the contract which ever comes first.

Hazardous Materials are defined in paragraph 1 of this section. Typical types of materials requiring MSDSs and quantity reporting include, but are not limited to, acids, adhesives, alkalis/bases/caustics, cleaning compounds, compressed gases, corrosion prevention compounds, detergents/soaps, greases, hydraulic fluids, inspection penetrants, lubricants /oils, paint materials, polish/wax compounds, solvents, water test/treatment chemicals, oxidizers, fuels, batteries, pesticides, aerosol can products, admixtures, curing compounds, and other petroleum-based products.

Comply with "**Marine Corps Air Station Beaufort Contractor Information Packet For Compliance with Environmental Laws and Regulations**". See attachment at the end of this section. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

1.4.12 Storm Water Pollution Prevention Plan (SWPPP)

Prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) to meet the requirements of the State of South Carolina general permit for storm water discharges from construction sites.

Submit the SWPPP along with any required Notice of Intent (NOI), via the Contracting Officer, to the appropriate State agency for approval, a minimum of 10 calendar days prior to the start of construction.

The approved SWPPP shall become a part of the Environmental Protection Plan prescribed elsewhere in this section and shall be kept at the construction on-site office. Continually update the SWPPP as regulations require to reflect current site conditions.

Submit Notice of Termination (NOT), via the Contracting Officer, to the appropriate State agency for approval, after completion of soil disturbing activities and final stabilization is achieved, but prior to final acceptance.

1.4.12.1 Erosion and Sediment Control Inspection Reports

Submit "Erosion and Sediment Control Inspection Reports" (copies of the form is attached at the end of this section or base specific forms

will be provided at the pre-construction conference) to the Contracting Officer once every 7 calendar days and within 24 hours of a storm event that produces 12 mm 0.5 inch or more of rain. Inspections shall be performed by a State trained and certified Stormwater, Erosion, and Sedimentation Control Inspector.

1.4.13 Disposal Documentation for Hazardous and Regulated Waste

Submit a copy of the applicable EPA and State permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities.

1.5 ENVIRONMENTAL RECORDS BINDER

Maintain on-site, a separate three-ring binder(s) with approved copies of all submittals required in this section and submit at the completion of construction.

1.6 CLASS I ODS PROHIBITION

Class I 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.

1.7 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during 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.

1.7.1 Facility Hazardous Waste Generator Status

MCAS Beaufort, sc is designated as a Large Quantity Generator. All work conducted within the boundaries of this activity must meet the regulatory requirements of this generator designation. The Contractor will 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.

1.7.2 Licenses and Permits

Obtain licenses and permits pursuant to the "Permits and Responsibilities" FAR Clause except for the following permits which will be obtained by the Contracting Officer:

None.

For Contractor obtained permits, submit all permit applications, via the Contracting Officer, to the applicable Federal, State, or Local agency.

The Contractor shall submit start of construction notifications, perform quality control inspections of the work in progress, and submit construction completion certifications to the applicable regulatory agency, via the Contracting Officer, for all permits, including those obtained by the government.

The inspections and construction completion certifications shall be provided through the services of a Professional Engineer, registered in the State where the work is being performed. The Certifying Engineer shall prepare a Field Report for each inspection and submit to the Contracting Officer as an attachment to the Contractors Production Report.

Each permit shall be a Definable Feature of Work (DFOW) and shall be included in the Network Analysis Schedule. The scheduled activities shall include, but not be limited to, application preparation and submission, government review and agency processing time, regulatory notifications, Certifying Engineer inspections, and construction completion certification submission.

1.7.3 Contractor Liabilities for Environmental Protection

The Contractor is advised that this project and the station are subject to Federal, State, and local regulatory agency inspections to review compliance with environmental laws and regulations. The Contractor will fully cooperate with any representative from any Federal, State or local regulatory agency who may visit the job site and will provide immediate notification to the Contracting Officer, who will accompany them on any subsequent site inspections. The Contractor will complete, maintain, and make available to the Contracting Officer, station, or regulatory agency personnel all documentation relating to environmental compliance under applicable Federal, State and local laws and regulations. The Contractor will immediately notify the Contracting Officer if a Notice of Violation (NOV) is issued to the Contractor.

The Contractor will be responsible for all damages to persons or property resulting from Contractor fault or negligence as well as for the payment of any civil fines or penalties which may be assessed by any Federal, State or local regulatory agency as a result of the Contractor's or any subcontractor's violation of any applicable Federal, State or local environmental law or regulation. Should a Notice of Violation (NOV), Notice of Noncompliance (NON), Notice of Deficiency (NOD), or similar regulatory agency notice be issued to the Government as facility owner/operator on account of the actions or inactions of the Contractor or one of its subcontractors in the performance of work under this contract, the Contractor will fully cooperate with the Government in defending against regulatory assessment of any civil fines or penalties arising out of such actions or inactions.

1.8 ENVIRONMENTAL MANAGER

The Contractor shall appoint in writing an Environmental Manager for the project site. The Environmental Manager shall be directly responsible for coordinating contractor compliance with Federal, State, local, and activity environmental requirements. This can be a collateral position; however the person in this position must be trained to adequately accomplish the following duties:

The Environmental Manager shall implement the Environmental Protection Plan; ensure that all environmental permits are obtained, complied with, and closed out; ensure compliance with Storm Water Management regulations and inspection requirements; ensure compliance with Hazardous Materials storage, handling, and reporting requirements; and shall coordinate any remediation of regulated substances (lead, asbestos, PCB, etc).

The Environmental Manager shall ensure waste segregation and storage compatibility requirements are met; ensure compliance with Hazardous Waste identification, handling, storage, manifesting, and disposal requirements; inspect and manage Waste Accumulation areas, if required; ensure only authorized personnel add wastes to containers; ensure all Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; and coordinate removal of waste containers.

The Environmental Manager shall maintain the Environmental Records binder.

1.9 ENVIRONMENTAL PROTECTION PLAN

Meet with the Contracting Officer to discuss the proposed Environmental Protection 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 Environmental Protection Plan will be submitted in the following format and will, at a minimum, address the following elements (also refer to paragraph entitled "Protection of Natural Resources" in this section):

- a. Description of the Environmental Protection Plan
 - (1) General overview and purpose
 - (2) General site information, include
Pre-Construction site survey
 - (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. Protection 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, address the following as a minimum:
- (1) Ground cover
 - (2) Erodible soils
 - (3) Temporary measures
 - (a) Mechanical retardation and control of runoff
 - (b) Vegetation and mulch
- e. Include the approved Stormwater Pollution Prevention Plan (SWPPP), prescribed elsewhere in this section, here. The plan shall follow the appropriate regulatory agency format and contain, at a minimum, the following:
- (1) Description of the site and potential sources of pollution which may be reasonably expected to affect the quality of storm water discharge from the site.
 - (2) A map showing site drainage, discharge points, location of control measures.
 - (3) Describe the control measures to be used. Use "Best Management Practices" (BMP) from EPA 832-R-92-005
 - (4) Describe the inspection procedures and reports. Provide the name and phone number of the trained and certified Stormwater, Erosion, and Sedimentation Control Inspector that will be used for this project.

- (5) Describe maintenance procedures for control measures during the life of the contract.

f. Dirt and Dust Control

Include the approved Dirt and Dust Control Plan here.

g. Prevention of Spills and Releases to the Environment

- (1) Procedures to prevent spills and releases to the environment
- (2) Notifications in the event of a spill or release to the environment

h. Pollution Prevention and Hazardous Waste minimization

- (1) Procedures to reduce potential for Hazardous Waste generation.
- (2) Protection of the Environment from Waste generated during Construction/Renovation and Demolition Operations

a. Control and disposal of solid waste

b. Control and disposal of construction and demolition debris

c. Control and disposal of Hazardous Waste, Universal Waste, and Hazardous Construction and Demolition Debris (see Hazardous Waste Management Section).

This item shall consist of the management procedures for all hazardous waste to be generated. As a minimum, include the following:

- (1) Procedures to be employed to ensure a written waste stream determination or waste profile is made for all wastes which are to be generated
- (2) Sampling/analysis plan for waste stream determination
- (3) Methods of accumulation (i.e., in tanks and/or containers) and designation of individual responsible for waste accumulation sites
- (4) Management procedures for identification, storage, labeling, transportation, and disposal of hazardous waste and universal waste (treatment of waste is not allowed unless specifically noted)
- (5) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)
- (6) Management procedures for recyclable hazardous materials

- (7) Used oil and used oil filter management procedures in accordance with 40 CFR 279
- (8) Plans for the disposal of hazardous waste by permitted facilities
- (9) Procedures to be employed to ensure all required employee training records are maintained
- (d) Control and disposal of Industrial Waste, including petroleum contaminated waste
- (e) Control and disposal of Regulated Waste

1.9.1 Environmental Protection Plan Review

Fourteen days after the environmental protection plan meeting, submit the proposed Environmental Protection Plan for further discussion, review, and approval. Commencement of work will not begin until the environmental protection plan has been approved.

1.10 UNFORESEEN HAZARDOUS OR REGULATED MATERIAL

If material that is not indicated in the contract documents is encountered that may be dangerous to human health upon disturbance during construction operations, stop that portion of work and notify the Contracting Officer immediately. Intent is to identify materials such as PCB, lead paint, mercury, petroleum products, and friable and non-friable asbestos. 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."

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified.

3.2 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. 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.

3.3 EROSION AND SEDIMENT CONTROL MEASURES

3.3.1 Burnoff

Burnoff of the ground cover is not permitted.

3.3.2 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.

3.3.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

3.3.3.1 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. Also see "**Marine Corps Air Station Beaufort Contractor Information Packet For Compliance with Environmental Laws and Regulations**". See attachment at the end of Section 01575.

3.3.3.3 Vegetation and Mulch

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.

- a. 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.

concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.14 ABRASIVE BLASTING

3.14.1 Blasting Operations

The use of silica sand is prohibited in sandblasting.

Provide tarpaulin drop cloths and windscreens to enclose abrasive blasting operations to confine and collect dust, abrasive, agent, paint chips, and other debris. Perform work involving removal of hazardous material in accordance with 29 CFR 1910.

3.14.2 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 will be managed in accordance with paragraph entitled "Hazardous Waste/Debris and Universal Waste Management" of this section and with the approved Environmental Protection Plan. Disposal of non-hazardous abrasive blasting debris will be in accordance with paragraph entitled, "Control and Disposal of Solid Wastes" of this section.

3.15 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. Confine pile-driving operations to the period between 8 a.m. and 4 p.m., Monday through Friday, exclusive of holidays, unless otherwise specified.

---END OF SECTION---

As contractors aboard the installation, your commitment to strict compliance with environmental laws and regulations will assist MCAS Beaufort in providing the best possible training facilities for today's Marines and Sailors while honoring our environmental responsibilities and objectives.

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PURPOSE :

The purpose of this booklet is to assist Contractors in complying with Federal and State environmental laws and regulations. This booklet is designed to answer many of the environmental questions that arise as well as provide pertinent information on environmental topics.

EMERGENCY RESPONSE/SPILL RESPONSE :

Figure 1: Spill Notification and Reporting Chart

Figure 1 illustrates the proper notification and reporting information for spills occurring on MCAS, Beaufort. In the event of a spill, the form in Appendix A must be completed and returned to NREAO. A copy of Figure 1 is included in Appendix B for reproduction and posting at the job site.

HAZARDOUS MATERIALS/HAZARDOUS WASTE :

All persons on a Marine Corps installation are subject to compliance with federal and state regulations, as well as any permit conditions concerning the proper handling and disposal of hazardous waste (HW). The Resource Conservation and Recovery Act (RCRA), governs all HW from the point of generation to the point of final disposal. This includes HW generated by contractors aboard MCAS Beaufort.

MCAS Beaufort maintains a Hazardous Waste Management Plan which outlines the specific requirements for managing hazardous waste on the Air Station. Copies of the plan can be obtained from the ROICC. It is the responsibility of the Contractor to review this plan and certify that they understand the MCAS Hazardous Waste Management Plan (HWMP), applicable regulations, and policies relevant to Hazardous Waste Management. Appendix C contains the form that must be returned to the Natural Resources Environmental Affairs Office prior to starting work. In addition, Material Safety Data Sheets (MSDS) are to be included as part of the Hazardous Waste Management Plan that Contractors are required to submit to the ROICC or the Contract Administrator prior to beginning work. NREAO will use the MSDS's to assist Contractors in establishing Satellite Accumulation Areas and Hazardous Material Storage Areas.

It is the contractor's responsibility to ensure that any HW generated during work aboard MCAS Beaufort is properly accumulated, labeled, and stored. NREAO will provide oversight to verify compliance with applicable federal and state laws governing the generation of HW.

NREAO must be notified before any HW is generated on ROICC or FSC managed projects. This is necessary because of limitations contained within MCAS Beaufort's RCRA permit. The permit allows MCAS Beaufort to store only certain types of HW for more than 90 days. If the HW being generated is not specifically listed in the permit, then it must be properly disposed of within 90 days of first being accumulated. Hazardous waste personnel must approve all waste storage locations.

All HW must be properly containerized, stored, and labeled at the time the waste is first generated. Procedures for HW accumulation can be found in Sections 5 and 6 of the MCAS Hazardous Waste Management Plan.

Application Water/Wastewater Facilities (DHEC Form 1970), Asbestos Demolition and Removal, etc.

Please note as of June 2003, application fees are now applicable for both water permits and wastewater permits.

The South Carolina Department of Health and Environmental Control website is a useful reference for determining the required permits and obtaining the necessary forms. The website is located at: <http://www.scdhec.net>.

The South Carolina Department of Health and Environmental Control also published the Environmental Permitting Handbook. A copy of the Handbook is available on the Department of Health and Environmental Control website.

APPENDIX A SPILL REPORT FORM MARINE CORPS AIR STATION BEAUFORT

SPILL REPORT FORM

MARINE CORPS AIR STATION BEAUFORT

MEMORANDUM

From:
To: Environmental Affairs Officer
Via:
Subj: HM/HW/POL SPILL REPORT

Ref: (a)

1. In compliance with reference (a), the following report of a hazardous substance/petroleum, oil, lubricants (POL) spill/release is made:

- a. Date of incident: _____ Time of Incident: _____
- b. Person Reporting; Name: _____ Rank: _____
- c. Location; Unit/Activity: _____ Bldg: _____
- d. Substance: _____ Amount(Gallons): _____
- e. Description/details of events _____

f. On-scene Supervisor: _____

g. NOTIFICATION:

	Work Hrs.	After Hrs.	TIME CALLED
(1) NREAO <u>MANDATORY</u>	(7370)	(524-0783)	_____
(2) PMO Emergency Dispatcher (AS REQUIRED)	(911)		_____

h. ADDITIONAL COMMENTS (Cause of spill/release and corrective actions taken):

SUPERVISOR'S SIGNATURE _____

**OHS INCIDENT EVALUATION LOG SHEET
MARINE CORPS AIR STATION BEAUFORT**

Location: _____ Indoor: _____ Outdoor: _____

Time: _____ Date: _____ Confined Space: _____

On-Scene Status:

Injuries/Observed Effects: _____

Population Affected/Threatened: _____

Incident Conditions: Leak ___ Spill ___ Fire ___ Vapors ___ Dust ___

Other _____

Weather Conditions: Wind Direction _____ Wind Speed _____

Temperature _____ (°F, °C) Rain _____

Other _____

Material(s) Involved (Spell it out):

Chemical Name(s) _____

Trade Name(s) _____

I.D. #(s) _____ DOT Classification _____

Characteristics: Solid ___ Liquid ___ Gas ___ Mixture ___

Other _____

Quantity Spilled _____ (gal) (lbs) (other ___) Container _____

Hazard Characteristics: Health _____ Flash Point _____ (°F)

Boiling Point _____ (°F) Flammability _____ Ignition Temp _____ (°F)

Flammability Limits _____ Reactivity _____

Upper _____ Lower _____

Specific Gravity _____

APPENDIX B

**SPILL NOTIFICATION AND REPORTING FLOW
CHART**

SPILL NOTIFICATION AND REPORTING FLOWCHART

APPENDIX C

**CONTRACTOR CERTIFICATION OF
COMPLIANCE
MARINE CORPS AIR STATION BEAUFORT**

CERTIFICATION OF COMPLIANCE
MCAS BEAUFORT CONTRACTOR

I certify under penalty of law that I have received, read, and understand the MCAS Hazardous Waste Management Plan (HWMP), applicable regulations and policies relevant to Hazardous Waste Management. I further certify that all personnel who work either directly or indirectly for me onboard MCAS Beaufort have received training on applicable portions of the HWMP.

The above information is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Print Name

Signature

Title

Date

Phone Number

Mailing Address

City, State, Zip Code

APPENDIX D

MARINE CORPS AIR STATION BEAUFORT RECYCLE FLYER

recycle office to discuss and arrange service. Ask for Ted Hallman or James Williams.

D-1

"Be part of the pollution solution. Recycle - because it's right."

CONTRACTOR HAZARDOUS MATERIAL INVENTORY LOG
(EPRCA)
Continuation Sheet

PRIME COMPANY NAME: _____ CONTRACT NO: _____

PROJECT TITLE / LOCATION: _____

Material Name	Manufacturer	MSDS Number	State (i.e. Liquid, Solid, Gas)	Storage Quantity		Quality (lbs/gals) used in Calendar Year []
				Average Daily	Max Daily	

SECTION 01670

RECYCLED / RECOVERED MATERIALS

12/01

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 basic designation only.

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

40 CFR 247

Comprehensive Procurement Guideline for
Products Containing Recovered Materials

1.2 OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items, which must contain a specified percent range of recovered or recycled materials. EPA designated products specified in this contract comply with the stated policy and with the EPA guidelines. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

1.3 EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Various sections of the specifications contain requirements for materials that have been designated by EPA as being products, which are or can be made with recovered or recycled materials. These items, when incorporated into the work under this contract, shall contain at least the specified percentage of recycled or recovered materials unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4 EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.

1.5 EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

-- End of Section --

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01781

OPERATION AND MAINTENANCE DATA
12/01

PART 1 GENERAL

1.1 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system. 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 01332 "Construction Submittal Procedures."

1.1.1 Package Quality

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.1.2 Package Content

Data package content shall be as shown in the paragraph titled "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.

1.1.3 Changes to Submittals

Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.

1.2 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

1.2.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation:

1.2.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all operating conditions.

1.2.1.2 Operator Prestart

Include procedures required to set up and prepare each system for use.

1.2.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.2.1.4 Normal Operations

Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.

1.2.1.5 Emergency Operations

Include 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. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.2.1.6 Operator Service Requirements

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.

1.2.1.7 Environmental Conditions

Include 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.

1.2.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair.

1.2.2.1 Lubrication Data

Include preventative maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "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.

1.2.2.2 Preventive Maintenance Plan and Schedule

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

1.2.3 Corrective Maintenance (Repair)

Include manufacturer's recommended procedures and instructions for correcting problems and making repairs.

1.2.3.1 Troubleshooting Guides and Diagnostic Techniques

Include 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.

1.2.3.2 Wiring Diagrams and Control Diagrams

Wiring diagrams and control diagrams shall be 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.

1.2.3.3 Maintenance and Repair Procedures

Include instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.2.3.4 Removal and Replacement Instructions

Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

1.2.3.5 Spare Parts and Supply Lists

Include lists of spare parts and supplies required for maintenance and 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.

1.2.4 Corrective Maintenance Work-Hours

Include manufacturer's projection of corrective maintenance work-hours including requirements by type of craft. Corrective maintenance that requires completion or participation of the equipment manufacturer shall be identified and tabulated separately.

1.2.5 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:

1.2.6 Parts Identification

Provide identification and coverage for all 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 shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped 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

1.2.6.1 Warranty Information

List and explain the various warranties and include 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 such as the compressor of air conditioning system.

1.2.6.2 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.

1.2.6.3 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.

1.2.6.4 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 most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.3 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Furnish the O&M data packages specified in individual technical sections. The required information for each O&M data package is as follows:

1.3.1 Data Package 1

- a. Safety precautions
- b. Maintenance and repair procedures
- c. Warranty information
- d. Contractor information
- e. Spare parts and supply list

1.3.2 Data Package 2

- a. Safety precautions
- b. Normal operations
- c. Environmental conditions
- d. Lubrication data
- e. Preventive maintenance plan and schedule
- f. Maintenance and repair procedures
- g. Removal and replacement instructions
- h. Spare parts and supply list
- i. Parts identification
- j. Warranty information
- k. Contractor information

1.3.3 Data Package 3

- a. Safety precautions

- b. Normal operations
- c. Emergency operations
- d. Environmental conditions
- e. Lubrication data
- f. Preventive maintenance plan and schedule
- g. Troubleshooting guides and diagnostic techniques
- h. Wiring diagrams and control diagrams
- i. Maintenance and repair procedures
- j. Removal and replacement instructions
- k. Spare parts and supply list
- l. Parts identification
- m. Warranty information
- n. Testing equipment and special tool information
- o. Contractor information

1.3.4 Data Package 4

- a. Safety precautions
- b. Operator prestart
- c. Startup, shutdown, and post-shutdown procedures
- d. Normal operations
- e. Emergency operations
- f. Operator service requirements
- g. Environmental conditions
- h. Lubrication data
- i. Preventive maintenance plan and schedule
- j. Troubleshooting guides and diagnostic techniques

- k. Wiring diagrams and control diagrams
- l. Maintenance and repair procedures
- m. Removal and replacement instructions
- n. Spare parts and supply list
- o. Corrective maintenance man-hours
- p. Parts identification
- q. Warranty information
- r. Personnel training requirements
- s. Testing equipment and special tool information
- t. Contractor information

1.3.5 Data Package 5

- a. Safety precautions
- b. Operator prestart
- c. Start-up, shutdown, and post-shutdown procedures
- d. Normal operations
- e. Environmental conditions
- f. Preventive maintenance plan and schedule
- g. Troubleshooting guides and diagnostic techniques
- h. Wiring and control diagrams
- i. Maintenance and repair procedures
- j. Spare parts and supply list
- k. Testing equipments and special tools
- l. Warranty information
- m. Contractor information

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 02220

DEMOLITION
09/03

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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.6 (1990; R 1998) Safety Requirements for Demolition Operations

THE NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61-SUBPART M National Emission Standard for Asbestos

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (1996) Safety and Health Requirements Manual

1.2 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the Contracting Officer. Remove rubbish and debris from the project site; do not allow accumulations inside or outside the building(s) or on airfield pavements. The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. 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 01330 SUBMITTAL PROCEDURES:

SD-07 Certificates

Demolition plan; QC,

Notification of Demolition and Renovation forms; QC,

Submit proposed salvage, demolition and removal procedures to the Contracting Officer for approval before work is started.

SD-11 Closeout Submittals

Receipts; QC

1.4 REGULATORY AND SAFETY REQUIREMENTS

Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," safety requirements shall conform with ANSI A10.6.

1.4.1 Notifications

1.4.1.1 General Requirements

Furnish timely notification of demolition and renovation projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61-SUBPART M. Notify the local air pollution control district/agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61-SUBPART M.

1.4.2 Receipts

Submit a shipping receipt or bill of lading for all containers of ozone depleting substance (ODS) shipped to the Defense Depot, Richmond, Virginia.

1.5 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris to occupied portions of the building and on airfield pavements and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous

or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Vacuum and dust the work area daily. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to aircraft.

1.6 PROTECTION

1.6.1 Existing Work

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government; any damaged items shall be repaired or replaced as approved by the Contracting Officer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal work. Repairs, reinforcement, or structural replacement must have Contracting Officer approval.

1.6.2 Trees

Conform to Section 01575N, "Temporary Environmental Controls," for protection of natural resources to remain.

1.6.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.

1.7 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.8 FOREIGN OBJECT DAMAGE (FOD)

Aircraft and aircraft engines are subject to FOD from debris and waste material lying on airfield pavements. Remove all such materials that may appear on operational aircraft pavements due to the Contractor's operations. If necessary, the Contracting Officer may require the Contractor to install a temporary barricade at the Contractor's expense to control the spread of FOD potential debris. The barricade shall consist of a fence covered with a fabric designed to stop the spread of debris; anchor the fence and fabric to prevent displacement by winds or jet/prop blasts. Remove barricade when no longer required.

1.9 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair items to be relocated which are damaged or replace damaged items with new undamaged items as approved by the Contracting Officer.

1.10 REQUIRED DATA

Demolition plan shall include procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

3.1.1 Structures

Remove indicated existing structures as noted on the site demolition plan.

3.1.2 Utilities and Related Equipment

Remove existing utilities as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area. Remove meters and related equipment and deliver to a location on the station in accordance with instructions of the Contracting Officer. If utility lines are encountered that are not shown on drawings, contact the Contracting Officer for further instructions.

3.1.3 Paving and Slabs

Remove concrete and asphaltic concrete paving and slabs including aggregate base as indicated to a depth as indicated. Provide neat sawcuts at limits of pavement removal as indicated.

3.2 DISPOSITION OF MATERIAL

3.2.1 Title to Materials

Except where specified in other sections, all materials and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition and removal procedures, and authorization by the Contracting Officer to begin demolition. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

3.2.2 Reuse of Materials and Equipment

Remove and store materials and equipment indicated to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.2.3 Salvaged Materials and Equipment

Remove materials and equipment that are indicated and specified to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site, as directed by the Contracting Officer.

3.3 CLEANUP

3.3.1 Debris and Rubbish

Debris and rubbish shall be removed from basement and similar excavations. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

-- End of Section --

SECTION 02231

CLEARING AND GRUBBING

09/03

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. 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 01330 SUBMITTAL PROCEDURES:

SD-04 Samples

Herbicide

Submit samples in cans with manufacturer's label.

1.2 DELIVERY, STORAGE, AND HANDLING

Deliver materials to, store at the site, and handle in a manner which will maintain the materials in their original manufactured or fabricated condition until ready for use.

PART 2 PRODUCTS

2.1 HERBICIDE

Comply with Federal Insecticide, Fungicide, and Rodenticide Act (Title 7 U.S.C. Section 136) for requirements on contractor's licensing, certification and record keeping. Contact the command Pest Control Coordinator prior to starting work.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Roads and Walks

Keep roads and walks free of dirt and debris at all times.

3.1.2 Trees, Shrubs, and Existing Facilities

Protection shall be in accordance with Section 01575N, TEMPORARY ENVIRONMENTAL CONTROLS. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

3.1.3 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 shall be responsible for the repairs 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, the Contractor shall notify the Contracting Officer in ample time to minimize interruption of the service. Refer to Section 01310N, ADMINISTRATIVE REQUIREMENTS and Section 01575N, TEMPORARY ENVIRONMENTAL CONTROLS for additional utility protection.

3.2 CLEARING

Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared. Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be left standing. Apply herbicide in accordance with the manufacturer's label to the top surface of stumps designated not to be removed.

3.3 TREE REMOVAL

Where indicated or directed, trees and stumps that are designated as trees shall be removed from areas outside those areas designated for clearing and grubbing. This work shall include the felling of such trees and the removal of their stumps and roots as specified in paragraph GRUBBING. Trees shall be disposed of as specified in paragraph DISPOSAL OF MATERIALS.

3.4 GRUBBING

Grubbing shall consist of the removal and disposal of stumps, roots larger than 75 mm (3 inches) in diameter, and matted roots from the designated grubbing areas. Material to be grubbed, together with logs and other organic or metallic debris not suitable for foundation purposes, shall be removed to a depth of not less than 455 mm (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. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the original adjacent surface of the ground.

-- End of Section --

SECTION 02300

EARTHWORK
08/03

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 C 33 (2002a) Concrete Aggregates
- ASTM D 1140 (2000) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
- ASTM D 1557 (2000) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))
- ASTM D 2434 (1968; R 2000) Permeability of Granular Soils (Constant Head)
- ASTM D 2487 (2000) Soils for Engineering Purposes (Unified Soil Classification System)
- ASTM D 4318 (2000) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

U.S. ARMY CORPS OF ENGINEERS (USACE)

- EM 385-1-1 (1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

STATE OF SOUTH CAROLINA, DEPARTMENT OF TRANSPORTATION (SCDOT)
STANDARD

SCDOT

Standard Specifications for Highway
Construction; 2000 Edition

1.2.7 Initial Backfill Material

Initial backfill shall consist of select granular material or satisfactory materials free from rocks in any dimension or free from rocks of such size as recommended by the pipe manufacturer. When the pipe is coated or wrapped for corrosion protection, the initial backfill material shall be free of stones in any dimension or as recommended by the pipe manufacturer, whichever is smaller.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. 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 01330 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Testing
Borrow Site Testing

Within 24 hours of conclusion of physical tests, copies of test results, including calibration curves and results of calibration tests. Results of testing at the borrow site.

SD-07 Certificates

Testing

Qualifications of the commercial testing laboratory or Contractor's testing facilities.

1.4 SUBSURFACE DATA

Subsurface soil boring logs are shown on the drawings. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.5 CLASSIFICATION OF EXCAVATION

No consideration will be given to the nature of the materials, and all excavation will be designated as unclassified excavation. Excavation specified shall be done on a classified basis, in accordance with the following designations and classifications.

1.5.1 Common Excavation

Common excavation shall include the satisfactory removal and disposal of all materials not classified as rock excavation.

1.5.2 Rock Excavation

Rock excavation shall include blasting, excavating, grading, and disposing of material classified as rock and shall include the satisfactory removal and disposal of boulders 1/2 cubic meter (yard) or more in volume; solid rock; rock material that is in ledges, bedded deposits, and unstratified masses, which cannot be removed without systematic drilling and blasting; firmly cemented conglomerate deposits possessing the characteristics of solid rock impossible to remove without systematic drilling and blasting; and hard materials (see Definitions). The removal of any concrete or masonry structures, except pavements, exceeding 1/2 cubic meter (yard) in volume that may be encountered in the work shall be included in this classification. If at any time during excavation, including excavation from borrow areas, the Contractor encounters material that may be classified as rock excavation, such material shall be uncovered and the Contracting Officer notified by the Contractor. The Contractor shall not proceed with the excavation of this material until the Contracting Officer has classified the materials as common excavation or rock excavation and has taken cross sections as required. Failure on the part of the Contractor to uncover such material, notify the Contracting Officer, and allow ample time for classification and cross sectioning of the undisturbed surface of such material will cause the forfeiture of the Contractor's right of claim to any classification or volume of material to be paid for other than that allowed by the Contracting Officer for the areas of work in which such deposits occur.

1.6 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.
- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.

Bedding shall be of the type and thickness shown. Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe. 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 materials as follows:

- a. Class I: Angular, 6 to 40 mm (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 40 mm (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](#).
- c. Clean, coarse-grained sand classified by [ASTM D 2487](#) for bedding and backfill as indicated.
- d. Clean, coarsely graded natural gravel, crushed stone or a combination thereof identified in accordance with [ASTM D 2487](#) for bedding and backfill as indicated. Maximum particle size shall not exceed 3 inches.

3.10.1.4 Final Backfill

The remainder of the trench, except for special materials for roadways, railroads and airfields, shall be filled with satisfactory material. Backfill material shall be placed and compacted as follows:

- a. Roadways, Railroads, and Airfields: Backfill shall be placed up to the required elevation as specified. Water flooding or jetting methods of compaction will not be permitted.
- b. Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas: Backfill shall be deposited in layers of a maximum of 300 mm (12 inch) loose thickness, and compacted to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless

soils. Water jetting shall not be allowed to penetrate the initial backfill. Compaction by water flooding or jetting will not be permitted. This requirement shall also apply to all other areas not specifically designated above.

3.11 FINISHING

The surface of excavations, embankments, and subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for graded areas shall be within 30 mm (0.1 foot) of the grades and elevations indicated except that the degree of finish for subgrades shall be specified in paragraph SUBGRADE PREPARATION. Gutters and ditches shall be finished in a manner that will result in effective drainage. The surface of areas to be turfed shall be finished to a smoothness suitable for the application of turfing materials. Settlement or washing that occurs in graded, topsoiled, or backfilled areas prior to acceptance of the work, shall be repaired and grades re-established to the required elevations and slopes.

3.11.1 Subgrade and Embankments

During construction, embankments and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained to drain effectively at all times. The finished subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the Contractor in a satisfactory condition until ballast, subbase, base, or pavement is placed. The storage or stockpiling of materials on the finished subgrade will not be permitted. No subbase, base course, ballast, or pavement shall be laid until the subgrade has been checked and approved, and in no case shall subbase, base, surfacing, pavement, or ballast be placed on a muddy, spongy, or frozen subgrade.

3.11.2 Grading Around Structures

Areas within 1.5 m (5 feet) outside of each building and structure line shall be constructed true-to-grade, shaped to drain, and shall be maintained free of trash and debris until final inspection has been completed and the work has been accepted.

3.12 PLACING TOPSOIL

On areas to receive topsoil, the compacted subgrade soil shall be scarified to a 2 inch depth for bonding of topsoil with subsoil. Topsoil then shall be spread evenly to a thickness of 6 inches and graded to the elevations and slopes shown. Topsoil shall not be spread when frozen or excessively wet or dry. Material required for topsoil in excess of that produced by excavation within the grading limits shall be obtained from areas indicated.

3.13 DISPOSITION OF SURPLUS MATERIAL

Surplus material or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber shall be wasted in Government disposal area or removed from Government property as directed by the Contracting Officer.

-- End of Section --

Density; QC/AE

Thickness; QC/AE

Straightedge test; QC/AE

Submit reports for testing specified under paragraph entitled "Field Quality Control."

SD-07 Certificates

Asphalt mix delivery record; QC/AE

Asphalt concrete and material sources; QC/AE

Obtain approval of the Contracting Officer for materials and material sources 2 days prior to the use of such material in the work.

Asphalt concrete; QC/AE

Submit certificates, signed by the producer, that paving materials and incidental construction items conform to specification requirements.

1.3 QUALITY ASSURANCE

1.3.1 Regulatory Requirements

Provide work and materials in accordance with applicable requirements of SCDOT Standards.

1.3.2 Modification of References

Where term "Engineer" is used in SCDOT it shall be construed to mean Contracting Officer. Where term "state" is used, it shall mean "Federal Government".

1.3.3 Mix Delivery Record Data

Record and submit the following information to each load of mix delivered to the job site. Submit within one day after delivery on Government-furnished forms:

- a. Truck No:
- b. Time In:
- c. Time Out:
- d. Tonnage and Discharge Temperature:
- e. Mix Type:
- f. Location:
- g. Stations Placed:

1.3.4 Trial Batch

Submit current bituminous design reports for all mix types proposed for use on the project.

1.3.5 Mix Design

Submit results of laboratory tests performed on each mix design. Testing shall have been accomplished not more than one year prior to date of material placement.

PART 2 PRODUCTS

2.1 ASPHALT CONCRETE

Provide asphalt concrete in accordance with the applicable requirements of the SCDOT, except where specified otherwise.

2.2 BASE COURSE

SCDOT, materials for construction of the base course shall be in accordance with Section 310.

2.3 SURFACE COURSE

SCDOT, materials for construction of the surface course shall be in accordance with Section 401 for Type 1C Hot Mix Asphalt Surface Courses.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Excavation and Filling

Excavation and filling to establish elevation of subgrade is specified in Section 02301N, "Earthwork for Structures and Pavements."

3.2 CONSTRUCTION

Provide construction in accordance with the applicable requirements of the SCDOT, except where indicated or specified otherwise.

3.2.1 Subgrade

SCDOT, preparation of subgrade shall be in accordance with Section 02301N, "Earthwork for Structures and Pavements."

3.2.2 Base Course

SCDOT, methods of construction of the base course shall be in accordance with Section 310.

3.2.3 Surface Course

- c. **Straightedge Test:** Test compacted surface of binder course and wearing course with a straightedge as work progresses. Apply straightedge parallel with and at right angles to center line after final rolling. Variations in the binder course surface shall not be more than 1/4 inch from the lower edge of the 10 foot straightedge; variations in wearing course surface shall not be more than 1/4 inch from the lower edge of the 10 foot straightedge. Pavement showing irregularities greater than that specified shall be corrected as directed by Contracting Officer.

-- End of Section --

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 82	(1997; Rev. A) Steel Wire, Plain, for Concrete Reinforcement
ASTM A 123/A 123M	(2001) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 185	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 496	(1997; Rev. A) Steel Wire, Deformed, for Concrete Reinforcement
ASTM A 497	(1999) Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
ASTM A 615/A 615M	(2001) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 616/A 616M	(1996; Rev. A) Rail-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 617/A 617M	(1996; Rev. A) Axle-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 706/A 706M	(2001) Low-Alloy Steel Deformed Bars for Concrete Reinforcement
ASTM A 767/A 767M	(2000; Rev. B) Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
ASTM A 775/A 775M	(2001) Epoxy-Coated Reinforcing Steel Bars
ASTM A 780	(2001) Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A 934/A 934M	(2001) Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM C 31/C 31M	(2000) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(2001) Concrete Aggregates
ASTM C 39	(2001) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42/C 42M	(1999) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 94/C 94M	(2000) Ready-Mixed Concrete
ASTM C 143/C 143M	(2000) Slump of Hydraulic Cement Concrete
ASTM C 150	(2000) Portland Cement

ASTM C 171	(1997; Rev. A) Sheet Materials for Curing Concrete
ASTM C 172	(1999) Sampling Freshly Mixed Concrete
ASTM C 173/C 173M	(2001) Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 192/C 192M	(2000) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 227	(1997; Rev. A) Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C 231	(1997) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(2000) Air-Entraining Admixtures for Concrete
ASTM C 295	(1998) Petrographic Examination of Aggregates for Concrete
ASTM C 309	(1998; Rev. A) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 330	(2000) Lightweight Aggregates for Structural Concrete
ASTM C 494/C 494M	(1999) Chemical Admixtures for Concrete
ASTM C 567	(2000) Unit Weight of Structural Concrete
ASTM C 595	(2000) Blended Hydraulic Cements
ASTM C 618	(2000) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 881	(1999) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 920	(2001) Elastomeric Joint Sealants
ASTM C 989	(1999) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM C 1017/C 1017M	(1998) Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C 1107	(1999) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C 1116	(2000) Fiber-Reinforced Concrete and Shotcrete

ASTM C 1240 (2000) Use of Silica Fume as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout

ASTM D 1190 (1997) Concrete Joint Sealer, Hot-Applied Elastic Type

ASTM D 1751 (1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

ASTM D 1752 (1984; R 1996) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

ASTM D 1854 (1996) Jet-Fuel-Resistant Concrete Joint Sealer, Hot-Applied Elastic Type

ASTM D 4397 (2000) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications

ASTM E 1155/E 1155M (1996) Determining Floor Flatness and Floor Levelness Numbers

AMERICAN WELDING SOCIETY, INC. (AWS)

AWS D1.4 (1998) Structural Welding Code - Reinforcing Steel

CORPS OF ENGINEERS (COE)

COE CRD-C 572 (1974) Polyvinylchloride Waterstop

U.S. DEPARTMENT OF COMMERCE PRODUCT STANDARDS (PS)

PS-1 (1995) Construction and Industrial Plywood

FEDERAL SPECIFICATIONS (FS)

FS SS-S-200 (Rev. E; Am. 2) Sealants, Joint, Two-Component, Jet-Blast Resistant, Cold-Applied, For Portland Cement Concrete Pavement

FS UU-B-790 (Rev. A Reinst) Building Paper, Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire Resistant)

FS SS-S-1614 (Rev. A) Sealants, Joint, Jet-Fuel-Resistant, Hot-Applied, for Portland Cement and Tar Concrete Pavements

1.2 DEFINITIONS

- a. "Cementitious material" as used herein shall include all portland cement, pozzolan, fly ash, ground iron blast-furnace slag, and silica fume.
- 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.

1.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Formwork

Reinforcing steel; G

Reproductions of contract drawings are unacceptable.

SD-03 Product Data

Materials for curing concrete

Joint sealants

Joint filler

SD-05 Design Data

Concrete mix design; G

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, fly ash, pozzolans, ground slag, and admixtures; and applicable reference specifications. Provide mix proportion data using at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required. If source material changes, resubmit mix proportion data using revised source material. No material shall be provided unless proven by trial mix studies to meet the requirements of this specification, unless otherwise approved in writing by the Contracting Officer. The submittal shall clearly indicate where each mix design will be used when more than one mix design is submitted. Submit additional data regarding concrete aggregates if the source of aggregate changes.

SD-06 Test Reports

Concrete mix design; G

Aggregates

Compressive strength tests

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, as though the word "shall" had been substituted for the words "should" or "could" or "may," wherever they appear. Interpret reference to the "Building Official," the "Structural Engineer," and the "Architect/Engineer" to mean the Contracting Officer.

1.5 DELIVERY, STORAGE, AND HANDLING

Do not deliver concrete until forms, reinforcement, embedded items, and chamfer strips are in place and ready for concrete placement. ACI 301/301M for job site storage of materials. Protect materials from contaminants such as grease, oil, and dirt. Ensure materials can be accurately identified after bundles are broken and tags removed.

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.

PART 2 PRODUCTS

2.1 MATERIALS FOR FORMS

Provide wood, plywood, or steel. Use plywood or steel forms where a smooth form finish is required. Lumber shall be square edged or tongue-and-groove boards, free of raised grain, knotholes, or other surface defects. Plywood: PS-1, B-B concrete form panels or better or AHA A135.4, hardboard for smooth form lining. Steel form surfaces shall not contain irregularities, dents, or sags.

2.2 FORM TIES AND ACCESSORIES

The use of wire alone is prohibited. Form ties and accessories shall not reduce the effective cover of the reinforcement.

2.3 CONCRETE

2.3.1 Contractor's Option for Material Only

At the option of the Contractor, those applicable material sections of South Carolina DOT RBS for Class A strength concrete shall govern in lieu of this specification for concrete. Do not change the selected option during the course of the work.

2.3.2 Contractor-Furnished Mix Design

ACI 211.1, ACI 301/301M, and ACI 318/318M except as otherwise specified. The compressive strength (f'_c) of the concrete for each portion of the structure(s) shall be as indicated and as specified below.

Location	f'c (Min. 28- Day Comp. Strength) (MPa)	ASTM C 33 Maximum Nominal Aggregate (Size No.)	Range of Slump (mm)	[Maximum Water- Cement Ratio] (by weight)	[Air Entr.] (percent)
[All areas]	[_____]	[_____]	[_____]	[_____]	[_____]
[Concrete exposed to weather]	[30]	[57]	[_____]	[0.50]	[6]
All other areas	[_____]	[_____]	[_____]	[_____]	[_____]
[Reinforced foundation walls and footings]	[_____]	[_____]	[25-75]	[_____]	[_____]
Plain footings, caissons, and substructure walls	[_____]	[_____]	[25-75]	[_____]	[_____]
Beams and reinforced walls	[_____]	[_____]	[25-100]	[_____]	[_____]
Building columns	[_____]	[_____]	[25-100]	[_____]	[_____]
Pavement and exterior slabs	[_____]	[_____]	[25-75]	[_____]	[_____]
Floor slabs	[_____]	[_____]	[_____]	[_____]	[_____]
Floor slabs	[_____]	[See Combined Aggregate Gradation]	[_____]	[_____]	[_(a)_]
Floor toppings	[_____]	[_____]	[_____]	[_____]	[_____]
Walks, curbs, and gutters	[_____]	[_____]	[_____]	[_____]	[_____]
Utility structures	[_____]	[_____]	[_____]	[_____]	[_____]
Drainage structures	[_____]	[_____]	[_____]	[_____]	[_____]

the following materials: ASTM C 618 pozzolan or fly ash, ASTM C 989 ground iron blast-furnace slag. The pozzolan or fly ash content shall not exceed 25 percent by weight of the total cementitious material. The ground iron blast-furnace slag shall not exceed 50 percent by weight of total cementitious material. For exposed concrete, use one manufacturer for each type of cement, ground slag, fly ash, and pozzolan.

2.4.1.1 Fly Ash and Pozzolan

ASTM C 618, Type N, F, or C, except that the maximum allowable loss on ignition shall be 6 percent for Types N and F. Add with cement.

2.4.1.2 Ground Iron Blast-Furnace Slag

ASTM C 989, Grade 120.

2.4.2 Water

Water shall be fresh, clean, and potable; free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances deleterious to concrete.

2.4.3 Aggregates

ASTM C 33, except as modified herein. Furnish aggregates for exposed concrete surfaces from one source. Aggregates shall not contain any substance which may be deleteriously reactive with the alkalies in the cement.

2.4.4 Nonshrink Grout

ASTM C 1107.

2.4.5 Admixtures

ASTM C 494/C 494M: 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.

2.4.5.1 Air-Entraining

ASTM C 260.

2.4.7 Materials for Curing Concrete

2.4.7.1 Impervious Sheeting

ASTM C 171; waterproof paper, clear or white polyethylene sheeting, or polyethylene-coated burlap.

2.4.7.2 Pervious Sheeting

AASHTO M182.

2.4.7.3 Liquid Membrane-Forming Compound

3.1.3 Reshoring

Reshore concrete elements where forms are removed prior to the specified time period. Do not permit elements to deflect or accept loads during form stripping or reshoring. Forms on columns, walls, or other load-bearing members may be stripped after 2 days if loads are not applied to the members. After forms are removed, slabs and beams over 3000 mm 10 feet in span and cantilevers over 1200 mm 4 feet shall be reshored for the remainder of the specified time period in accordance with paragraph entitled "Removal of Forms." Perform reshoring operations to prevent subjecting concrete members to overloads, eccentric loading, or reverse bending. Reshoring elements shall have the same load-carrying capabilities as original shoring and shall be spaced similar to original shoring. Firmly secure and brace reshoring elements to provide solid bearing and support.

3.3 Formed Surfaces

3.3.1 Tolerances

ACI 347R and as indicated.

3.3.2 As-Cast Form

Provide form facing material producing a smooth, hard, uniform texture on the concrete. Arrange facing material in an orderly and symmetrical manner and keep seams to a practical minimum. Support forms as necessary to meet required tolerances. Material with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not be used.

3.4 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

ACI 301/301M. Provide bars, wire fabric, wire ties, supports, and other devices necessary to install and secure reinforcement. Reinforcement shall 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.

3.4.2 Reinforcement Supports

Place reinforcement and secure with galvanized or non corrodible chairs, spacers, or metal hangers. For supporting reinforcement on the ground, use concrete or other non corrodible material, having a compressive strength equal to or greater than the concrete being placed.

3.4.4 Splicing

As indicated. For splices not indicated ACI 301/301M. Do not splice at points of maximum stress. Overlap welded wire fabric the spacing of the cross wires, plus 50 mm 2 inches.

3.4.5 Future Bonding

Plug exposed, threaded, mechanical reinforcement bar connectors with a

3.6.6 Hot Weather

ACI 305R. Maintain required concrete temperature using Figure 2.1.5 in ACI 305R to prevent the evaporation rate from exceeding 1 kg per square meter 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.

3.7 SURFACE FINISHES EXCEPT FLOOR, SLAB, AND PAVEMENT FINISHES

3.7.1 Defects

Repair formed surfaces by removing minor honeycombs, pits greater than 600 square mm 1 square inch surface area or 6 mm 0.25 inch maximum depth, or otherwise defective areas. Provide edges perpendicular to the surface and patch with nonshrink grout. Patch tie holes and defects when the forms are removed. Concrete with extensive honeycomb including exposed steel reinforcement, cold joints, entrapped debris, separated aggregate, or other defects which affect the serviceability or structural strength will be rejected, unless correction of defects is approved. Obtain approval of corrective action prior to repair. The surface of the concrete shall not vary more than the allowable tolerances of ACI 347R. Exposed surfaces shall be uniform in appearance and finished to a smooth form finish unless otherwise specified.

3.7.3 Formed Surfaces

3.7.3.1 Tolerances

ACI 117 and as indicated.

3.7.3.2 As-Cast Rough Form

Provide for surfaces not exposed to public view. Patch this holes and defects and level abrupt irregularities. Remove or rub off fins and other projections exceeding 6 mm 0.25 inch in height.

3.8 FLOOR, SLAB, AND PAVEMENT FINISHES AND MISCELLANEOUS CONSTRUCTION

ACI 302.1R, unless otherwise specified. Slope slabs uniformly to drain.

3.8.1 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.

3.8.1.2 Floated

Use for exterior slabs where not otherwise specified. After the concrete has been placed, consolidated, struck off, and leveled, do not work the concrete further, until ready for floating. Whether floating with a wood, magnesium, or composite hand float, with a bladed power trowel equipped with float shoes, or with a powered disc, float shall begin when the surface has stiffened sufficiently to permit the operation. During or after the first floating, surface shall be checked with a 3 meter 10 foot straightedge applied at no less than two different angles, one of which is perpendicular to the direction of strike off. High spots shall be cut down and low spots filled during this procedure to produce a surface level within [6] [_____] mm in 3 mn1/4 inch in 10 feet.

3.8.1.6 Broomed

Use on surfaces of exterior walks, and platforms unless otherwise indicated. Perform a floated finish, then draw a broom or burlap belt across the surface to produce a coarse scored texture. Permit surface to harden sufficiently to retain the scoring or ridges. Broom transverse to traffic or at right angles to the slope of the slab.

3.9 CURING AND PROTECTION

ACI 301/301M 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 surfaces where appearance would be objectionable, on any surface to be painted, where coverings are to be bonded to the concrete, or 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.

3.9.1 Moist Curing

Remove water without erosion or damage to the structure.

3.9.1.1 Ponding or Immersion

Continually immerse the concrete throughout the curing period. Water shall not be more than 10 degrees C 20 degrees F less than the temperature of the concrete. For temperatures between 4 and 10 degrees C 40 and 50 degrees F, increase the curing period by 50 percent.

3.9.1.2 Fog Spraying or Sprinkling

Apply water uniformly and continuously throughout the curing period. For temperatures between 4 and 10 degrees C 40 and 50 degrees F, increase the curing period by 50 percent.

ASTM C 173/C 173M or ASTM C 231 for normal weight concrete and ASTM C 173/C 173M for lightweight concrete. Test air-entrained concrete for air content at the same frequency as specified for slump tests.

3.10.2.7 Compressive Strength Tests

ASTM C 39. Make five test cylinders for each set of tests in accordance with ASTM C 31/C 31M. Precautions shall be taken to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve. Samples for strength test of concrete placed each day shall be taken not less than once a day. 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 shall be the average of two cylinders from the same concrete sample tested at 28 days. If the average of any three consecutive strength test results is less than $f'c$ or if any strength test result falls below $f'c$ by more than 3 MPa (500 psi) 500 psi, take a minimum of three ASTM C 42/C 42M core samples from the in-place work represented by the low test cylinder results and test. Concrete represented by core test shall be considered structurally adequate if the average of three cores is equal to at least 85 percent of $f'c$ and if no single core is less than 75 percent of $f'c$. Locations represented by erratic core strengths shall be retested. Remove concrete not meeting strength criteria and provide new acceptable concrete. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete.

-- End of Section --

SECTION 04200

UNIT MASONRY

09/99

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 CONCRETE INSTITUTE (ACI)

ACI 530.1 (1995) Masonry Structures (ASCE 6-95)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36/A 36M (1996) Carbon Structural Steel

ASTM A 82 (1995; Rev. A) Steel Wire, Plain, for Concrete Reinforcement

ASTM A 153/A 153M (1995) Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A 167 (1996) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

ASTM A 366/A 366M (1991; R 1993) Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality

ASTM A 615/A 615M (1996; Rev. A) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

ASTM A 653/A 653M (1996) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process (Metric)

ASTM B 370 (1992) Copper Sheet and Strip for Building Construction

ASTM C 55 (1997) Concrete Brick

ASTM C 90 (1997) Loadbearing Concrete Masonry Units

ASTM C 216 (1997) Facing Brick (Solid Masonry Units Made from Clay or Shale)

ASTM C 270 (1997) Mortar for Unit Masonry

ASTM C 476 (1995) Grout for Masonry

Coordinate with other requirements for windows and doors. As work progresses, build in metal door and frames, window frames and other building components as applicable. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 300 mm [12] [_____] inches from framed openings. Bed anchors of metal window frames in adjacent mortar joints.

3.11 EMBEDDED ITEMS

Build in anchor bolts and plates as indicated.

3.12 WORKMANSHIP AND TOLERANCES

ACI 530.1. Cover walls not being worked on with waterproof membrane.

3.13 OPENINGS

Provide chases, pipe and conduit openings as indicated. Build in pipe sleeves as indicated.

3.14 PARGING (WHERE INDICATED)

Dampen masonry walls. Parge in two uniform coats to total thickness of 20 mm 3/4 inches. Provide steel trowel finish.

3.15 CLEANING

- a. Keep exposed surfaces clean during construction. Avoid smearing mortar on face of units.
- b. Clean masonry with potable water. Detergents may be used.
- c. Do not use acid, caustic solutions, or sandblasting.
- d. Masonry shall be free of stains, efflorescence, mortar or grout droppings, and debris.

-- End of Section --

3.6 INSTALLATION OF VAPOR RETARDER

Apply vapor retarder to provide a continuous barrier at window and door frames, and at all penetrations such as electrical outlets and switches, plumbing connections, and utility service penetrations. Lap and seal joints in the vapor retarder according to the manufacturer's recommendations.

-- End of Section --

3.2.7 Application of Gypsum Board to Steel Framing and Furring

Apply in accordance with ASTM C 840, System VIII or GA 216.

3.2.8 Arches and Bending Radii

Apply gypsum board in accordance with ASTM C 840, System IX or GA 216.

3.2.9 Gypsum Board for Wall Tile or Tile Base Applied with Adhesive

In dry areas (areas other than tubs, shower enclosures, saunas, steam rooms, gang shower rooms), apply water-resistant gypsum backing board in accordance with ASTM C 840, System X or GA 216.

3.2.10 Exterior Application

Apply gypsum soffit board in accordance with ASTM C 840, System XI or GA 216.

3.2.12 Control Joints

Install expansion and contraction joints in ceilings and walls in accordance with ASTM C 840, System XIII or GA 216, unless indicated otherwise.

3.3 APPLICATION OF CEMENTITIOUS BACKER UNITS

3.3.1 Application

In wet areas (tubs, shower enclosures, saunas, steam rooms, gang shower rooms), apply cementitious backer units in accord with ANSI A108.11.

3.3.2 Joint Treatment

ANSI A108.11.

3.4 FINISHING OF GYPSUM BOARD

Tape and finish gypsum board in accordance with ASTM C 840 or GA 216. Provide joint, fastener depression, and corner treatment. Do not use fiber glass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.

3.4.1 Skim Coat

Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, apply a thin skim coat of joint compound to the entire gypsum board surface, after the three-coat joint and fastener treatment is complete and dry. Apply skim coat with trowel, broadknife or long-nap roller. Wipe tightly with trowel or broadknife.

3.5 SEALING

Seal openings around pipes, fixtures, and other items projecting through gypsum board and cementitious backer units as specified in Section 07920, "Joint Sealants." Apply material with exposed surface flush with gypsum board or cementitious backer units.

3.6 FIRE-RESISTANT ASSEMBLIES

Wherever fire-rated gypsum board construction is indicated, provide materials and application methods, including types and spacing of fasteners, in accordance with the specifications contained in UL FRD for the Design Number(s) indicated, or GA 600 for the File Number(s) indicated.

3.7 PATCHING

Patch surface defects in gypsum board to a smooth, uniform appearance, ready to receive finish as specified.

-- End of Section --

FS TT-P-38 (Rev. E) Paint, Aluminum (Ready-Mixed)

FS TT-E-487 (Rev. E; Am. 1) Enamel: Floor and Deck

FS TT-C-542 (Rev. E) Coating, Polyurethane, Oil-Free, Moisture Curing

FS TT-C-555 (Rev. B; Am. 1) Coating, Textured (for Interior and Exterior Masonry Surfaces)

FS TT-P-664 (Rev. D) Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, VOC-Compliant

FS TT-S-708 (Rev. A; Am. 2) Stain, Oil: Semi-Transparent, Wood, Exterior

FS TT-S-711 (Rev. C) Stain; Oil Type, Wood, Interior

FS TT-E-2784 (Rev. A) Enamel (Acrylic Emulsion, Exterior)

MASTER PAINTERS INSTITUTE (MPI) Org

MPI 1 (Mar 2000) Aluminum Paint

MPI 2 (Mar 2000) Aluminum Heat Resistant Enamel (up to 427 C and 800 F)

MPI 4 (Mar 2000) Interior/Exterior Latex Block Filler

MPI 5 (Mar 2000) Exterior Alkyd Wood Primer

MPI 7 (Mar 2000) Exterior Oil Wood Primer

MPI 9 (Mar 2000) Exterior Alkyd Enamel

MPI 10 (Mar 2000) Exterior Latex, Flat

MPI 11 (Mar 2000) Exterior Latex, Semi-Gloss

MPI 13 (Mar 2000) Exterior Semi-Transparent Stain (solvent based)

MPI 14 (Mar 2000) Exterior Solid Color Stain (solvent based)

MPI 17 (Mar 2000) Plastic Primer (water based)

MPI 22 (Mar 2000) High Heat Resistant Coating

MPI 28 (Mar 2000) Exterior Marine Spar Varnish, Gloss

MPI 31 (Mar 2000) Polyurethane, Moisture Cured,

SSPC SP 3	(1995) Power Tool Cleaning
SSPC SP 5	(1994) White Metal Blast Cleaning
SSPC SP 6	(1994) Commercial Blast Cleaning
SSPC SP 7	(1994) Brush-Off Blast Cleaning
SSPC SP 10	(1994) Near-White Blast Cleaning
SSPC SP 12	(1995) Surface Preparation and Cleaning of Steel and Other Hard Materials by High-and Ultra high-Pressure Water Jetting Prior to Recoating
SSPC Paint 20	(1991) Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic")
SSPC Paint 22	(1991) Epoxy-Polyamide Paints (Primer, Intermediate, and Topcoat)
SSPC Paint 24	(1991) Latex Semi-Gloss Exterior Topcoat
SSPC Paint 104	(1991) White or Tinted Alkyd Paint

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Piping identification

Submit color stencil codes.

SD-03 Product Data

Coating; G OIC

Sealant

For each type of coating, sealant, or other product furnished, submit data from the manufacturer's paint laboratory indicating that the product conforms to requirements of the referenced specification.

SD-04 Samples

Color; G OIC

Submit manufacturer's samples of paint colors. Cross reference color samples to color scheme as indicated.

SD-08 Manufacturer's Instructions

Application instructions

Manufacturer's material safety data sheets

Submit Manufacturer's material safety data sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED-STD-313.

SD-07 Certificates

Applicator's qualifications

Evidence of acceptable variation; G OIC

1.3 APPLICATOR'S QUALIFICATIONS

Submit evidence that applicator has satisfactorily applied paint by airless spray at minimum of two sites. Indicate names and locations of sites, and type and design of equipment used, including safety devices.

1.4 EVIDENCE OF ACCEPTABLE VARIATION

If a product proposed for use does not conform to requirements of the referenced specification, submit for approval to the Contracting Officer, evidence from the paint manufacturer's laboratory that the proposed product is either equal to or better than the product specified. The submittal shall include the following:

- a. Identification of the proposed substitute;
- b. Reason why the substitution is necessary;
- c. A comparative analysis of the specified product and the proposed substitute, including tabulations of the composition of pigment and vehicle;
- d. The differences between the specified product and the proposed substitute; and
- e. Other information necessary for an accurate comparison of the proposed substitute and the specified product.

1.5 QUALITY ASSURANCE

1.5.1 Qualifications of Airless Spray Applicators

Satisfactory application of paint by airless spray at a minimum of two sites.

1.5.2 Field Samples and Tests

The Government will take 0.5 liter one pint samples of paint at random from the products delivered to the job site and test them to verify that the products either conform to the referenced specifications or the approved substitution. Products which do not conform shall be removed from the job site and replaced with new products that conform to the referenced specification or the approved substitution.

faceshield, and other recommended protective clothing and equipment to avoid exposure of skin, eyes, and respiratory system. Conduct work in a manner to minimize exposure of building occupants and the general public.

- b. The appropriate OSHA standard in 29 CFR 1910.1025 and 29 CFR 1926.62 for surface preparation on painted surfaces containing lead. Removal and disposal of coatings which contain lead is specified in Section 13283, "Removal and Disposal of Lead-Containing Paint." Additional guidance is given in SSPC Guide 6 and SSPC Guide 7.
- c. 29 CFR 1910.1000.
- d. ACGIH TLV-BKLT, threshold limit values.
- e. Manufacturer's material safety data sheets (MSDS).

1.9 ENVIRONMENTAL CONDITIONS

1.9.1 Exterior Coatings

Do not apply coating to surfaces during foggy or rainy weather, or under the following surface temperature conditions:

- a. Less than 3 degrees C 5 degrees F above dew point;
- b. Below 4 degrees C 40 degrees F (for oil-based paints), 10 degrees C 50 degrees F (for latex paints) or over 35 degrees C 95 degrees F, unless approved by the Contracting Officer.

1.9.2 Interior Coatings

Apply coatings when surfaces to be painted are dry and the following surface temperatures can be maintained:

- a. Between 4 and 35 degrees C 40 and 95 degrees F during application of enamels and varnishes;
- b. Between 10 and 35 degrees C 50 and 95 degrees F during application of other coatings.

1.10 COLOR SELECTION

Colors of finish coats shall be as indicated or specified. Where not indicated or specified, colors shall be selected by the Contracting Officer. Manufacturers' names and color identification are used for the purpose of color identification only. Named products are acceptable for use only if they conform to specified requirements. Products of other manufacturers are acceptable if the colors approximate colors indicated and the product conforms to specified requirements.

1.11 LOCATION AND SURFACE TYPE TO BE PAINTED

1.11.1 Painting Included

Where a space or surface is indicated to be painted, include the following

unless indicated otherwise.

- a. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.
- b. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.
- c. Existing coated surfaces that are damaged during performance of the work.

1.11.2 Painting Excluded

Do not paint the following unless indicated otherwise.

- a. Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.
- b. Surfaces in concealed spaces. Concealed spaces are defined as enclosed spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, and chases.
- c. Steel to be embedded in concrete.
- d. Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.

1.11.3 Exterior Painting

Includes new surfaces, existing coated surfaces, and existing uncoated surfaces, of the buildings and appurtenances as indicated. Also included are existing coated surfaces made bare by cleaning operations.

1.11.4 Interior Painting

Includes new surfaces, existing uncoated surfaces, and existing coated surfaces of the buildings and appurtenances as indicated and existing coated surfaces made bare by cleaning operations. Where a space or surface is indicated to be painted, include the following items, unless indicated otherwise.

- a. Exposed columns, girders, beams, joists, and metal deck; and
- b. Other contiguous surfaces.

1.11.5 Mechanical and Electrical Painting

Includes field coating of interior and exterior new and existing surfaces.

- a. Where a space or surface is indicated to be painted, include the following items unless indicated otherwise.
 - (1) Exposed piping, conduit, and ductwork;
 - (2) Supports, hangers, air grilles, and registers;

shall be same size, wood species, and finish as the existing.

- c. Sanding and Scraping: Traverse floors a minimum of three times with power sander. A rotary disc sander may be used for the final cut, but make other cuts with a drum-type machine. Make first cut across grain or at 45-degree angle. Make succeeding cuts in direction of grain. Use No. 2 sandpaper for first traverse, No. 1/2 for second traverse, and No. 0 for the third. Use electric edger or hand sander for small areas near walls, in corners, and in small closets. Hand scrape small areas as necessary. Follow scraping by hand sanding in same direction as final cut.
- d. Final Cleaning: After sanding, sweep and vacuum floors clean. Do not walk on floors thereafter until specified sealer has been applied and is dry.

3.8 APPLICATION

3.8.1 Coating Application

Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates, except as modified herein. Thoroughly work coating materials into joints, crevices, and open spaces. Touch up damaged coatings before applying subsequent coats. Interior areas shall be broom clean and dust free before and during the application of coating material. Apply paint to new fire extinguishing sprinkler systems including valves, piping, conduit, hangers, supports, miscellaneous metal work, and accessories. Shield sprinkler heads with protective coverings while painting is in progress. Remove sprinkler heads which have been painted and replace with new sprinkler heads. For piping in unfinished spaces, provide primed surfaces with one coat of red alkyd gloss enamel to a minimum dry film thickness of 0.025 mm 1.0 mil. Unfinished spaces include attic spaces, spaces above suspended ceilings, crawl spaces, pipe chases, mechanical equipment room, and space where walls or ceiling are not painted or not constructed of a prefinished material. For piping in finished areas, provide prime surfaces with two coats of paint to match adjacent surfaces, except provide valves and operating accessories with one coat of red alkyd gloss enamel. Upon completion of painting, remove protective covering from sprinkler heads.

- a. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying, but not to present topcoat adhesion problems. Provide each coat in specified condition to receive next coat.
- b. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover surface of preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.
- c. Finished Surfaces: Provide finished surfaces free from runs, drips, ridges, waves, laps, brush marks, and variations in colors.

- d. Thermosetting Paints: Topcoats over thermosetting paints (epoxies and urethanes) should be applied while the intermediate coat is still tacky, within a few days. Otherwise, apply a mist-coat of 0.02 to 0.05 wet mm 1 to 2 wet mils of MIL-DTL-24441/29 and allow to cure to tack, a minimum of 4 hours, before topcoating.
- e. Floors: For nonslip surfacing on level floors, as the intermediate coat is applied, cover wet surface completely with almandite garnet, Grit No. 36, with maximum passing U.S. Standard Sieve No. 40 less than 0.5 percent. When the coating is dry, use a soft bristle broom to sweep up excess grit, which may be reused, and vacuum up remaining residue before application of the topcoat. For nonslip surfacing on ramps, provide MIL-C-24667, applied by roller in accordance with manufacturer's instructions.

3.8.2 Equipment

Apply coatings with approved brushes, approved rollers, or approved spray equipment, unless specified otherwise. Spray areas made inaccessible to brushing by items such as ducts and other equipment.

3.8.3 Thinning of Paints

Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory for the type of paint being used. Obtain written permission from the Contracting Officer to use thinners. The written permission shall include quantities and types of thinners to use.

3.8.4 Coating Systems

- a. Systems by Substrates: Apply coatings that conform to the respective specifications indicated.
- b. Minimum Dry Film Thickness (DFT): Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 0.038 mm 1.5 mil each coat unless otherwise specified. Coating thickness where specified, refers to the minimum dry film thickness. The DFT range specified for MIL-C-24667 represents minimum peak and valley measurements.
- c. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.
- d. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:
 - (1) One coat of primer.
 - (2) One coat of undercoat or intermediate coat.
 - (3) One topcoat to match adjacent surfaces.
- e. Existing Coated Surfaces To Be Painted: Apply coatings conforming to the respective specifications indicated, except that

pretreatments, sealers and fillers need not be provided on surfaces where existing coatings are soundly adhered and in good condition. Do not omit undercoats or primers.

3.9 COATING SYSTEMS FOR METAL

- a. Primer: Apply specified ferrous metal primer on the same day that surface is cleaned. If flash rusting occurs, re-clean the surface prior to application of primer.

(1) Inaccessible Surfaces: Prior to erection, use two coats of specified primer on metal surfaces that will be inaccessible after erection.

(2) Shop-primed Surfaces: Touch up exposed substrates and damaged coatings to protect from rusting prior to applying field primer.

(3) Surface Previously Coated with Epoxy or Urethane: Apply MIL-DTL-24441/1, Formula 150, 0.038 mm 1.5 mils DFT immediately prior to application of epoxy or urethane coatings.

(4) Pipes and Tubing: Semitransparent film applied to pipes and tubing at the mill is not to be considered a shop coat. Remove shop coat and apply specified ferrous metal primer prior to application of subsequent coats.

(5) Exposed Nails, Screws, Fasteners, and Miscellaneous Ferrous Surfaces. On surfaces to be coated with water thinned coatings, spot prime exposed nails and other ferrous metal with latex primer, CID A-A-50557.

3.10 COATING SYSTEMS FOR CONCRETE AND CEMENTITIOUS SUBSTRATES

Apply coatings indicated.

3.11 COATING SYSTEMS FOR WOOD AND PLYWOOD

- a. Apply coatings indicated.
- b. Prior to erection, apply two coats of specified primer to treat and prime wood and plywood surfaces which will be inaccessible after erection.
- c. Apply stains in accordance with manufacturer's printed instructions.
- d. Wood Floors to Receive Natural Finish: Thin first coat 2 to 1 using thinner recommended by coating manufacturer. Apply all coatings at rate of 30 square meters per 4 liters 300 to 350 square feet per gallon. Apply second coat not less than 2 hours and not over 24 hours after first coat has been applied. Apply with lambs wool applicators or roller as recommended by coating manufacturer. Buff or lightly sand between intermediate coats as recommended by coating manufacturer's printed instructions.

3.12 PIPING IDENTIFICATION

Piping Identification, Including Surfaces In Concealed Spaces: Provide in accordance with MIL-STD-101. Place stenciling in clearly visible locations. On piping not covered by MIL-STD-101, stencil approved names or code letters, in letters a minimum of 13 mm 1/2 inch high for piping and a minimum of 50 mm 2 inches high elsewhere. Stencil arrow-shaped markings on piping to indicate direction of flow. Use black stencil paint, CID A-A-1558.

3.13 INSPECTION AND ACCEPTANCE

In addition to meeting previously specified requirements, demonstrate mobility of moving components, including swinging and sliding doors, cabinets, and windows with operable sash, for inspection by the Contracting Officer. Perform this demonstration after appropriate curing and drying times of coatings have elapsed and prior to invoicing for final payment.

TABLE 1

EXTERIOR METAL SURFACES

A. New Steel that has been blast-cleaned (up to SSPC SP 6):

1. [Primer:	FS TT-P-664	1.5 mils DFT
Intermediate:	CID A-A-3067 [semigloss][gloss]	1.5 mils DFT
Topcoat:	CID A-A-3067 [semigloss][gloss]	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer:	MPI 79	1.5 mils DFT
Intermediate:	MPI 94 (semigloss)	1.5 mils DFT
Topcoat:	MPI 94 (semigloss)	1.5 mils DFT]
[Primer:	MPI 79	1.5 mils DFT
Intermediate:	MPI 9 (gloss)	1.5 mils DFT
Topcoat:	MPI 9 (gloss)	1.5 mils DFT]]

B. Existing steel that has been spot-blasted (up to SSPC SP 6):

1. [Surface previously coated with alkyd or latex:		
Spot Primer:	MPI 101	1.5 mils DFT
Intermediate:	MPI 110 [1 (gloss)][2 (semigloss)]	1.5 mils DFT
Topcoat:	MPI 110 [1 (gloss)][2 (semigloss)]	1.5 mils DFT]
2. [Surface previously coated with epoxy:		
Spot Primer:	MIL-DTL-24441 /29 Formula 150 Type IV	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	[[CID A-A-50570 (semigloss)	1.5 mils DFT]
	[MIL-PRF-85285 (gloss)	1.5 mils DFT]]

C. New [and existing] steel blasted to SSPC SP 10:

1. Primer:	MIL-DTL-24441 /29 Formula 150 Type IV	3.0 mils DFT
Intermediate:	MIL-DTL-24441 /31 Formula 152 Type IV	3.0 mils DFT

TABLE 1

	EXTERIOR METAL SURFACES	
Topcoat:	[[CID A-A-50570 (semigloss)	1.5 mils DFT]
	[MIL-PRF-85285 (gloss)	2.0 mils DFT]]
	EXTERIOR METAL SURFACES (GALVANIZED)	
D. New galvanized surfaces:		
1. [Primer:	FS TT-P-19 (flat)	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	FS TT-P-19 (flat)	1.5 mils DFT
	EQUIVALENT CROSS-OVER MATCH	
Primer:	MPI 10 (flat)	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	MPI 10 (flat)	1.5 mils DFT]
2. [Primer:	FS TT-P-19 (flat)	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	FS TT-E-2784 [(semigloss)][(gloss)]	1.5 mils DFT
	EQUIVALENT CROSS-OVER MATCH	
[Primer:	MPI 10 (flat)	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	MPI 11 (semigloss)	1.5 mils DFT]
[Primer:	MPI 10 (flat)	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	MPI 119 (gloss)	1.5 mils DFT]]
3. [Primer:	CID A-A-50557	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	CID A-A-50570 (semigloss)	1.5 mils DFT
	EQUIVALENT CROSS-OVER MATCH	
Primer:	MPI 134	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	MPI 110 [2 (semigloss)][1 (gloss)]	1.5 mils DFT]
4. [Primer:	Mil-DTL-24441/29 Formula 150 Type IV	2.0 mils DFT
Intermediate:	N/A	
Topcoat:	[[CID A-A-50570 (semigloss)	1.5 mils DFT]
	[MIL-PRF-85285 (gloss)	1.5 mils DFT]]
	EQUIVALENT CROSS-OVER MATCH	
Primer:	SSPC Paint 22	2.0 mils DFT
Intermediate:	N/A	
Topcoat:	SSPC Paint 104 (gloss)	1.0 mils DFT]
E. Galvanized surfaces with slight coating deterioration; little or no		

TABLE 1

EXTERIOR METAL SURFACES

rusting:

1. [Spot Prime: CID A-A-50557 3.0 mils DFT
Intermediate: N/A
Topcoat: CID A-A-50570 (semigloss) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- | | | |
|---------------|-----------------------|---------------|
| Primer: | MPI 134 | 1.5 mils DFT |
| Intermediate: | N/A | |
| Topcoat: | MPI 110 2 (semigloss) | 1.5 mils DFT] |
-
- | | | |
|-----------------|---------------------------------------|---------------|
| 2. [Spot Prime: | MIL-DTL-24441 /29 Formula 150 Type IV | 3.0 mils DFT |
| Intermediate: | N/A | |
| Topcoat: | MIL-PRF-85285 (gloss) | 2.0 mils DFT] |

F. Galvanized surfaces with severely deteriorated coating or rusting:

1. [Primer: MIL-DTL-24441 /29 Formula 150 Type IV 3.0 mils DFT
Intermediate: MIL-DTL-24441 /31 Formula 152 Type IV 3.0 mils DFT
Topcoat: [CID A-A-50570 (semigloss) 1.5 mils DFT]
[MIL-PRF-85285 (gloss) 2.0 mils DFT]]
2. [Primer: MPI 101 2.5 mils DFT
Intermediate: MPI 98 2.5 mils DFT
Topcoat: MPI 110 [2 (semigloss)][1 (gloss)] 2.0 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer:	SSPC Paint 22	2.5 mils DFT
Intermediate:	SSPC Paint 22	2.5 mils DFT
Topcoat:	SSPC Paint 24 (semigloss)	2.0 mils DFT]

OTHER EXTERIOR METAL SURFACES

G. [Terne-coated and other] Metal, except roof surfaces, not otherwise specified:

1. [Primer: FS TT-P-664 2.0 mils DFT
Intermediate: CID A-A-3067 [(semigloss)][(gloss)] 1.5 mils DFT
Topcoat: CID A-A-3067 [(semigloss)][(gloss)] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- | | | |
|---------------|--------------------|---------------|
| [Primer: | MPI 79 | 1.5 mils DFT |
| Intermediate: | MPI 94 (semigloss) | 1.5 mils DFT |
| Topcoat: | MPI 94 (semigloss) | 1.5 mils DFT] |
-
- | | | |
|---------------|---------------|----------------|
| [Primer: | MPI 79 | 1.5 mils DFT |
| Intermediate: | MPI 9 (gloss) | 1.5 mils DFT |
| Topcoat: | MPI 9 (gloss) | 1.5 mils DFT]] |
2. [Primer: FS TT-P-664 1.5 mils DFT
Intermediate: CID A-A-50570 (semigloss) 1.5 mils DFT

TABLE 1

EXTERIOR METAL SURFACES

Topcoat:	CID A-A-50570 (semigloss)	1.5 mils DFT
----------	---------------------------	--------------

EQUIVALENT CROSS-OVER MATCH

Primer:	MPI 79	1.5 mils DFT
Intermediate:	MPI 110 [2 (semigloss)][1 (gloss)]	1.5 mils DFT
Topcoat:	MPI 110 [2 (semigloss)][1 (gloss)]	1.5 mils DFT]

H. Existing roof surfaces previously coated:

1. [ASTM D 2824: Sufficient coats to provide not less than 8.0 mils]

2. [Primer:	FS TT-P-38	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	FS TT-P-38	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer:	MPI 1	1.5 mils DFT
Intermediate:	N/A	
Topcoat:	MPI 1	1.5 mils DFT]

TABLE 2

INTERIOR METAL SURFACES

A. Metal (except floors) not otherwise specified:

1. [Primer	- (non-shop-primed surfaces): FS TT-P-664	2.0 mils DFT
Intermediate:	CID A-A-2962 [flat][Note **][semigloss][gloss]	1.5 mils DFT
Topcoat:	CID A-A-2962 [flat][Note **][semigloss][gloss]	1.5 mils DFT

[NOTE **: Eggshell shall conform to a gloss at 60 degrees between 10 and 25 units in accordance with ASTM D 523.]

EQUIVALENT CROSS-OVER MATCH

[Primer	- (non-shop-primed surfaces): MPI 79	2.0 mils DFT
Intermediate:	MPI 49 (flat)	1.5 mils DFT
Topcoat:	MPI 49 (flat)	1.5 mils DFT]

[Primer	- (non-shop-primed surfaces): MPI 79	2.0 mils DFT
Intermediate:	MPI 51 (eggshell)	1.5 mils DFT
Topcoat:	MPI 51 (eggshell)	1.5 mils DFT]

[Primer

TABLE 2

INTERIOR METAL SURFACES

- (non-shop-primed surfaces):	MPI 79	2.0 mils DFT
Intermediate:	MPI 47 (semigloss)	1.5 mils DFT
Topcoat:	MPI 47 (semigloss)	1.5 mils DFT]
[Primer		
- (non-shop-primed surfaces):	MPI 79	2.0 mils DFT
Intermediate:	MPI 48 (gloss)	1.5 mils DFT
Topcoat:	MPI 48 (gloss)	1.5 mils DFT]]
2. [Primer		
(non-shop-primed surfaces):	FS TT-P-664	2.0 mils DFT
Intermediate:	CID A-A-2246, [flat][eggshell][semigloss]	1.5 mils DFT
Topcoat:	CID A-A-2246, [flat][eggshell][semigloss]	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer:	MPI 79	2.5 mils DFT
Intermediate:	MPI 138 (flat)	1.5 mils DFT
Topcoat:	MPI 138 (flat)	1.5 mils DFT]
[Primer:	MPI 79	2.5 mils DFT
Intermediate:	MPI 139 (eggshell)	1.5 mils DFT
Topcoat:	MPI 139 (eggshell)	1.5 mils DFT]
[Primer:	MPI 79	2.5 mils DFT
Intermediate:	MPI 141 (semigloss)	1.5 mils DFT
Topcoat:	MPI 141 (semigloss)	1.5 mils DFT]]

B. Metal floors (non-shop-primed surfaces):

1. Primer:	FS TT-P-664	2.0 mils DFT
Intermediate:	MIL-C-24667 (non-skid)	5.0-10.0 mils DFT
Topcoat:	MIL-C-24667 (non-skid)	5.0-10.0 mils DFT

C. Metal floors (non-slip deck surfaces):

1. Primer:	MIL-DTL-24441/29 Formula 150 Type IV	3.0 mils DFT
Intermediate:	MIL-C-24667 (non-skid)	5.0-10.0 mils DFT
Topcoat:	MIL-C-24667 (non-skid)	5.0-10.0 mils DFT

D. Metal in toilets [and other high-humidity areas]:

1. [Primer		
- (non-shop-primed surfaces):	FS TT-P-664	2.0 mils DFT
Intermediate:	CID A-A-2962 [flat][Note **][semigloss][gloss]	1.5 mils DFT
Topcoat:	CID A-A-2962 [flat][Note **][semigloss][gloss]	1.5 mils DFT

[NOTE **: Eggshell shall conform to a gloss at 60 degrees between 10 and 25 units in accordance with ASTM D 523.]

EQUIVALENT CROSS-OVER MATCH

[[Primer		
- (non-shop-primed surfaces):	MPI 79	2.0 mils DFT

TABLE 2

INTERIOR METAL SURFACES		
Intermediate:	MPI 49 (flat)	1.5 mils DFT
Topcoat:	MPI 49 (flat)	1.5 mils DFT]
[Primer		
- (non-shop-primed surfaces):	MPI 79	2.0 mils DFT
Intermediate:	MPI 51 (eggshell)	1.5 mils DFT
Topcoat:	MPI 51 (eggshell)	1.5 mils DFT]
[Primer		
- (non-shop-primed surfaces):	MPI 79	2.0 mils DFT
Intermediate:	MPI 47 (semigloss)	1.5 mils DFT
Topcoat:	MPI 47 (semigloss)	1.5 mils DFT]
[Primer		
- (non-shop-primed surfaces):	MPI 79	2.0 mils DFT
Intermediate:	MPI 48 (gloss)	1.5 mils DFT
Topcoat:	MPI 48 (gloss)	1.5 mils DFT]]

TABLE 3

BUILDING SYSTEMS SURFACES: INTERIOR AND EXTERIOR

Mechanical, electrical, [Fire extinguishing sprinkler systems including valves, conduit, hangers, supports,] [exposed copper piping,] and miscellaneous metal items, except hot metal surfaces and new prefinished equipment.

A. Surfaces not adjacent to painted surfaces:

1. [Primer:	FS TT-P-664	2.0 mils DFT
Intermediate:	CID A-A-2962 [(semigloss)][(gloss)]	1.5 mils DFT
Topcoat:	CID A-A-2962 [(semigloss)][(gloss)]	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer:	MPI 79	1.5 mils DFT
Intermediate:	MPI 47 (semigloss)	1.5 mils DFT
Topcoat:	MPI 47 (semigloss)	1.5 mils DFT]

[Primer:	MPI 79	1.5 mils DFT
Intermediate:	MPI 48 (gloss)	1.5 mils DFT
Topcoat:	MPI 48 (gloss)	1.5 mils DFT]]

2. [Primer:	TT-P-664	1.5 mils DFT
Intermediate:	CID A-A-50570 (semigloss)	1.5 mils DFT
Topcoat:	CID A-A-50570 (semigloss)	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

TABLE 3

BUILDING SYSTEMS SURFACES: INTERIOR AND EXTERIOR

Primer:	MPI 79	1.5 mils DFT
Intermediate:	MPI 110 [1 (gloss)][2 (semigloss)]	1.5 mils DFT
Topcoat:	MPI 110 [1 (gloss)][2 (semigloss)]	1.5 mils DFT]

B. Surfaces adjacent to painted surfaces: Coating systems as specified.
Color of topcoat to match adjacent surfaces: 0.0375 mm DFT for each coat.

C. New [fire extinguishing sprinkler systems,] exposed piping [and equipment]:

1. [Primer:	FS TT-P-664	1.5 mils DFT
Intermediate:	CID A-A-2962 [(semigloss)][(gloss)]	1.5 mils DFT
Topcoat:	CID A-A-2962 [(semigloss)][(gloss)]	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer:	MPI 79	1.5 mils DFT
Intermediate:	MPI 47 (semigloss)	1.5 mils DFT
Topcoat:	MPI 47 (semigloss)	1.5 mils DFT]
[Primer:	MPI 79	1.5 mils DFT
Intermediate:	MPI 48 (gloss)	1.5 mils DFT
Topcoat:	MPI 48 (gloss)	1.5 mils DFT]]

2. [Primer:	MIL-DTL-24441 /29 Formula 150, Type IV	3.0 mils DFT
Intermediate:	N/A	
Topcoat:	MIL-DTL-24441 /31 Formula 152, Type IV	3.0 mils DFT]

3. [Primer:	MIL-DTL-24441 /29 Formula 150, Type IV	3.0 mils DFT
Intermediate:	N/A	
Topcoat:	MIL-PRF-85285 (gloss)	2.0 mils DFT]

D. Hot metal surfaces [including smokestacks] subject to temperatures up to 650 degrees F:

1. [Primer:	N/A	
Intermediate:	CID A-A-3054	1.5 mils DFT
Topcoat:	CID A-A-3054	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer:	N/A	
Intermediate:	MPI 2	1.5 mils DFT
Topcoat:	MPI 2	1.5 mils DFT]

2. [Primer:	N/A	
Intermediate:	SSPC Paint 20 Type I-[_____]	_._ mils DFT
Topcoat:	SSPC Paint 20 Type I-[_____]	_._ mils DFT]

E. [New surfaces][and] [Existing surfaces] made bare cleaning SSPC SP 10 subject to temperatures up to 1100 degrees F:

1. [Primer:	N/A
-------------	-----

TABLE 3

BUILDING SYSTEMS SURFACES: INTERIOR AND EXTERIOR		
Intermediate:	FS TT-P-28	1.5 mils DFT
Topcoat:	FS TT-P-28	1.5 mils DFT
EQUIVALENT CROSS-OVER MATCH		
Primer:	N/A	
Intermediate:	MPI 22	1.5 mils DFT
Topcoat:	MPI 22	1.5 mils DFT]
F. Insulation and surfaces of insulation coverings:		
1. [Primer:	N/A	
Intermediate:	FS TT-P-19 (flat)	1.5 mils DFT
Topcoat:	FS TT-P-19 (flat)	1.5 mils DFT
EQUIVALENT CROSS-OVER MATCH		
Primer:	N/A	
Intermediate:	MPI 10 (flat)	1.5 mils DFT
Topcoat:	MPI 10 (flat)	1.5 mils DFT]
2. [Primer:	N/A	
Intermediate:	FS TT-E-2784 [(semigloss)][(gloss)]	1.5 mils DFT
Topcoat:	FS TT-E-2784 [(semigloss)][(gloss)]	1.5 mils DFT
EQUIVALENT CROSS-OVER MATCH		
[Primer:	N/A	
Intermediate:	MPI 11 (semigloss)	1.5 mils DFT
Topcoat:	MPI 11 (semigloss)	1.5 mils DFT]
[Primer:	N/A	
Intermediate:	MPI 119 (gloss)	1.5 mils DFT
Topcoat:	MPI 119 (gloss)	1.5 mils DFT]]
G. Cloth and paper covering on insulation:		
1. Primer:	Glue size and primer recommended by material manufacturer, one coat each.	
Intermediate:	N/A	
Topcoat:	Coating to match adjacent surfaces.	

TABLE 4

EXTERIOR CONCRETE, CONCRETE MASONRY, STUCCO, AND ASBESTOS-CEMENT SURFACES		
A. New [and existing] concrete; including soffits but excluding tops of slabs:		
1. [Primer:	As recommended by manufacturer of FS TT-P-19	
Intermediate:	FS TT-P-19 (flat)	1.5 mils DFT

TABLE 4

EXTERIOR CONCRETE, CONCRETE MASONRY, STUCCO, AND
ASBESTOS-CEMENT SURFACES

Topcoat: FS TT-P-19 (flat) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer: As recommended by manufacturer of MPI 10
Intermediate: MPI 10 (flat) 1.5 mils DFT
Topcoat: MPI 10 (flat) 1.5 mils DFT]

2. [Primer: As recommended by manufacturer of FS TT-E-2784
Intermediate: FS TT-E-2784 [(semigloss)][(gloss)] 1.5 mils DFT
Topcoat: FS TT-E-2784 [(semigloss)][(gloss)] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer: As recommended by manufacturer of MPI 11
Intermediate: MPI 11 (semigloss) 1.5 mils DFT
Topcoat: MPI 11 (semigloss) 1.5 mils DFT]

[Primer: N/A
Intermediate: MPI 119 (gloss) 1.5 mils DFT
Topcoat: MPI 119 (gloss) 1.5 mils DFT]]

3. [Primer: As recommended by manufacturer of FS TT-C-555
Intermediate: FS TT-C-555, Type II (see note)
Topcoat: FS TT-C-555, Type II (see note)

NOTE: Sufficient coats to provide no less than 20 mils of finished
coating system. Texture: [sand] [coarse]]

4. [Primer: As recommended by manufacturer of MPI 113
Intermediate: MPI 113 (see note)
Topcoat: MPI 113 (see note)

NOTE: Sufficient coats to provide no less than 16 to 18 mils of finished
coating system. Texture: smooth]

B. New [and existing] concrete masonry on uncoated surface:

1. [Primer: CID A-A-1500 [on existing surface imperfections]
Intermediate: FS TT-P-19 (flat) 1.5 mils DFT
Topcoat: FS TT-P-19 (flat) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer: MPI 4 [on existing surface imperfections] 1.5 mils DFT
Intermediate: MPI 10 (flat) 1.5 mils DFT
Topcoat: MPI 10 (flat) 1.5 mils DFT]

2. [Primer: CID A-A-1500 [on existing surface imperfections]
Intermediate: FS TT-P-19 (flat) 1.5 mils DFT
Topcoat: FS TT-E-2784 [(semigloss)][(gloss)] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

TABLE 4

EXTERIOR CONCRETE, CONCRETE MASONRY, STUCCO, AND
ASBESTOS-CEMENT SURFACES

[Primer:	MPI 4	[on existing surface imperfections]	1.5 mils DFT
Intermediate:	MPI 11	(semigloss)	1.5 mils DFT
Topcoat:	MPI 11	(semigloss)	1.5 mils DFT]
[Primer:	MPI 4	[on existing surface imperfections]	1.5 mils DFT
Intermediate:	MPI 119	(gloss)	1.5 mils DFT
Topcoat:	MPI 119	(gloss)	1.5 mils DFT]]

- 3. [Primer: As recommended by manufacturer of FS TT-C-555
- Intermediate: FS TT-C-555, Type II (see note)
- Topcoat: FS TT-C-555, Type II (see note)

NOTE: Sufficient coats to provide no less than 20 mils of finished coating system. Texture: [sand] [coarse]]

- 4. [Primer: As recommended by manufacturer of MPI 113
- Intermediate: MPI 113 (see note)
- Topcoat: MPI 113 (see note)

NOTE: Sufficient coats to provide no less than 16 to 18 mils of finished coating system. Texture: smooth]

C. New [and existing] stucco:

- 1. [Primer: FS TT-P-19 New work or spot prime existing 1.5 mils DFT
- Intermediate: FS TT-P-19 (flat) 1.5 mils DFT
- Topcoat: FS TT-P-19 (flat) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer:	MPI 10	New work or spot prime existing	1.5 mils DFT
Intermediate:	MPI 10	(flat)	1.5 mils DFT
Topcoat:	MPI 10	(flat)	1.5 mils DFT]

- 2. [Primer: FS TT-P-19 New work or spot prime existing 1.5 mils DFT
- Intermediate: FS TT-E-2784 [(semigloss)][(gloss)] 1.5 mils DFT
- Topcoat: FS TT-E-2784 [(semigloss)][(gloss)] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer:	MPI 11	New work or spot prime existing	1.5 mils DFT
Intermediate:	MPI 11	(semigloss)	1.5 mils DFT
Topcoat:	MPI 11	(semigloss)	1.5 mils DFT]

[Primer:	MPI 119	New work or spot prime existing	1.5 mils DFT
Intermediate:	MPI 119	(gloss)	1.5 mils DFT
Topcoat:	MPI 119	(gloss)	1.5 mils DFT]]

- 3. [Primer: As recommended by manufacturer of FS TT-C-555
- Intermediate: FS TT-C-555, Type II (see note)
- Topcoat: FS TT-C-555, Type II (see note)

NOTE: Sufficient coats to provide no less than 20 mils of finished

TABLE 4

EXTERIOR CONCRETE, CONCRETE MASONRY, STUCCO, AND ASBESTOS-CEMENT SURFACES coating system. Texture: [sand] [coarse]]

4. [Primer: As recommended by manufacturer of MPI 113
Intermediate: MPI 113 (see note)
Topcoat: MPI 113 (see note)

NOTE: Sufficient coats to provide no less than 16 to 18 mils of finished coating system. Texture: Smooth]

D. Asbestos cement:

1. [Primer: FS TT-P-19 New work or spot prime existing 1.5 mils DFT
Intermediate: FS TT-P-19 (flat) 1.5 mils DFT
Topcoat: FS TT-P-19 (flat) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- Primer: MPI 10 New work or spot prime existing 1.5 mils DFT
Intermediate: MPI 10 (flat) 1.5 mils DFT
Topcoat: MPI 10 (flat) 1.5 mils DFT]

2. [Primer: FS TT-P-19 New work or spot prime existing 1.5 mils DFT
Intermediate: FS TT-E-2784 [(semigloss)][(gloss)] 1.5 mils DFT
Topcoat: FS TT-E-2784 [(semigloss)][(gloss)] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- [Primer: MPI 11 New work or spot prime existing 1.5 mils DFT
Intermediate: MPI 11 (semigloss) 1.5 mils DFT
Topcoat: MPI 11 (semigloss) 1.5 mils DFT]

- [Primer: MPI 119 New work or spot prime existing 1.5 mils DFT
Intermediate: MPI 119 (gloss) 1.5 mils DFT
Topcoat: MPI 119 (gloss) 1.5 mils DFT]]

TABLE 5

INTERIOR CONCRETE, CONCRETE MASONRY, [PLASTER][AND][WALLBOARD] SURFACES

A. Concrete not specified otherwise, except floors [and ceilings]:

1. [Primer: CID A-A-2994, Type II 1.5 mils DFT
Intermediate: FS TT-P-29 (flat) 1.5 mils DFT
Topcoat: FS TT-P-29 (flat) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- Primer: MPI 50 1.5 mils DFT
Intermediate: MPI 53 (flat) 1.5 mils DFT

TABLE 5

INTERIOR CONCRETE, CONCRETE MASONRY, [PLASTER][AND][WALLBOARD] SURFACES
 Topcoat: MPI 53 (flat) 1.5 mils DFT]

2. [Primer: CID A-A-2994, Type II 1.5 mils DFT
 Intermediate: FS TT-E-2784, [Note **][semigloss] 1.5 mils DFT
 Topcoat: FS TT-E-2784, [Note **][semigloss] 1.5 mils DFT

[NOTE **: Eggshell shall conform to a gloss at 60 degrees between 10 and 25 units in accordance with ASTM D 523.]

EQUIVALENT CROSS-OVER MATCH

[Primer: MPI 50 1.5 mils DFT
 Intermediate: MPI 52 (eggshell) 1.5 mils DFT
 Topcoat: MPI 52 (eggshell) 1.5 mils DFT]

[Primer: MPI 50 1.5 mils DFT
 Intermediate: MPI 54 (semigloss) 1.5 mils DFT
 Topcoat: MPI 54 (semigloss) 1.5 mils DFT]]

3. [Primer: CID A-A-2994, Type II 2.0 mils DFT
 Intermediate: CID A-A-2246, [flat][eggshell][semigloss] 1.5 mils DFT
 Topcoat: CID A-A-2246, [flat][eggshell][semigloss] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 138 (flat) 1.5 mils DFT
 Topcoat: MPI 138 (flat) 1.5 mils DFT]

[Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 139 (eggshell) 1.5 mils DFT
 Topcoat: MPI 139 (eggshell) 1.5 mils DFT]

[Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 141 (semigloss) 1.5 mils DFT
 Topcoat: MPI 141 (semigloss) 1.5 mils DFT]]

B. Concrete ceilings, uncoated:

1. [Primer: As recommended by manufacturer of FS TT-C-555
 Intermediate: FS TT-C-555 Type I (see note)
 Topcoat: FS TT-C-555 Type I (see note)

NOTE: Sufficient coats to provide no less than 20 mils of finished coating system. Texture: [sand] [coarse]]

2. [[Primer: As recommended by manufacturer of MPI 41
 Intermediate: MPI 41 coarse texture (see note)
 Topcoat: MPI 41 coarse texture (see note)]

[Primer: As recommended by manufacturer of MPI 42
 Intermediate: MPI 42 medium texture (see note)
 Topcoat: MPI 42 medium texture (see note)]

TABLE 5

INTERIOR CONCRETE, CONCRETE MASONRY, [PLASTER][AND][WALLBOARD] SURFACES
 NOTE: Sufficient coats to provide no less than 16 to 18 mils of coating.]

C. Concrete, except floors, in toilets [and other high humidity areas:]

- | | | |
|---------------|---------------------------|--------------|
| 1. [Primer: | CID A-A-2994, Type II | 1.5 mils DFT |
| Intermediate: | CID A-A-50574 (semigloss) | 1.5 mils DFT |
| Topcoat: | CID A-A-50574 (semigloss) | 1.5 mils DFT |

EQUIVALENT CROSS-OVER MATCH

- | | | |
|---------------|--------------------|---------------|
| Primer: | MPI 50 | 1.5 mils DFT |
| Intermediate: | MPI 47 (semigloss) | 1.5 mils DFT |
| Topcoat: | MPI 47 (semigloss) | 1.5 mils DFT] |
- | | | |
|---------------|---------------------------------------|--------------|
| 2. [Primer: | MIL-DTL-24441 /29 Formula 150 Type IV | 3.0 mils DFT |
| Intermediate: | N/A | |
| Topcoat: | MIL-DTL-24441*/27 Formula 157 Type IV | 3.0 mils DFT |

NOTE * or: Type IV topcoat formulas in other colors may be selected]

- | | | |
|---------------|---|--------------|
| 3. [Primer: | CID A-A-2994, Type II | 2.0 mils DFT |
| Intermediate: | CID A-A-2246, [flat][eggshell][semigloss] | 1.5 mils DFT |
| Topcoat: | CID A-A-2246, [flat][eggshell][semigloss] | 1.5 mils DFT |

EQUIVALENT CROSS-OVER MATCH

- | | | |
|---------------|----------------|---------------|
| [Primer: | MPI 50 | 2.0 mils DFT |
| Intermediate: | MPI 138 (flat) | 1.5 mils DFT |
| Topcoat: | MPI 138 (flat) | 1.5 mils DFT] |
- | | | |
|---------------|--------------------|---------------|
| [Primer: | MPI 50 | 2.0 mils DFT |
| Intermediate: | MPI 139 (eggshell) | 1.5 mils DFT |
| Topcoat: | MPI 139 (eggshell) | 1.5 mils DFT] |
- | | | |
|---------------|---------------------|----------------|
| [Primer: | MPI 50 | 2.0 mils DFT |
| Intermediate: | MPI 141 (semigloss) | 1.5 mils DFT |
| Topcoat: | MPI 141 (semigloss) | 1.5 mils DFT]] |
- | | | |
|---------------|---------------------|---------------|
| 4. [Primer: | CID A-A-3120 Type C | 1.5 mils DFT |
| Intermediate: | N/A | |
| Topcoat: | CID A-A-3120 Type C | 1.5 mils DFT] |

D. Concrete masonry:

- | | | |
|---------------|---|--------------|
| 1. [Filler: | CID A-A-1500 (Fill all holes in masonry surfaces) | |
| Primer: | CID A-A-2994, Type II | 2.0 mils DFT |
| Intermediate: | CID A-A-2246, [flat][eggshell][semigloss] | 1.5 mils DFT |
| Topcoat: | CID A-A-2246, [flat][eggshell][semigloss] | 1.5 mils DFT |

EQUIVALENT CROSS-OVER MATCH

- | | | |
|---------------|---|--------------|
| [Filler: | MPI 4 (Fill all holes in masonry surface) | |
| Primer: | MPI 50 | 2.0 mils DFT |
| Intermediate: | MPI 138 (flat) | 1.5 mils DFT |

TABLE 5

INTERIOR CONCRETE, CONCRETE MASONRY, [PLASTER][AND][WALLBOARD] SURFACES
 Topcoat: MPI 138 (flat) 1.5 mils DFT]

[Filler: MPI 4 (fill all holes in masonry surface)
 Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 139 (eggshell) 1.5 mils DFT
 Topcoat: MPI 139 (eggshell) 1.5 mils DFT]

[Filler: MPI 4 (fill all holes in masonry surface)
 Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 141 (semigloss) 1.5 mils DFT
 Topcoat: MPI 141 (semigloss) 1.5 mils DFT]]

E. Concrete masonry in toilets [and high humidity areas]:

1. [Filler: CID A-A-1500 (fill all holes in masonry surface)
 Primer: CID A-A-2994, Type II 1.5 mils DFT
 Intermediate: CID A-A-2246, [flat][eggshell][semigloss] 1.5 mils DFT
 Topcoat: CID A-A-2246, [flat][eggshell][semigloss] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Filler: MPI 4 (Fill all holes in masonry surface)
 Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 138, (flat) 1.5 mils DFT
 Topcoat: MPI 138, (flat) 1.5 mils DFT]

[Filler: MPI 4 (Fill all holes in masonry surface)
 Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 139, (eggshell) 1.5 mils DFT
 Topcoat: MPI 139, (eggshell) 1.5 mils DFT]

[Filler: MPI 4 (Fill all holes in masonry surfaces)
 Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 141, (semigloss) 1.5 mils DFT
 Topcoat: MPI 141, (semigloss) 1.5 mils DFT]]

2. [Filler: CID A-A-1500 (fill all holes in masonry surface)
 Primer: CID A-A-2994, Type II 1.5 mils DFT
 Intermediate: CID A-A-2962, [flat][NOTE **][semigloss] 1.5 mils DFT
 Topcoat: CID A-A-2962, [flat][NOTE **][semigloss] 1.5 mils DFT

[NOTE **: Eggshell shall conform to a gloss at 60 degrees between 10 and 25 units in accordance with ASTM D 523.]

EQUIVALENT CROSS-OVER MATCH

[Filler: MPI 4 (Fill all holes in masonry surface)
 Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 49, (flat) 1.5 mils DFT
 Topcoat: MPI 49, (flat) 1.5 mils DFT]

[Filler: MPI 4 (Fill all holes in masonry surface)
 Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 51, (eggshell) 1.5 mils DFT

TABLE 5

INTERIOR CONCRETE, CONCRETE MASONRY, [PLASTER][AND][WALLBOARD] SURFACES
 Topcoat: MPI 51, (eggshell) 1.5 mils DFT]

[Filler: MPI 4 (Fill all holes in masonry surfaces)
 Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 47, (semigloss) 1.5 mils DFT
 Topcoat: MPI 47, (semigloss) 1.5 mils DFT]]

3. [Primer: MIL-DTL-24441 /29 Formula 150 Type IV 3.0 mils DFT
 Intermediate: N/A
 Topcoat: MIL-DTL-24441* /31 Formula 152 Type IV 3.0 mils DFT

NOTE * or: Type IV topcoat formulas in other colors may be selected]

F. [Plaster] [and] [Wallboard] not otherwise specified:

1. [Primer: CID A-A-2994, Type II 1.5 mils DFT
 Intermediate: FS TT-P-29 (flat) 1.5 mils DFT
 Topcoat: FS TT-P-29 (flat) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer: MPI 50 1.5 mils DFT
 Intermediate: MPI 53 (flat) 1.5 mils DFT
 Topcoat: MPI 53 (flat) 1.5 mils DFT]]

2. [Primer: CID A-A-2994, Type II 1.5 mils DFT
 Intermediate: FS TT-E-2784, [(Note **)] [(semigloss)] 1.5 mils DFT
 Topcoat: FS TT-E-2784, [(Note **)] [(semigloss)] 1.5 mils DFT

[NOTE **: Eggshell shall conform to a gloss at 60 degrees between 10 and 25 units in accordance with ASTM D 523.]

EQUIVALENT CROSS-OVER MATCH

[Primer: MPI 50 1.5 mils DFT
 Intermediate: MPI 52 (eggshell) 1.5 mils DFT
 Topcoat: MPI 52 (eggshell) 1.5 mils DFT]]

[Primer: MPI 50 1.5 mils DFT
 Intermediate: MPI 54 (semigloss) 1.5 mils DFT
 Topcoat: MPI 54 (semigloss) 1.5 mils DFT]]

3. [Primer: CID A-A-2994, Type II 2.0 mils DFT
 Intermediate: CID A-A-2246, [flat][eggshell][semigloss] 1.5 mils DFT
 Topcoat: CID A-A-2246, [flat][eggshell][semigloss] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 138 (flat) 1.5 mils DFT
 Topcoat: MPI 138 (flat) 1.5 mils DFT]]

[Primer: MPI 50 2.0 mils DFT
 Intermediate: MPI 139 (eggshell) 1.5 mils DFT

TABLE 5

INTERIOR CONCRETE, CONCRETE MASONRY, [PLASTER][AND][WALLBOARD] SURFACES

Topcoat:	MPI 139 (eggshell)	1.5 mils DFT]
[Primer:	MPI 50	2.0 mils DFT
Intermediate:	MPI 141 (semigloss)	1.5 mils DFT
Topcoat:	MPI 141 (semigloss)	1.5 mils DFT]]

G. [Plaster] [and] [Wallboard] in toilets [and other high humidity areas]:

1. [Primer:	CID A-A-2994, Type II	2.0 mils DFT
Intermediate:	CID A-A-2246, [flat][eggshell][semigloss]	1.5 mils DFT
Topcoat:	CID A-A-2246, [flat][eggshell][semigloss]	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer:	MPI 50	2.0 mils DFT
Intermediate:	MPI 138 (flat)	1.5 mils DFT
Topcoat:	MPI 138 (flat)	1.5 mils DFT]

[Primer:	MPI 50	2.0 mils DFT
Intermediate:	MPI 139 (eggshell)	1.5 mils DFT
Topcoat:	MPI 139 (eggshell)	1.5 mils DFT]

[Primer:	MPI 50	2.0 mils DFT
Intermediate:	MPI 141 (semigloss)	1.5 mils DFT
Topcoat:	MPI 141 (semigloss)	1.5 mils DFT]]

2. [Primer		
- (non-shop-primed surfaces):	CID A-A-2994 Type II	2.0 mils DFT
Intermediate:	CID A-A-2962 [flat][Note **][semigloss]	1.5 mils DFT
Topcoat:	CID A-A-2962 [flat][Note **][semigloss]	1.5 mils DFT

[NOTE **: Eggshell shall conform to a gloss at 60 degrees between 10 and 25 units in accordance with ASTM D 523.]

EQUIVALENT CROSS-OVER MATCH

[[Primer		
- (non-shop-primed surfaces):	MPI 45	2.0 mils DFT
Intermediate:	MPI 49 (flat)	1.5 mils DFT
Topcoat:	MPI 49 (flat)	1.5 mils DFT]

[Primer		
- (non-shop-primed surfaces):	MPI 45	2.0 mils DFT
Intermediate:	MPI 51 (eggshell)	1.5 mils DFT
Topcoat:	MPI 51 (eggshell)	1.5 mils DFT]

[Primer		
- (non-shop-primed surfaces):	MPI 45	2.0 mils DFT
Intermediate:	MPI 47 (semigloss)	1.5 mils DFT
Topcoat:	MPI 47 (semigloss)	1.5 mils DFT]]

TABLE 5

INTERIOR CONCRETE, CONCRETE MASONRY, [PLASTER] [AND] [WALLBOARD] SURFACES

TABLE 6
EXTERIOR WOOD [AND PLYWOOD] SURFACES

A. Wood and plywood, trim, including top, bottom and edges of doors:

1.	[Primer:	CID A-A-2336	2.0 mils DFT
	Intermediate:	CID A-A-3067 [semigloss][gloss]	1.5 mils DFT
	Topcoat:	CID A-A-3067 [semigloss][gloss]	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[[Primer:	MPI 7	2.0 mils DFT
Intermediate:	MPI 94 (semigloss)	1.5 mils DFT
Topcoat:	MPI 94 (semigloss)	1.5 mils DFT]]

[Primer:	MPI 7	2.0 mils DFT
Intermediate:	MPI 9 (gloss)	1.5 mils DFT
Topcoat:	MPI 9 (gloss)	1.5 mils DFT]]

2.	[Primer:	CID A-A-2336	1.5 mils DFT
	Intermediate:	FS TT-E-2784, [(semigloss)][(gloss)]	1.5 mils DFT
	Topcoat:	FS TT-E-2784, [(semigloss)][(gloss)]	1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

[Primer:	MPI 7	1.5 mils DFT
Intermediate:	MPI 11 (semigloss)	1.5 mils DFT
Topcoat:	MPI 11 (semigloss)	1.5 mils DFT]]

[Primer:	MPI 7	1.5 mils DFT
Intermediate:	MPI 119 (gloss)	1.5 mils DFT
Topcoat:	MPI 119 (gloss)	1.5 mils DFT]]

[B. Existing wood previously coated with Alkyd finish coat:

1.	[Primer:	MPI 17	0.0375 mm DFT
	Intermediate:	MPI 11 (semigloss)	0.0375 mm DFT
	Topcoat:	MPI 11 (semigloss)	0.0375 mm DFT]]

[Primer:	MPI 17	0.0375 mm DFT
Intermediate:	MPI 119 (gloss)	0.0375 mm DFT
Topcoat:	MPI 119 (gloss)	0.0375 mm DFT]]

[C. Existing wood previously coated with latex finish coat:

1.	[Primer:	N/A	
	Intermediate:	MPI 11 (semigloss)	0.0375 mm DFT
	Topcoat:	MPI 11 (semigloss)	0.0375 mm DFT]]

[Primer:	N/A	
Intermediate:	MPI 119 (gloss)	0.0375 mm DFT

TABLE 6

EXTERIOR WOOD [AND PLYWOOD] SURFACES

Topcoat: MPI 119 (gloss) 0.0375 mm DFT]]

[D. Uncoated and previously stained wood siding:

1. Primer: N/A
 Intermediate: N/A
 Topcoat: FS TT-S-708 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer: N/A
 Intermediate: N/A
 Topcoat: [MPI 13 (semi-transparent) 1.5 mils DFT]
 [MPI 14 (solid color) 1.5 mils DFT]]

TABLE 7

INTERIOR WOOD AND PLYWOOD SURFACES

A. Wood and plywood not otherwise specified:

[Primer: CID A-A-2994 Type I on softwood plywood 1.5 mils DFT]
 Intermediate: CID A-A-2962, [NOTE **][semigloss][gloss] 1.5 mils DFT
 Topcoat: CID A-A-2962, [NOTE **][semigloss][gloss] 1.5 mils DFT

[NOTE **: Eggshell shall conform to a gloss at 60 degrees between 10 and 25 units in accordance with ASTM D 523.]

EQUIVALENT CROSS-OVER MATCH

[Primer: MPI 45 1.5 mils DFT
 Intermediate: MPI 51 (eggshell) 1.5 mils DFT
 Topcoat: MPI 51 (eggshell) 1.5 mils DFT]]

[Primer: MPI 45 1.5 mils DFT
 Intermediate: MPI 47 (semigloss) 1.5 mils DFT
 Topcoat: MPI 47 (semigloss) 1.5 mils DFT]]

[Primer: MPI 45 1.5 mils DFT
 Intermediate: MPI 48 (gloss) 1.5 mils DFT
 Topcoat: MPI 48 (gloss) 1.5 mils DFT]]

B. Wood [except floors], natural finish:

1. [Primer: N/A
 Intermediate: FS TT-S-711 1.5 mils DFT
 Topcoat: CID A-A-1800 (3 coats) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

Primer: N/A
 Intermediate: MPI 90 1.5 mils DFT
 Topcoat: MPI 28 (3 coats) 1.5 mils DFT]]

TABLE 7

INTERIOR WOOD AND PLYWOOD SURFACES

C. Plywood, natural finish:

- 1. Primer: N/A
- Intermediate: MPI 90 1.5 mils DFT
- Topcoat: MPI 57 (3 coats) 1.5 mils DFT

D. Wood floors, natural finish:

- 1. [Primer: N/A
- Intermediate: FS TT-S-711 1.5 mils DFT
- Topcoat: FS TT-C-542 (3 coats) 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- Primer: N/A
- Intermediate: MPI 90 (one coat) 1.5 mils DFT
- Topcoat: MPI 31 (three coats) 1.5 mils DFT]

- 2. [Primer: FS TT-C-542 Type I 1.5 mils DFT
- Intermediate: FS TT-C-542 Type I 1.5 mils DFT
- Topcoat: FS TT-C-542 Type I 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- Primer: MPI 31 (one coat) 1.5 mils DFT
- Intermediate: MPI 31 (one coat) 1.5 mils DFT
- Topcoat: MPI 31 (one coat) 1.5 mils DFT]

E. Wood surfaces in toilets [and other high humidity areas]:

- 1. [As specified in Section 09963, "High-Build Glaze Coatings."]
- 2. [Primer: CID A-A-2994 Type I 1.5 mils DFT
- Intermediate: CID A-A-2962, [(semigloss)][(gloss)] 1.5 mils DFT
- Topcoat: CID A-A-2962, [(semigloss)][(gloss)] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- [Primer: MPI 45 1.5 mils DFT
- Intermediate: MPI 47 (semigloss) 1.5 mils DFT
- Topcoat: MPI 47 (semigloss) 1.5 mils DFT]

- [Primer: MPI 45 1.5 mils DFT
- Intermediate: MPI 48 (gloss) 1.5 mils DFT
- Topcoat: MPI 48 (gloss) 1.5 mils DFT]

- 3. [Primer: CID A-A-2994 Type II 1.5 mils DFT
- Intermediate: CID A-A-2246 [(semigloss)][(gloss)] 1.5 mils DFT
- Topcoat: CID A-A-2246 [(semigloss)][(gloss)] 1.5 mils DFT

EQUIVALENT CROSS-OVER MATCH

- [Primer: MPI 50 1.5 mils DFT
- Intermediate: MPI 141 (semigloss) 1.5 mils DFT

TABLE 7

INTERIOR WOOD AND PLYWOOD SURFACES

Topcoat:	MPI 141 (semigloss)	1.5 mils DFT]
[Primer:	MPI 50	1.5 mils DFT
Intermediate:	MPI 114 (gloss)	1.5 mils DFT
Topcoat:	MPI 114 (gloss)	1.5 mils DFT]]

F. Natural finish wood doors:

1. [Primer: FS TT-S-711 (one coat)
Intermediate: CID A-A-2335 sealer (one coat) and sand with 220 grit
Topcoat: FS TT-C-542 (two coats)

EQUIVALENT CROSS-OVER MATCH

Primer:	MPI 90 (one coat)
Intermediate:	MPI 91 (one coat) and sand with 220 grit
Topcoat:	MPI 31 (two coats)]

-- End of Section --

SECTION 13281

ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS

09/00

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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z9.2 (1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems

ANSI Z88.2 (1992) Respiratory Protection

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 732 (1995) Aging Effects of Artificial Weathering on Latex Sealants

ASTM D 522 (1993; Rev. A) Mandrel Bend Test of Attached Organic Coatings

ASTM D 1331 (1989; R 1995) Surface and Interfacial Tension of Solutions of Surface-Active Agents

ASTM D 2794 (1993) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

ASTM E 84 (1998) Surface Burning Characteristics of Building Materials

ASTM E 96 (1995) Water Vapor Transmission of Materials

ASTM E 119 (1998) Fire Tests of Building Construction and Materials

ASTM E 736 (1992) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members

ASTM E 1368 (1997) Visual Inspection of Asbestos Abatement Projects

ASTM E 1494 (1992; R 1996) Encapsulants for Spray- or Trowel-Applied Friable Asbestos-Containing Building Materials

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.51	Sanitation
29 CFR 1926.200	Accident Prevention Signs and Tags
29 CFR 1926.59	Hazard Communication
29 CFR 1926.1101	Asbestos, Tremolite, Anthophyllite, Actinolite
40 CFR 61-SUBPART A	General Provisions
40 CFR 61-SUBPART M	National Emission Standard for Asbestos
40 CFR 763	Asbestos Containing Material in Schools

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 560/5-85-024	Guidance for Controlling Asbestos Containing Materials in Buildings
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NAVY DIRECTIVES (ND)

ND OPNAVINST 5100.23	(Rev. D) Navy Occupational Safety and Health (NAVOSH) Program Manual
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UNDERWRITERS LABORATORIES INC. (UL)

UL 586	(1996) High-Efficiency, Particulate, Air Filter Units
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VIRGINIA ADMINISTRATIVE CODE (VAC)

VAC 25-20-30	Notification and Permit Fee
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1.2 DEFINITIONS

1.2.1 ACM

Asbestos Containing Materials.

1.2.2 Amended Water

Water containing a wetting agent or surfactant with a maximum surface tension of 2.9 Pa 29 dynes per centimeter when tested in accordance with ASTM D 1331.

1.2.3 Area Sampling

Sampling of asbestos fiber concentrations which approximates the concentrations of asbestos in the theoretical breathing zone but is not

actually collected in the breathing zone of an employee.

1.2.4 Asbestos

The term asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, and actinolite asbestos and any of these minerals that has been chemically treated or altered. Materials are considered to contain asbestos if the asbestos content of the material is determined to be at least one percent.

1.2.5 Asbestos Control Area

That area where asbestos removal operations are performed which is isolated by physical boundaries which assist in the prevention of the uncontrolled release of asbestos dust, fibers, or debris.

1.2.6 Asbestos Fibers

Those fibers having an aspect ratio of at least 3:1 and longer than 5 micrometers as determined by National Institute for Occupational Safety and Health (NIOSH) Method 7400.

1.2.7 Asbestos Permissible Exposure Limit

0.1 fibers per cubic centimeter of air as an 8-hour time weighted average measured in the breathing zone as defined by 29 CFR 1926.1101 or other Federal legislation having legal jurisdiction for the protection of workers health.

1.2.8 Background

The ambient airborne asbestos concentration in an uncontaminated area as measured prior to any asbestos hazard abatement efforts. Background concentrations for other (contaminated) areas are measured in similar but asbestos free locations.

1.2.9 Contractor

The Contractor is that individual, or entity under contract to the Navy to perform the herein listed work.

1.2.10 Encapsulation

The abatement of an asbestos hazard through the appropriate use of chemical encapsulants.

1.2.11 Encapsulants

Specific materials in various forms used to chemically or physically entrap asbestos fibers in various configurations to prevent these fibers from becoming airborne. There are four types of encapsulants as follows which must comply with performance requirements as specified herein.

- a. Removal Encapsulant (can be used as a wetting agent)
- b. Bridging Encapsulant (used to provide a tough, durable surface coating to asbestos containing material)

- c. Penetrating Encapsulant (used to penetrate the asbestos containing material encapsulating all asbestos fibers and preventing fiber release due to routine mechanical damage)
- d. Lock-Down Encapsulant (used to seal off or "lock-down" minute asbestos fibers left on surfaces from which asbestos containing material has been removed).

1.2.12 Friable Asbestos Material

One percent asbestos containing material that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

1.2.13 Glovebag Technique

Those asbestos removal and control techniques put forth in 29 CFR 1926.1101 Appendix G.

1.2.14 HEPA Filter Equipment

High efficiency particulate air (HEPA) filtered vacuum and/or exhaust ventilation equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall retain 99.97 percent of particles 0.3 microns or larger as indicated in UL 586.

1.2.15 Navy Consultant (NC)

That qualified person employed directly by the Government to monitor, sample, inspect the work or in some other way advise the Contracting Officer. The NC is normally a private consultant, but can be an employee of the Government.

1.2.16 Negative Pressure Enclosure (NPE)

That engineering control technique described as a negative pressure enclosure in 29 CFR 1926.1101.

1.2.17 Nonfriable Asbestos Material

Material that contains asbestos in which the fibers have been immobilized by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not normally release asbestos fibers during any appropriate use, handling, storage or transportation. It is understood that asbestos fibers may be released under other conditions such as demolition, removal, or mishap.

1.2.18 Personal Sampling

Air sampling which is performed to determine asbestos fiber concentrations within the breathing zone of a specific employee, as performed in accordance with 29 CFR 1926.1101.

1.2.19 Private Qualified Person (PQP)

That qualified person hired by the Contractor to perform the herein listed tasks.

1.2.20 Qualified Person (QP)

A Registered Architect, Professional Engineer, Certified Industrial Hygienist, consultant or other qualified person who has successfully completed training and is therefore accredited under a legitimate State Model Accrediation Plan as described in 40 CFR 763 as a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer; and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The QP must be qualified to perform visual inspections as indicated in ASTM E 1368. The QP shall be appropriately licensed in the State of South Carolina.

1.2.21 TEM

Refers to Transmission Electron Microscopy.

1.2.22 Time Weighted Average (TWA)

The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers.

1.2.23 Wetting Agent

A chemical added to water to reduce the water's surface tension thereby increasing the water's ability to soak into the material to which it is applied. An equivalent wetting agent must have a surface tension of at most 2.9 Pa 29 dynes per centimeter when tested in accordance with ASTM D 1331.

1.3 REQUIREMENTS

1.3.1 Description of Work

The work covered by this section includes the handling and control of asbestos containing materials and describes some of the resultant procedures and equipment required to protect workers, the environment and occupants of the building or area, or both, from contact with airborne asbestos fibers. The work also includes the disposal of any asbestos containing materials generated by the work. More specific operational procedures shall be outlined in the Asbestos Hazard Abatement Plan called for elsewhere in this specification. The asbestos work includes the demolition and removal of floor tile and brown mastic located in the lobby, concessions, office, closet, storage room and vestibules. Under normal conditions non-friable or chemically bound materials containing asbestos would not be considered hazardous; however, this material may release airborne asbestos fibers during demolition and removal and therefore must be handled in accordance with the removal and disposal procedures as specified herein. Provide negative pressure enclosure techniques as outlined in this specification. The Navy will evacuate the work area during the asbestos abatement work.

1.3.2 Medical Requirements

Provide medical requirements including but not limited to medical surveillance and medical record keeping as listed in 29 CFR 1926.1101.

1.3.2.1 Medical Examinations

Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1926.1101 or other pertinent State or local directives. This requirement must have been satisfied within the 12 months prior to the start of work on this contract. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. Specifically identify x-ray films of asbestos workers to the consulting radiologist and mark medical record jackets with the word "ASBESTOS."

1.3.2.2 Medical Records

Maintain complete and accurate records of employees' medical examinations, medical records, and exposure data for a period of 50 years after termination of employment and make records of the required medical examinations and exposure data available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health (OSHA), or authorized representatives of them, and an employee's physician upon the request of the employee or former employee.

1.3.3 Employee Training

Submit certificates, prior to the start of work but after the main abatement submittal, signed by each employee indicating that the employee has received training in the proper handling of materials and wastes that contain asbestos in accordance with 40 CFR 763; understands the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of the respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in 29 CFR 1926.1101 on an initial and annual basis. Certificates shall be organized by individual worker, not grouped by type of certification. Train all personnel involved in the asbestos control work in accordance with United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) training criteria or State training criteria whichever is more stringent. The Contractor shall document the training by providing: dates of training, training entity, course outline, names of instructors, and qualifications of instructors upon request by the Contracting Officer. Furnish each employee with respirator training and fit testing administered by the PQP as required by 29 CFR 1926.1101. Fully cover engineering and other hazard control techniques and procedures.

1.3.4 Permits , Licenses, and Notifications

Obtain necessary permits and licenses in conjunction with asbestos removal, encapsulation, hauling, and disposition, and furnish notification of such actions required by Federal, State, regional, and local authorities prior to the start of work. Notify the State's environmental protection agency and the Contracting Officer in writing 20 working days prior to commencement of work in accordance with 40 CFR 61-SUBPART M and 16 VAC 25-20-30. Notify the Contracting Officer and other appropriate Government agencies in writing 20 working days prior to the start of asbestos work as indicated in applicable laws, ordinances, criteria, rules, and regulations. Submit copies of all Notifications to the Contracting Officer.

1.3.5 Environment, Safety and Health Compliance

In addition to detailed requirements of this specification, comply with those applicable laws, ordinances, criteria, rules, and regulations of Federal, State, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.1101, 40 CFR 61-SUBPART A, 40 CFR 61-SUBPART M, and ND OPNAVINST 5100.23. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the Government shall apply.

1.3.6 Respiratory Protection Program

Establish and implement a respirator program as required by ANSI Z88.2, 29 CFR 1926.1101, and 29 CFR 1926.103. Submit a written description of the program to the Contracting Officer. Submit a written program manual or operating procedure including methods of compliance with regulatory statutes.

1.3.6.1 Respirator Program Records

Submit records of the respirator program as required by ANSI Z88.2, 29 CFR 1926.103, and 29 CFR 1926.1101.

1.3.7 Asbestos Hazard Control Supervisor

The Contractor shall be represented on site by a supervisor, trained using the model Contractor accreditation plan as indicated in the Federal statutes for all portions of the herein listed work.

1.3.8 Hazard Communication

Adhere to all parts of 29 CFR 1926.59 and provide the Contracting Officer with a copy of the Material Safety Data Sheets (MSDS) for all materials brought to the site.

1.3.9 Asbestos Hazard Abatement Plan

Submit a detailed plan of the safety precautions such as lockout, tagout, tryout, equipment and work procedures to be used in the removal of materials containing asbestos. The plan, not to be combined with other hazard abatement plans, shall be prepared, signed, and sealed by the PQP. Provide a Table of Contents for each abatement submittal, which shall follow the sequence of requirements in the contract. Such plan shall include but not be limited to the precise personal protective equipment to be used including, but not limited to, respiratory protection, type of whole-body protection, the location of asbestos control areas including clean and dirty areas, buffer zones, showers, storage areas, change rooms, removal method, interface of trades involved in the construction, sequencing of asbestos related work, disposal plan, type of wetting agent and asbestos sealer to be used, locations of local exhaust equipment, planned air monitoring strategies, and a detailed description of the method to be employed in order to control environmental pollution. The plan shall also include (both fire and medical emergency) response plans. The Asbestos Hazard Abatement Plan must be approved in writing prior to starting any asbestos work. The Contractor, Asbestos Hazard Control Supervisor, and PQP shall meet with the Contracting Officer prior to

beginning work, to discuss in detail the Asbestos Hazard Abatement Plan, including work procedures and safety precautions. Once approved by the Contracting Officer, the plan will be enforced as if an addition to the specification. Any changes required in the specification as a result of the plan shall be identified specifically in the plan to allow for free discussion and approval by the Contracting Officer prior to starting work.

1.3.10 Testing Laboratory

Submit the name, address, and telephone number of each testing laboratory selected for the analysis, and reporting of airborne concentrations of asbestos fibers along with evidence that each laboratory selected holds the appropriate State license and/or permits and certification that each laboratory is American Industrial Hygiene Association (AIHA) accredited and that persons counting the samples have been judged proficient by current inclusion on the AIHA Asbestos Analysis Registry (AAR) and successful participation of the laboratory in the Proficiency Analytical Testing (PAT) Program. Where analysis to determine asbestos content in bulk materials or transmission electron microscopy is required, submit evidence that the laboratory is accredited by the National Institute of Science and Technology (NIST) under National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis.

1.3.11 Landfill Approval

Submit written evidence that the landfill for disposal is approved for asbestos disposal by the State regulatory agency(s). Submit to the Contracting Officer, waste shipment records, prepared in accordance with Federal regulations, signed and dated by an agent of the landfill, certifying the amount of asbestos materials delivered to the landfill, within 3 days after delivery. In those States that require a hazardous waste manifest the Contractor shall submit, within 3 days, signed copies of such to the Contracting Officer.

1.3.12 Medical Certification

Provide a written certification for each worker and supervisor, signed by a licensed physician indicating that the worker and supervisor has met or exceeded all of the medical prerequisites listed herein and in 29 CFR 1926.1101 and 29 CFR 1926.103 as prescribed by law. Submit certificates prior to the start of work but after the main abatement submittal.

1.4 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-03 Product Data

Local exhaust equipment; G OIC

Vacuums; G OIC

Respirators; G OIC

Pressure differential automatic recording instrument; G OIC

Amended water; G OIC

Material Safety Data Sheets (MSDS) for all materials proposed for transport to the project site; G OIC

Encapsulants; G OIC

SD-06 Test Reports

Air sampling results; G OIC

Pressure differential recordings for local exhaust system; G OIC

Asbestos disposal quantity report; G OIC

Encapsulation test patches; G OIC

Clearance sampling; G OIC

SD-07 Certificates

Asbestos hazard abatement plan; G OIC

Testing laboratory; G OIC

Private qualified person documentation; G OIC

Landfill approval; G OIC

Employee training; G OIC

Medical certification requirements; G OIC

Waste shipment records and if applicable exemption report; G OIC

Respiratory Protection Program; G OIC

Hazardous waste manifest; G OIC

Vacuums; G OIC

Water filtration equipment; G OIC

Ventilation systems; G OIC

Other equipment used to contain airborne asbestos fibers; G OIC

Chemical encapsulants sealers; G OIC

Notifications

Show compliance with ANSI Z9.2 by providing manufacturers' certifications.

SD-11 Closeout Submittals

Notifications; G OIC

Rental equipment; G OIC

Respirator program records; G OIC

Permits and licenses; G OIC

1.5 QUALITY ASSURANCE

1.5.1 Private Qualified Person Documentation

Submit the name, address, and telephone number of the Private Qualified Person (PQP) selected to prepare the Asbestos Hazard Abatement Plan, direct monitoring and training, and documented evidence that the PQP has successfully completed training in and is accredited and where required is certified as, a Building Inspector, Contractor/Supervisor Abatement Worker, and Asbestos Project Designer as described by 40 CFR 763 and has successfully completed the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent. The PQP shall be appropriately licensed in the State of South Carolina.

1.5.2 Air Sampling Results

Complete fiber counting and provide results to the PQP for review within 16 hours of the "time off" of the sample pump. Notify the Contracting Officer immediately of any airborne levels of asbestos fibers in excess of the acceptable limits. Submit sampling results to the Contracting Officer and the affected Contractor employees where required by law within 3 working days, signed by the testing laboratory employee performing air sampling, the employee that analyzed the sample, and the PQP. Notify the Contractor and the Contracting Officer immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.01 fibers per cubic centimeter or background whichever is higher. In no circumstance shall levels exceed 0.1 fibers per cubic centimeter.

1.5.3 Pressure Differential Recordings for Local Exhaust System

Provide a local exhaust system that creates a negative pressure of at least 0.51 mm 0.02 inches of water relative to the pressure external to the enclosure and operate it continuously, 24 hours a day, until the temporary enclosure of the asbestos control area is removed. Submit pressure differential recordings for each work day to the PQP for review and to the Contracting Officer within 24 hours from the end of each work day.

1.6 EQUIPMENT

1.6.1 Rental Equipment

Provide a copy of the written notification to the rental company concerning the intended use of the equipment and the possibility of asbestos contamination of the equipment.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Shall conform to current USEPA requirements, shall contain no toxic or hazardous substances as defined in 29 CFR 1926.59, and shall conform to the following performance requirements.

2.1.1 Removal Encapsulants

<u>Requirement</u>	<u>Test Standard</u>
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E 96

2.1.2 Bridging Encapsulant

<u>Requirement</u>	<u>Test Standard</u>
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E 96
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance - Minimum 245.5 mm/N 43 in/lb	ASTM D 2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522 Mandrel Bend Test

2.1.3 Penetrating Encapsulant

<u>Requirement</u>	<u>Test Standard</u>
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E 96
Cohesion/Adhesion Test - 729.5 N of force/meter 50 pounds of force/foot	ASTM E 736
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119

<u>Requirement</u>	<u>Test Standard</u>
Impact Resistance - Minimum 245.5 mm/N 43 in/lb	ASTM D 2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522 Mandrel Bend Test

2.1.4 Lock-down Encapsulant

<u>Requirement</u>	<u>Test Standard</u>
Flame Spread: 25, Smoke Emission - 50	ASTM E 84
Life Expectancy: 20 years	ASTM C 732 Accelerated Aging Test
Permeability: Minimum 0.4 perms	ASTM E 96
Fire Resistance: Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E 119
Bond Strength: 1459 N of force/meter 100 pounds of force/foot 736 (Tests compatibility with cementitious and fibrous fireproofing)	ASTM E

PART 3 EXECUTION

3.1 EQUIPMENT

3.1.1 Respirators

Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

3.1.1.1 Respirators for Handling Asbestos

Provide personnel engaged in pre-cleaning, cleanup, handling, removal of asbestos materials with respiratory protection as indicated in 29 CFR 1926.1101 and 29 CFR 1926.103.

3.1.2 Exterior Whole Body Protection

3.1.2.1 Outer Protective Clothing

Provide personnel exposed to asbestos with disposable "non-breathable," whole body outer protective clothing, head coverings, gloves, and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Make sleeves secure at the wrists, make foot coverings secure at the ankles, and make clothing secure at the neck by the use of tape.

3.1.2.2 Work Clothing

Provide cloth work clothes for wear under the outer protective clothing and foot coverings and either dispose of or properly decontaminate them as recommended by the PQP after each use.

3.1.2.3 Personal Decontamination Unit

Provide a temporary, negative pressure unit with a separate decontamination locker room and clean locker room with a shower that complies with 29 CFR 1926.51(f)(4)(ii) through (V) in between for personnel required to wear whole body protective clothing. Provide two separate lockers for each asbestos worker, one in each locker room. Keep street clothing and street shoes in the clean locker. HEPA vacuum and remove asbestos contaminated disposable protective clothing while still wearing respirators at the boundary of the asbestos work area and seal in impermeable bags or containers for disposal. Do not wear work clothing between home and work. Locate showers between the decontamination locker room and the clean locker room and require that all employees shower before changing into street clothes. Collect used shower water and filter with approved water filtration equipment to remove asbestos contamination. Dispose of filters and residue as asbestos waste. Discharge clean water to the sanitary system. Dispose of asbestos contaminated work clothing as asbestos contaminated waste. Decontamination units shall be physically attached to the asbestos control area. Build both a personnel decontamination unit and an equipment decontamination unit onto and integral with each asbestos control area.

3.1.2.4

3.1.2.5 Eye Protection

Provide goggles to personnel engaged in asbestos abatement operations when the use of a full face respirator is not required.

3.1.3 Warning Signs and Labels

Provide bilingual warning signs printed in English and Spanish at all approaches to asbestos control areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.

3.1.3.1 Warning Sign

Provide vertical format conforming to 29 CFR 1926.200, and 29 CFR 1926.1101 minimum 500 by 355 mm 20 by 14 inches displaying the following legend in the lower panel:

<u>Legend</u>	<u>Notation</u>
Danger	25 mm one inch Sans Serif Gothic or Block
Asbestos	25 mm one inch Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	6 mm 1/4 inch Sans Serif Gothic or Block

Legend

Authorized Personnel Only

Notation

6 mm 1/4 inch Gothic

Respirators and Protective
Clothing are Required in
this Area

6 mm 1/4 inch Gothic

Spacing between lines shall be at least equal to the height of the upper of any two lines.

3.1.3.2 Warning Labels

Provide labels conforming to 29 CFR 1926.1101 of sufficient size to be clearly legible, displaying the following legend:

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

BREATHING ASBESTOS DUST MAY
CAUSE SERIOUS BODILY HARM

3.1.4 Local Exhaust System

Provide a local exhaust system in the asbestos control area in accordance with ANSI Z9.2 and 29 CFR 1926.1101 that will provide at least four air changes per hour inside of the negative pressure enclosure. Local exhaust equipment shall be operated 24 hours per day, until the asbestos control area is removed and shall be leak proof to the filter and equipped with HEPA filters. Maintain a minimum pressure differential in the control area of minus 0.51 mm 0.02 inch of water column relative to adjacent, unsealed areas. Provide continuous 24-hour per day monitoring of the pressure differential with a pressure differential automatic recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control area. Filters on exhaust equipment shall conform to ANSI Z9.2 and UL 586. The local exhaust system shall terminate out of doors and remote from any public access or ventilation system intakes.

3.1.5 Tools

Vacuums shall be leak proof to the filter and equipped with HEPA filters. Filters on vacuums shall conform to ANSI Z9.2 and UL 586. Do not use power tools to remove asbestos containing materials unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation systems. Remove all residual asbestos from reusable tools prior to storage or reuse.

3.1.6 Rental Equipment

If rental equipment is to be used, furnish written notification to the rental agency concerning the intended use of the equipment and the

possibility of asbestos contamination of the equipment.

3.2 WORK PROCEDURE

Perform asbestos related work in accordance with 29 CFR 1926.1101, 40 CFR 61-SUBPART M, and as specified herein. Use wet removal procedures and techniques. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, drinking, chewing gum, tobacco, or applying cosmetics shall not be permitted in the asbestos work or control areas. Personnel of other trades not engaged in the removal of asbestos containing material shall not be exposed at any time to airborne concentrations of asbestos unless all the personnel protection and training provisions of this specification are complied with by the trade personnel. Shut down the building heating, ventilating, and air conditioning system, cap the openings to the system, prior to the commencement of asbestos work. Disconnect electrical service when wet removal is performed and provide temporary electrical service with verifiable ground fault circuit interrupter (GFCI) protection prior to the use of any water. If an asbestos fiber release or spill occurs outside of the asbestos control area, stop work immediately, correct the condition to the satisfaction of the Contracting Officer including clearance sampling, prior to resumption of work.

3.2.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent work. Where such work is damaged or contaminated as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust, or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, stop work immediately. Then clean up the spill. When satisfactory visual inspection and air sampling results are obtained from the PQP work may proceed at the discretion of the Contracting Officer.

3.2.2 Furnishings

Furniture and equipment will be removed from the area of work by the Government before asbestos work begins.

3.2.3 Precleaning

Wet wipe and HEPA vacuum all surfaces potentially contaminated with asbestos prior to establishment of an enclosure.

3.2.4 Asbestos Control Area Requirements

3.2.4.1 Negative Pressure Enclosure

Block and seal openings in areas where the release of airborne asbestos fibers can be expected. Establish an asbestos negative pressure enclosure with the use of curtains, portable partitions, or other enclosures in order to prevent the escape of asbestos fibers from the contaminated asbestos work area. Negative pressure enclosure development shall include

protective covering of uncontaminated walls, and ceilings with a continuous membrane of two layers of minimum 0.15 mm 6-mil plastic sheet sealed with tape to prevent water or other damage. Provide two layers of 0.15 mm 6-mil plastic sheet over floors and extend a minimum of 300 mm 12 inches up walls. Seal all joints with tape. Provide local exhaust system in the asbestos control area. Openings will be allowed in enclosures of asbestos control areas for personnel and equipment entry and exit, the supply and exhaust of air for the local exhaust system and the removal of properly containerized asbestos containing materials. Replace local exhaust system filters as required to maintain the efficiency of the system.

3.2.5 Removal Procedures

Wet asbestos material with a fine spray of amended water during removal, cutting, or other handling so as to reduce the emission of airborne fibers. Remove material and immediately place in 0.15 mm 6 mil plastic disposal bags. Remove asbestos containing material in a gradual manner, with continuous application of the amended water or wetting agent in such a manner that no asbestos material is disturbed prior to being adequately wetted. Where unusual circumstances prohibit the use of 0.15 mm 6 mil plastic bags, submit an alternate proposal for containment of asbestos fibers to the Contracting Officer for approval. For example, in the case where both piping and insulation are to be removed, the Contractor may elect to wet the insulation, wrap the pipes and insulation in plastic and remove the pipe by sections. Asbestos containing material shall be containerized while wet. At no time shall asbestos material be allowed to accumulate or become dry. Lower and otherwise handle asbestos containing material as indicated in 40 CFR 61-SUBPART M.

3.2.5.2 Exposed Pipe Insulation Edges

Contain edges of asbestos insulation to remain that are exposed by a removal operation. Wet and cut the rough ends true and square with sharp tools and then encapsulate the edges with a 6 mm 1/4 inch thick layer of non-asbestos containing insulating cement troweled to a smooth hard finish. When cement is dry, lag the end with a layer of non-asbestos lagging cloth, overlapping the existing ends by at least 100 mm 4 inches. When insulating cement and cloth is an impractical method of sealing a raw edge of asbestos, take appropriate steps to seal the raw edges as approved by the Contracting Officer.

3.2.7 Air Sampling

Sampling of airborne concentrations of asbestos fibers shall be performed in accordance with 29 CFR 1926.1101 and as specified herein. Sampling performed in accordance with 29 CFR 1926.1101 shall be performed by the PQP. Sampling performed for environmental and quality control reasons shall be performed by the PQP. Unless otherwise specified, use NIOSH Method 7400 for sampling and analysis. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government differ from those results obtained by the Contractor, the Government will determine which results predominate.

3.2.7.1 Sampling Prior to Asbestos Work

Provide area air sampling and establish the baseline one day prior to the masking and sealing operations for each removal site. Establish the

background by performing area sampling in similar but uncontaminated sites in the building.

3.2.7.2 Sampling During Asbestos Work

The PQP shall provide personal and area sampling as indicated in 29 CFR 1926.1101 and governing environmental regulations. In addition, provided the same type of work is being performed, provide area sampling at least once every work shift close to the work inside the enclosure, outside the clean room entrance to the enclosure, and at the exhaust opening of the local exhaust system. If sampling outside the enclosure shows airborne levels have exceeded background or 0.01 fibers per cubic centimeter, whichever is greater, stop all work, correct the condition(s) causing the increase, and notify the Contracting Officer immediately. Where alternate methods are used, perform personal and area air sampling at locations and frequencies that will accurately characterize the evolving airborne asbestos levels.

3.2.7.3 Sampling After Final Clean-Up (Clearance Sampling)

Provide area sampling of asbestos fibers using aggressive air sampling techniques as defined in the EPA 560/5-85-024 and establish an airborne asbestos concentration of less than 0.01 fibers per cubic centimeter after final clean-up but before removal of the enclosure or the asbestos work control area. After final cleanup and the asbestos control area is dry but prior to clearance sampling, the PQP shall perform a visual inspection in accordance with ASTM E 1368 to ensure that the asbestos control and work area is free of any accumulations of dirt, dust, or debris. Prepare a written report signed and dated by the PQP documenting that the asbestos control area is free of dust, dirt, and debris and all waste has been removed. The asbestos fiber counts from these samples shall be less than 0.01 fibers per cubic centimeter or be not greater than the background, whichever is greater. Should any of the final samples indicate a higher value, the Contractor shall take appropriate actions to re-clean the area and shall repeat the sampling and TEM analysis at the Contractor's expense.

3.2.8 Lock-Down

Prior to removal of plastic barriers and after pre-clearance clean up of gross contamination, the PQP shall conduct a visual inspection of all areas affected by the removal in accordance with ASTM E 1368. Inspect for any visible fibers.

3.2.9 Site Inspection

While performing asbestos engineering control work, the Contractor shall be subject to on-site inspection by the Contracting Officer who may be assisted by or represented by safety or industrial hygiene personnel. If the work is found to be in violation of this specification, the Contracting Officer or his representative will issue a stop work order to be in effect immediately and until the violation is resolved. All related costs including standby time required to resolve the violation shall be at the Contractor's expense.

3.3 CLEAN-UP AND DISPOSAL

3.3.1 Housekeeping

Essential parts of asbestos dust control are housekeeping and clean-up procedures. Maintain surfaces of the asbestos control area free of accumulations of asbestos fibers. Give meticulous attention to restricting the spread of dust and debris; keep waste from being distributed over the general area. Use HEPA filtered vacuum cleaners. DO NOT BLOW DOWN THE SPACE WITH COMPRESSED AIR. When asbestos removal is complete, all asbestos waste is removed from the work-site, and final clean-up is completed, the Contracting Officer will attest that the area is safe before the signs can be removed. After final clean-up and acceptable airborne concentrations are attained but before the HEPA unit is turned off and the enclosure removed, remove all pre-filters on the building HVAC system and provide new pre-filters. Dispose of filters as asbestos contaminated materials. Reestablish HVAC mechanical, and electrical systems in proper working order. The Contracting Officer will visually inspect all surfaces within the enclosure for residual material or accumulated dust or debris. The Contractor shall re-clean all areas showing dust or residual materials. If re-cleaning is required, air sample and establish an acceptable asbestos airborne concentration after re-cleaning. The Contracting Officer must agree that the area is safe in writing before unrestricted entry will be permitted. The Government shall have the option to perform monitoring to determine if the areas are safe before entry is permitted.

3.3.2 Title to Materials

All waste materials, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, State, and Federal regulations and herein.

3.3.3 Disposal of Asbestos

3.3.3.1 Procedure for Disposal

Collect asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 0.15 mm 6 mils thick, cartons, drums or cans). Wastes within the containers must be adequately wet in accordance with 40 CFR 61-SUBPART M. Affix a warning and Department of Transportation (DOT) label to each container including the bags or use at least 0.15 mm 6 mils thick bags with the approved warnings and DOT labeling preprinted on the bag. The name of the waste generator and the location at which the waste was generated shall be clearly indicated on the outside of each container. Prevent contamination of the transport vehicle (especially if the transport vehicle is a rented truck likely to be used in the future for non-asbestos purposes). These precautions include lining the vehicle cargo area with plastic sheeting (similar to work area enclosure) and thorough cleaning of the cargo area after transport and unloading of asbestos debris is complete. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or State-approved asbestos landfill off Government property. For temporary storage, store sealed impermeable bags in asbestos waste drums or skids. An area for interim storage of asbestos waste-containing drums or skids will be assigned by the Contracting Officer or his authorized representative. Procedure for hauling and disposal shall comply with 40 CFR 61-SUBPART M, State, regional, and local standards. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be

recycled. Workers unloading the sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

3.3.3.2 Asbestos Disposal Quantity Report

Direct the PQP to record and report, to the Contracting Officer, the amount of asbestos containing material removed and released for disposal. Deliver the report for the previous day at the beginning of each day shift with amounts of material removed during the previous day reported in linear meters or square meters linear feet or square feet as described initially in this specification and in cubic meters feet for the amount of asbestos containing material released for disposal.

-- End of Section --

SECTION 13283

REMOVAL AND DISPOSAL OF LEAD-CONTAINING PAINT

09/00

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z9.2 (1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems

ANSI Z88.2 (1992) Respiratory Protection

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1926.21 Safety Training and Education

29 CFR 1926.33 Access to Employee Exposure and Medical Records

29 CFR 1926.55 Gases, Vapors, Fumes, Dusts, and Mists

29 CFR 1926.59 Hazard Communication

29 CFR 1926.62 Lead Exposure in Construction

29 CFR 1926.65 Hazardous Waste Operations and Emergency Response

29 CFR 1926.103 Respiratory Protection

40 CFR 260 Hazardous Waste Management Systems: General

40 CFR 261 Identification and Listing of Hazardous Waste

40 CFR 262 Generators of Hazardous Waste

40 CFR 263 Transporters of Hazardous Waste

40 CFR 264 Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 265 Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 268	Land Disposal Restrictions
40 CFR 745	Lead; Requirements for Lead-Based Paint Activities
49 CFR 172	Hazardous Materials, Tables, and Hazardous Materials Communications Regulations
49 CFR 178	Shipping Container Specification

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD Guidelines	(1995) Guidelines for the Evaluation and Control of Lead Based Paint Hazards in Housing
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UNDERWRITERS LABORATORIES INC. (UL)

UL 586	(1996) High-Efficiency, Particulate, Air Filter Units
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1.2 DEFINITIONS

1.2.1 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period in an occupational/industrial environment.

1.2.2 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel.

1.2.3 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations. An industrial hygienist or safety professional certified for comprehensive practice by the American Board of Industrial Hygiene or by the Board of Certified Safety Professionals is the best choice.

1.2.4 Contaminated Room

Room for removal of contaminated personal protective equipment (PPE).

1.2.5 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.6 Eight-Hour Time Weighted Average (TWA)

Airborne concentration of lead to which an employee is exposed, averaged

over an 8 hour workday as indicated in 29 CFR 1926.62.

1.2.7 High Efficiency Particulate Air (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron or larger size particles.

1.2.8 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps.

1.2.9 Lead-Based Paint (LBP)

Paint or other surface coating that contains lead in excess of 1.0 milligrams per centimeter squared or 0.5 percent by weight.

1.2.10 Lead-Based Paint Hazard (LBP Hazard)

Any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, lead-based paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects.

1.2.11 Lead-Containing Paint (LCP)

Lead-based paint or other similar surface coating containing lead or lead compound in excess of 0.06 percent by weight of the total nonvolatile content of the paint.

1.2.12 Lead Control Area

An enclosed area or structure, constructed as a temporary containment equipped with HEPA filtered local exhaust, which prevents the spread of lead dust, paint chips, or debris existing as a condition of lead-based paint removal operations. The lead control area is also isolated by physical boundaries to prevent unauthorized entry of personnel.

1.2.13 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a work day, the PEL shall be determined by the following formula:

$$\text{PEL (micrograms/cubic meter of air)} = 400/\text{No. hrs worked per day}$$

1.2.14 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 150 to 225 mm 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.15 Physical Boundary

Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean the same as "outside lead control area but inside boundary."

1.3 DESCRIPTION OF WORK

Remove lead-based / lead-containing paint in poor condition, located on box office door and as indicated on the drawings.

1.4 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures:"

SD-03 Product Data

Vacuum filters; G OIC

Respirators; G OIC

SD-06 Test Reports

Sampling results; G OIC

Assessment data report; G OIC

SD-07 Certificates

Qualifications of CP; G OIC

Testing laboratory qualifications; G OIC

Third party consultant qualifications; G OIC

Lead-Based Paint/Lead-Containing Paint Removal Plan including CP approval (signature, date, and certification number); G OIC

Rental equipment notification; G OIC

Respiratory protection program; G OIC

Hazard communication program; G OIC

EPA approved hazardous waste treatment or disposal facility for lead disposal; G OIC

Hazardous waste management plan; G OIC

Vacuum filters; G OIC

SD-08 Manufacturer's Instructions

Chemicals and equipment; G OIC

Materials; G OIC

Material safety data sheets for all chemicals; G OIC

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility; G OIC

Certification of medical examinations; G OIC

Employee training certification; G OIC

1.5 QUALIFICATIONS OF CP

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide previous experience of the CP. Submit proper documentation that the CP is trained licensed and certified in accordance with Federal, State, and local laws.

1.7 TESTING LABORATORY

Submit the name, address, and telephone number of the testing laboratory selected to perform the air and wipe sampling, testing, and reporting of airborne concentrations of lead. Use a laboratory accredited under the EPA National Lead Laboratory Accreditation Program (NLLAP) by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis.

1.8 LEAD-BASED PAINT/LEAD-CONTAINING PAINT REMOVAL PLAN(LBP/LCPRP)

Submit a detailed job-specific plan of the work procedures to be used in the removal of LBP/LCP. The plan shall include a sketch showing the location, size, and details of lead control areas, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include in the plan, eating, drinking, smoking and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and paint debris disposal plan, air sampling plan, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that airborne lead concentrations of 30 micrograms per cubic meter of air are not reached or exceeded outside of the lead control area. Include site preparation and cleanup procedures. Include occupational and environmental sampling, training and strategy, sampling methodology, frequency, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan.

1.9 OCCUPATIONAL AND ENVIRONMENTAL SAMPLING RESULTS

Submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory responsible official, the employee that performed the sampling, and the CP.

- a. The sampling results shall represent each job classification, or

if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures in accordance with 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead.

- b. Submit worker exposure data conducted during the task based trigger operations of 29 CFR 1926.62.
- c. The initial monitoring shall determine the requirements for further monitoring and the need to fully implement the control and protective requirements including the compliance program (LBP/LCP) in accordance with 29 CFR 1926.62.

1.10 OCCUPATIONAL AND ENVIRONMENTAL ASSESSMENT DATA REPORT

Some LBP/LCP removal work may not require full implementation of the requirements of 29 CFR 1926.62. Based on the experience of the Contractor and/or the use of a specific process or method for performing the work, the Contractor may be able to provide historic data (previous 12 months) to demonstrate that airborne exposures are controlled below the action level. Such methods or controls shall be fully presented in the LBP/LCPRP. To reduce the full implementation of 29 CFR 1926.62, the Contractor shall provide documentation in an Assessment Data Report.

Submit occupational and environmental assessment report to the Contracting Officer prior to start of work, signed by the testing laboratory responsible official, and the CP.

- a. Submit a report that supports the determination regarding the reduction of the need to fully implement the requirements of 29 CFR 1926.62 and supporting the LBP/LCP. The exposure assessment shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures in accordance with 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead for stated work.
- b. Submit worker exposure data conducted during the task based trigger operations of 29 CFR 1926.62 with a complete process description in supporting a negative assessment.
- c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the compliance program (LBP/LCPRP) in accordance with 29 CFR 1926.62.

1.11 QUALITY ASSURANCE

1.11.1 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR

1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62, and 29 CFR 1926.103.

1.11.1.1 Medical Records

Maintain complete and accurate medical records of employees for a period of at least 30 years or for the duration of employment plus 30 years, whichever is longer.

1.11.1.2 Medical Surveillance

Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62.

1.11.2 Competent Person (CP) Responsibilities

- a. Certify training as meeting all federal, State, and local requirements.
- b. Review and approve lead-based paint/lead-containing paint removal plan for conformance to the applicable referenced standards.
- c. Continuously inspect lead-based paint removal work for conformance with the approved plan.
- d. Perform air and wipe sampling.
- e. Ensure work is performed in strict accordance with specifications at all times.
- f. Control work to prevent hazardous exposure to human beings and to the environment at all times.
- g. Certify the conditions of the work as called for elsewhere in this specification.

1.11.3 Training

Train each employee performing paint removal, disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State and local regulations.

1.11.3.1 Training Certification

Submit a certificate for each employee, signed and dated by the approved training source, stating that the employee has received the required lead training.

1.11.4 Respiratory Protection Program

- a. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

- b. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.11.5 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.11.6 Hazardous Waste Management

The Hazardous Waste Management Plan shall comply with applicable requirements of federal, State, and local hazardous waste regulations and address:

- a. Identification and classification of hazardous wastes associated with the work.
- b. Estimated quantities of wastes to be generated and disposed of.
- c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and operator and a 24-hour point of contact. Furnish two copies of State hazardous waste permits, manifests and EPA Identification numbers.
- d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.
- e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.
- f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.
- g. Work plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily.
- h. Unit cost for hazardous waste disposal according to this plan.

1.11.7 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of Federal, State, and local authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply.

Licensing and certification in the State of South Carolina is required.

1.11.8 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the hazardous waste management plan and the lead-based paint/lead-containing paint removal plan, including work procedures and precautions for the removal plan.

1.12 EQUIPMENT

1.12.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.12.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable, uncontaminated, protective whole body clothing, head covering, gloves, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.12.3 Rental Equipment Notification

If rental equipment is to be used during lead-based paint handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Furnish a copy of the written notification to the Contracting Officer.

1.12.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.13 REMOVAL

1.13.1 Title to Materials

Materials resulting from demolition work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of in accordance with Section 02220, "Site Demolition," except as specified herein.

PART 2 PRODUCTS

2.1 CHEMICALS

Submit applicable Material Safety Data Sheets for all chemicals used in paint removal work. Use the least toxic product approved by the Contracting Officer.

2.2 MATERIALS

The soluble metal content and the total metal content shall not exceed values which would cause a material to be classified as a hazardous waste.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Notification

Notify the Contracting Officer 10 days prior to the start of any paint removal work.

3.1.2 Lead Control Area Requirements

Establish a lead control area by situating critical barriers and physical boundaries around the area or structure where LBP/LCP removal operations will be performed.

3.1.3 Protection of Existing Work to Remain

Perform paint removal work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better.

3.1.4 Boundary Requirements

Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach 30 micrograms per cubic meter of air outside of the lead control area.

3.1.4.1 Physical Boundary

Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach 30 micrograms per cubic meter of air outside of the lead control area.

3.1.4.2 Warning Signs

Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.5 Furnishings

The Government will remove furniture and equipment from the building before lead-based paint removal work begins.

3.1.6 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 0.15 mm 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

3.1.7 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in

accordance with this specification and 29 CFR 1926.62.

3.1.8 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.9 Mechanical Ventilation System

- a. Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.62.
- b. To the extent feasible, use fixed local exhaust ventilation connected to HEPA filters or other collection systems, approved by the CP. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with ANSI Z9.2.
- c. Vent local exhaust outside the building only and away from building ventilation intakes.
- d. Use locally exhausted, power actuated, paint removal tools.

3.1.10 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.2 WORK PROCEDURES

Perform removal of lead-based paint in accordance with approved lead-based paint/lead-containing paint removal plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead-based paint is removed in accordance with 29 CFR 1926.62, except as specified herein. Dispose of removed paint chips and associated waste in compliance with Environmental Protection Agency (EPA), federal, State, and local requirements.

3.2.1 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

- a. Vacuum themselves off.
- b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.
- c. Shower.
- d. Change to clean clothes prior to leaving the physical boundary designated around the lead control area.

3.2.2 Air and Wipe Sampling

Air sample for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

- a. The CP shall be on the job site directing the air and non-clearance wipe sampling and inspecting the lead-based paint removal work to ensure that the requirements of the contract have been satisfied during the entire lead-based paint removal operation.
- b. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least 25 percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.
- c. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken. Notify the Contracting Officer immediately of exposure to lead at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area.
- d. Before any work begins, collect and analyze baseline wipe samples in accordance with methods defined in federal, State, and local standards inside and outside of the physical boundary to assess the degree of dust contamination in the facility prior to lead-based paint removal.

3.2.2.1 Air Sampling During Paint Removal Work

Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after approval is given by the CP and the Contracting Officer. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the lead control area.

3.2.3 Lead-Based Paint Removal

Manual or power sanding of interior and exterior surfaces is not permitted.

Provide methodology for removing LBP in work plan. Remove paint within the areas designated on the drawings in order to completely expose the substrate. Take whatever precautions necessary to minimize damage to the underlying substrate.

Avoid deterioration of the substrate. Provide surface preparations for painting in accord with Section 09900, "Paints and Coatings."

Provide methodology for removing LBP/LCP removal processes to minimize contamination of work areas outside the control area with lead-contaminated dust or other lead-contaminated debris/waste and to ensure that unprotected

personnel are not exposed to hazardous concentrations of lead. Describe this LBP/LCP removal process in the LBP/LCPRP.

3.2.3.1 Indoor Lead Paint Removal

Perform manual, thermal or chemical paint removal in lead control areas using enclosures, barriers, or containments. Collect residue debris for disposal in accordance with federal, State, and local requirements.

3.2.3.2 Outdoor Lead Paint Removal

Perform outdoor removal as indicated in federal, State, and local regulations and in the LBP/CPRP. The worksite preparation (barriers or containments) shall be job dependent and presented in the LBP/LCPRP.

3.2.3.3 Sampling After Paint Removal

After the visual inspection, collect air samples inside and outside the lead control area to determine the airborne levels of lead inside and outside the work area. Collect wipe samples according to the HUD protocol contained in HUD Guidelines to determine the lead content of settled dust and dirt in micrograms per square meter foot of surface area.

3.2.4 Cleanup and Disposal

3.2.4.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the CP. Reclean areas showing dust or residual paint chips or debris. After visible dust, chips and debris is removed, wet wipe and HEPA vacuum all surfaces in the work area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination before restarting work.

3.2.4.2 Clearance Certification

The CP shall certify in writing that the final air samples collected inside and outside the lead control area are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62 and 40 CFR 745; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification.

3.2.4.4 Disposal

- a. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing which may produce airborne concentrations of lead particles. Label the containers

in accordance with 29 CFR 1926.62 and 40 CFR 261. Dispose of lead-contaminated waste material at an State approved hazardous waste treatment, storage, or disposal facility off Government property.

- b. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved 208 liter 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.
- c. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.
- d. All material, whether hazardous or non-hazardous shall be disposed in accordance with laws and provisions and Federal, State, or local regulations. Ensure waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

3.2.5 Disposal Documentation

Submit written evidence that the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA and State or local regulatory agencies. Submit one copy of the completed manifest, signed and dated by the initial transporter in accordance with 40 CFR 262.

3.2.6 Payment for Hazardous Waste

Payment for disposal of hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 15050

BASIC MECHANICAL MATERIALS AND METHODS

09/99

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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C2 (1997) National Electrical Safety Code

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 117 (1997) Operating Salt Spray (Fog) Apparatus

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1 (1993; Rev. 1-4) Motors and Generators

NEMA MG 10 (1994) Energy Management Guide for Selection and Use of Fixed Frequency Medium AC Squirrel-Cage Polyphase Induction Motors

NEMA MG 11 (1977; R 1992) Energy Management Guide of Selection and Use of Single-Phase Motors

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1999) National Electrical Code

1.2 RELATED REQUIREMENTS

This section applies to all sections of Division 15, "Mechanical" of this project specification, unless specified otherwise in the individual section.

1.3 QUALITY ASSURANCE

1.3.1 Material and Equipment Qualifications

Provide materials and equipment that are standard products of manufacturers regularly engaged in the manufacture of such products, which are of a similar material, design and workmanship. Standard products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year use shall include applications of equipment and

materials under similar circumstances and of similar size. The product shall have been for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2 year period.

1.3.2 Alternative Qualifications

Products having less than a two-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturer's factory or laboratory tests, can be shown.

1.3.3 Service Support

The equipment items shall be supported by service organizations. Submit a certified list of qualified permanent service organizations for support of the equipment which includes their addresses and qualifications. These service organizations shall be reasonably convenient to the equipment installation and able to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

1.3.4 Manufacturer's Nameplate

Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.3.5 Modification of References

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction", or words of similar meaning, to mean the Contracting Officer.

1.3.5.1 Definitions

For the International Code Council (ICC) Codes referenced in the contract documents, advisory provisions shall be considered mandatory, the word "should" shall be interpreted as "shall." Reference to the "code official" shall be interpreted to mean the "Contracting Officer." For Navy owned property, references to the "owner" shall be interpreted to mean the "Contracting Officer." For leased facilities, references to the "owner" shall be interpreted to mean the "lessor." References to the "permit holder" shall be interpreted to mean the "Contractor."

1.3.5.2 Administrative Interpretations

For ICC Codes referenced in the contract documents, the provisions of Chapter 1, "Administrator," do not apply. These administrative requirements are covered by the applicable Federal Acquisition Regulations (FAR) included in this contract and by the authority granted to the Officer in Charge of Construction to administer the construction of this project. References in the ICC Codes to sections of Chapter 1, shall be applied appropriately by the Contracting Officer as authorized by his administrative cognizance and the FAR.

1.4 DELIVERY, STORAGE, AND HANDLING

Handle, store, and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations, and as approved by the Contracting Officer. Replace damaged or defective items.

1.5 SAFETY REQUIREMENTS

1.5.1 Equipment Safety

Provide positive means of locking out equipment so that equipment cannot be accidentally started during maintenance procedures. High-temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of the type specified. Ensure that access openings leading to equipment are large enough to carry through routine maintenance items such as filters and tools.

1.5.2 Warning Sign

Provide a permanent placard or sign at the entrance to confined spaces contained in the equipment. The sign shall warn personnel not to enter the space until the atmosphere inside has been tested and systems have been de-energized.

1.5.3 Lockout of Energy Sources

Provide appropriate lockout devices for energy isolating valves and for machines or other equipment to prevent unexpected start-up or release of stored electrical, mechanical, hydraulic, pneumatic, thermal, chemical, or other energy in accordance with 29 CFR 1910.147. Lockout devices for valves shall provide a means of attachment to which, or through which, a lock can be affixed or shall have a locking mechanism built into it so that the valve cannot be moved from the lockout position until the lock is removed. Electrical isolation of machines or other equipment shall be in accordance with requirements of DIVISION 16 "Electrical."

1.7 ELECTRICAL INSTALLATION REQUIREMENTS

Electrical installations shall conform to ANSI C2, NFPA 70, and requirements specified herein.

1.7.1 New Work

Provide electrical components of mechanical equipment, such as motors, motor starters, control or push-button stations, float or pressure switches, solenoid valves, integral disconnects, and other devices functioning to control mechanical equipment, as well as control wiring and conduit for circuits rated 100 volts or less, to conform with the requirements of the section covering the mechanical equipment. Extended voltage range motors shall not be permitted. The interconnecting power wiring and conduit, control wiring rated 120 volts (nominal) and conduit, and the electrical power circuits shall be provided under Division 16, except internal wiring for components of package equipment shall be provided as an integral part of the equipment. When motors and equipment

furnished are larger than sizes indicated, provide any required changes to the electrical service as may be necessary and related work as a part of the work for the section specifying that motor or equipment.

1.7.2 Modifications to Existing Systems

Where existing mechanical systems and motor-operated equipment require modifications, provide electrical components under Division 16.

1.7.3 High Efficiency Motors

1.7.3.1 High Efficiency Single-Phase Motors

Unless otherwise specified, single-phase fractional-horsepower alternating-current motors shall be high efficiency types corresponding to the applications listed in NEMA MG 11.

1.7.3.2 High Efficiency Polyphase Motors

Unless otherwise specified, polyphase motors shall be selected based on high efficiency characteristics relative to the applications as listed in NEMA MG 10. Additionally, polyphase squirrel-cage medium induction motors with continuous ratings shall meet or exceed energy efficient ratings in accordance with Table 12-6C of NEMA MG 1.

1.7.4 Three-Phase Motor Protection

Provide controllers for motors rated one hp and larger with electronic phase-voltage monitors designed to protect motors from phase-loss, undervoltage, and overvoltage. Provide protection for motors from immediate restart by a time adjustable restart relay.

1.8 INSTRUCTION TO GOVERNMENT PERSONNEL

When specified in other sections, furnish the services of competent instructors to give full instruction to the designated Government personnel in the adjustment, operation, and maintenance, including pertinent safety requirements, of the specified equipment or system. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work.

Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Government for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section. When more than 4 man-days of instruction are specified, use approximately half of the time for classroom instruction. Use other time for instruction with the equipment or system.

When significant changes or modifications in the equipment or system are made under the terms of the contract, provide additional instruction to acquaint the operating personnel with the changes or modifications.

1.9 ACCESSIBILITY

Install all work so that parts requiring periodic inspection, operation, maintenance, and repair are readily accessible. Install concealed valves,

expansion joints, controls, dampers, and equipment requiring access, in locations freely accessible through access doors.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PAINTING OF NEW EQUIPMENT

New equipment painting shall be factory applied or shop applied, and shall be as specified herein, and provided under each individual section.

3.1.1 Factory Painting Systems

Manufacturer's standard factory painting systems may be provided subject to certification that the factory painting system applied will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall withstand 500 hours in a salt-spray fog test. Salt-spray fog test shall be in accordance with ASTM B 117, and for that test the acceptance criteria shall be as follows: immediately after completion of the test, the paint shall show no signs of blistering, wrinkling, or cracking, and no loss of adhesion; and the specimen shall show no signs of rust creepage beyond 3 mm 0.125 inch on either side of the scratch mark.

The film thickness of the factory painting system applied on the equipment shall not be less than the film thickness used on the test specimen. If manufacturer's standard factory painting system is being proposed for use on surfaces subject to temperatures above 50 degrees C 120 degrees F, the factory painting system shall be designed for the temperature service.

3.1.2 Shop Painting Systems for Metal Surfaces

Clean, pretreat, prime and paint metal surfaces; except aluminum surfaces need not be painted. Apply coatings to clean dry surfaces. Clean the surfaces to remove dust, dirt, rust, oil and grease by wire brushing and solvent degreasing prior to application of paint, except metal surfaces subject to temperatures in excess of 50 degrees C 120 degrees F shall be cleaned to bare metal.

Where more than one coat of paint is specified, apply the second coat after the preceding coat is thoroughly dry. Lightly sand damaged painting and retouch before applying the succeeding coat. Color of finish coat shall be aluminum or light gray.

- a. Temperatures Less Than 50 Degrees C 120 Degrees F: Immediately after cleaning, the metal surfaces subject to temperatures less than 50 degrees C 120 degrees F shall receive one coat of pretreatment primer applied to a minimum dry film thickness of 0.0076 mm 0.3 mil, one coat of primer applied to a minimum dry film thickness of 0.0255 mm one mil; and two coats of enamel applied to a minimum dry film thickness of 0.0255 mm one mil per coat.
- b. Temperatures Between 50 and 205 Degrees C 120 and 400 Degrees F: Metal surfaces subject to temperatures between 50 and 205 degrees C

120 and 400 degrees F shall receive two coats of 205 degrees C 400 degrees F heat-resisting enamel applied to a total minimum thickness of 0.05 mm 2 mils.

- c. Temperatures Greater Than 205 Degrees C 400 Degrees F: Metal surfaces subject to temperatures greater than 205 degrees C 400 degrees F shall receive two coats of 315 degrees C 600 degrees F heat-resisting paint applied to a total minimum dry film thickness of 0.05 mm 2 mils.

-- End of Section --

SECTION 16050N

BASIC ELECTRICAL MATERIALS AND METHODS

02/03

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 FOR TESTING AND MATERIALS (ASTM)

ASTM D 709 (2001) Laminated Thermosetting Materials

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

29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE Std 100 (2000) Dictionary of Electrical and Electronics Terms (IEEE)

IEEE C2 (2002) National Electrical Safety Code (IEEE)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA C57.12.28 (1999) Pad-Mounted Equipment - Enclosure Integrity

NEMA ICS 6 (1993; R 2001) Industrial Control and Systems Enclosures

NEMA MG 1 (1998; R 2002) Motors and Generators

NEMA MG 10 (2001) Energy Management Guide for Selection and Use of Fixed Frequency Medium AC Squirrel-Cage Polyphase Induction Motors

NEMA MG 11 (1977; R 2001) Energy Management Guide for Selection and Use of Single-Phase Motors

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2002) National Electrical Code

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) / ELECTRONIC INDUSTRIES ASSOCIATION (EIA)

TIA/EIA-606-A (2002) Administration Standard for the

Telecommunications Infrastructure
(ANSI/TIA/EIA-606-A)

1.2 RELATED REQUIREMENTS

This section applies to certain sections of Division 2, "Site Construction," and Division 15, "Mechanical". This section applies to all sections of Division 16, "Electrical," of this project specification unless specified otherwise in the individual sections.

1.3 DEFINITIONS

- a. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, shall be as defined in IEEE Std 100.
- b. The technical sections referred to herein are those specification sections that describe products, installation procedures, and equipment operations and that refer to this section for detailed description of submittal types.
- c. The technical paragraphs referred to herein are those paragraphs in PART 2 - PRODUCTS and PART 3 - EXECUTION of the technical sections that describe products, systems, installation procedures, equipment, and test methods.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. 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 01330 SUBMITTAL PROCEDURES:

Submittals required in the sections which refer to this section must also conform to the following additional requirements. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and technical paragraph reference. Submittals shall also include applicable federal, military, industry, and technical society publication references, and years of satisfactory service, and other information necessary to establish contract compliance of each item to be provided. Photographs of existing installations are unacceptable and will be returned without approval. Each item requiring a submittal shall be listed separably on the submittal transmittal form and the paragraph in parts 2 or 3 of the section that describes the item shall be referenced..

1.5.1 Manufacturer's Catalog Data

Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. Handwritten and typed modifications and other notations not part of the manufacturer's preprinted data will result in the rejection of the submittal. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for certificates

of compliance.

1.5.2 Drawings

Submit drawings a minimum of 355 by 510 mm 14 by 20 inches in size using a minimum scale of one mm per 100 mm 1/8 inch per foot, except as specified otherwise. Include wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.

1.5.3 Instructions

Where installation procedures or part of the installation procedures are required to be in accordance with manufacturer's instructions, submit printed copies of those instructions prior to installation. Installation of the item shall not proceed until manufacturer's instructions are received. Failure to submit manufacturer's instructions shall be cause for rejection of the equipment or material.

1.5.4 Certificates

Submit manufacturer's certifications as required for products, materials, finishes, and equipment as specified in the technical sections. Certificates from material suppliers are not acceptable. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements to imply that the item does not meet requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; or "equal or exceed the service and performance of the specified material." Certifications shall simply state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official authorized to sign certificates of compliance.

1.5.4.1 Reference Standard Compliance

Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.

1.5.4.2 Independent Testing Organization Certificate

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. The certificate shall state 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.

1.5.5 Operation and Maintenance Manuals

Comply with the requirements of Section 01781, "Operation and Maintenance Data" and the technical sections.

1.5.5.1 Operating Instructions

Submit text of posted operating instructions for each system and principal item of equipment as specified in the technical sections.

1.6 QUALITY ASSURANCE

1.6.1 Material and Equipment Qualifications

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in the technical section.

1.6.2 Regulatory Requirements

Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70.

1.6.3 Alternative Qualifications

Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

1.6.4 Service Support

The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

1.6.5 Manufacturer's Nameplate

Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.6.6 Modification of References

In each of the publications referred to herein, consider the advisory

provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer.

1.6.7 Material and Equipment Manufacturing Date

Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.

1.7 POSTED OPERATING INSTRUCTIONS

Provide for each system and principal item of equipment as specified in the technical sections for use by operation and maintenance personnel. The operating instructions shall include the following:

- a. Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
- b. Start up, proper adjustment, operating, lubrication, and shutdown procedures.
- c. Safety precautions.
- d. The procedure in the event of equipment failure.
- e. Other items of instruction as recommended by the manufacturer of each system or item of equipment.

Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions where directed. For operating instructions exposed to the weather, provide weather-resistant materials or weatherproof enclosures. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.8 NAMEPLATES

ASTM D 709. Provide laminated plastic nameplates for each panelboard, equipment enclosure, relay, switch, and device; as specified in the technical sections or as indicated on the drawings. Each nameplate inscription shall identify the function and, when applicable, the position. Nameplates shall be melamine plastic, 3 mm 0.125 inch thick, white with black center core. Provide red laminated plastic label with white center core where indicated. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 25 by 65 mm one by 2.5 inches. Lettering shall be a minimum of 6.35 mm 0.25 inch high normal block style.

1.9 WARNING SIGNS

Provide warning signs for the enclosures of electrical equipment including substations, pad-mounted transformers, pad-mounted switches, generators, and switchgear having a nominal rating exceeding 600 volts.

- a. When the enclosure integrity of such equipment is specified to be in accordance with NEMA C57.12.28, such as for pad-mounted

transformers, provide self-adhesive warning signs on the outside of the high voltage compartment door(s). Sign shall be a decal and shall have nominal dimensions of 178 by 255 mm 7 by 10 inches with the legend "DANGER HIGH VOLTAGE" printed in two lines of nominal 50 mm 2 inch high letters. The word "DANGER" shall be in white letters on a red background and the words "HIGH VOLTAGE" shall be in black letters on a white background. Decal shall be Panduit No. PPSO710D72 or approved equal.

1.10 CABLE TAGS IN MANHOLES, HANDHOLES, AND VAULTS

Provide tags for each power and telecommunications cable or wire located in manholes, handholes, and vaults. As an example, a tag could have the following designation: "11.5 NAS 1-8(Phase A)500," denoting that the tagged cable is on the 11.5kV system circuit number NAS 1-8, underground, Phase A, sized at 500 kcmil. The labeling of telecommunications cable tags shall comply with TIA/EIA-606-A. The tags shall be polyethylene or . Do not provide handwritten letters.

1.10.1 Polyethylene Cable Tags

Provide tags of polyethylene that have an average tensile strength of 22.4 MPa 3250 pounds per square inch; and that are two millimeter 0.08 inch thick (minimum), non-corrosive non-conductive; resistive to acids, alkalis, organic solvents, and salt water; and distortion resistant to 77 degrees C 170 degrees F. Provide 1.3 mm 0.05 inch (minimum) thick black polyethylene tag holder. Provide a one-piece nylon, self-locking tie at each end of the cable tag. Ties shall have a minimum loop tensile strength of 778.75 N 175 pounds. The cable tags shall have black block letters, numbers, and symbols 25 mm one inch high on a yellow background. Letters, numbers, and symbols shall not fall off or change positions regardless of the cable tags' orientation.

1.11 ELECTRICAL REQUIREMENTS

Electrical installations shall conform to IEEE C2, NFPA 70, and requirements specified herein.

1.11.1 Motors and Equipment

Provide electrical components of mechanical equipment, such as motors, motor starters, control or push-button stations, float or pressure switches, solenoid valves, and other devices functioning to control mechanical equipment, including control wiring and conduit for circuits rated 100 volts or less, to conform with the requirements of the section covering the mechanical equipment. Extended voltage range motors shall not be permitted. The interconnecting power wiring and conduit, control wiring rated 120 volts (nominal) and conduit, and the electrical power circuits shall be provided under Division 16.

1.11.2 Wiring and Conduit

Provide internal wiring for components of packaged equipment as an integral part of the equipment. Provide power wiring and conduit for

field-installed equipment under Section 16402N, "Interior Distribution System." Power wiring and conduit shall conform to Section 16402N, "Interior Distribution System." Control wiring and conduit shall be provided under, and conform to the requirements of the section specifying the associated equipment.

1.11.3 New Work

Provide electrical components of mechanical equipment, such as motors, motor starters, control or push-button stations, float or pressure switches, solenoid valves, integral disconnects, and other devices functioning to control mechanical equipment, as well as control wiring and conduit for circuits rated 100 volts or less, to conform with the requirements of the section covering the mechanical equipment. Extended voltage range motors shall not be permitted. The interconnecting power wiring and conduit, control wiring rated 120 volts (nominal) and conduit, and the electrical power circuits shall be provided under Division 16, except internal wiring for components of packaged equipment shall be provided as an integral part of the equipment. When motors and equipment furnished are larger than sizes indicated, provide any required changes to the electrical service as may be necessary and related work as a part of the work for the section specifying that motor or equipment.

1.11.5 High Efficiency Motors

1.11.5.1 High Efficiency Single-Phase Motors

Unless otherwise specified, single-phase fractional-horsepower alternating-current motors shall be high efficiency types corresponding to the applications listed in NEMA MG 11.

1.11.5.2 High Efficiency Polyphase Motors

Unless otherwise specified, polyphase motors shall be selected based on high efficiency characteristics relative to the applications as listed in NEMA MG 10. Additionally, polyphase squirrel-cage medium induction motors with continuous ratings shall meet or exceed energy efficient ratings in accordance with Table 12-10 of NEMA MG 1.

1.12 INSTRUCTION TO GOVERNMENT PERSONNEL

Where specified in the technical sections, furnish the services of competent instructors to give full instruction to designated Government personnel in the adjustment, operation, and maintenance of the specified systems and equipment, including pertinent safety requirements as required. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Government for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section.

1.13 LOCKOUT REQUIREMENTS

Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR 1910.147. Mechanical isolation of machines and

other equipment shall be in accordance with requirements of Division 15, "Mechanical."

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PAINTING OF EQUIPMENT

3.1.1 Factory Applied

Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical sections.

3.1.2 Field Applied

Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria. Painting shall be as specified in the section specifying the associated electrical equipment.

3.2 NAMEPLATE MOUNTING

Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of two sheet-metal screws or two rivets.

3.3 WARNING SIGN MOUNTING

Provide the number of signs required to be readable from each accessible side, but space the signs a maximum of 9 meters 30 feet apart.

3.4 CABLE TAG INSTALLATION

Install cable tags in each manhole, handhole, and vault as specified, including each splice. Install cable tags over the fireproofing, if any, and locate the tags so that they are clearly visible without disturbing any cabling or wiring in the manholes, handholes, and vaults.

-- End of Section --