

DEPARTMENT OF THE NAVY  
ATLANTIC DIVISION, NAVAL FACILITIES ENGINEERING COMMAND  
MARINE CORPS AIR STATION, CHERRY POINT, NORTH CAROLINA

REPLACE STEAM PIPING BETWEEN MH-18 AND MH-38

AT THE

MARINE CORPS AIR STATION

CHERRY POINT, NORTH CAROLINA

PROJECT: WR5254883

DESIGNED BY:

FACILITIES ENGINEERING DEPARTMENT  
MCAS, CHERRY POINT, NC

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Date:

4/19/10

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DOCUMENT 00 01 15

LIST OF DRAWINGS

04/06

PART 1 GENERAL

1.1 SUMMARY

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

1.2 DFARS 252.236.7001, CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS (AUG 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall-

- (1) Check all drawings furnished immediately upon receipt;
- (2) Compare all drawings and verify the figures before laying out the work;
- (3) Promptly notify the Contracting Officer of any discrepancies;
- (4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and
- (5) Reproduce and print contract drawings and specifications as needed.

(c) In general-

- (1) Large-scale drawings shall govern small-scale drawings; and
- (2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

<PGE/>(e) The work shall conform to the specifications and the contract drawings.

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Contract drawings are as follows:

| DRAWING<br>NO. | NAVFAC<br>DWG NO. | TITLE                     |
|----------------|-------------------|---------------------------|
| G-1            | 12548278          | TITLE SHEET               |
| M-1            | 12548279          | SITE PLAN                 |
| M-2            | 12548280          | MANHOLE PLANS AND DETAILS |
| M-3            | 12548281          | DETAILS                   |

-- End of Document --

SECTION 01 11 00

SUMMARY OF WORK  
07/06

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

The work includes replacement of approximately 420 linear feet of underground steam and condensate piping, aboveground pipe insulation replacement, concrete manhole repairs and incidental related work.

1.1.2 Location

The work shall be located at the Marine Corps Air Station, Cherry Point, 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

It shall be the responsibility of the contractor to locate all existing underground utilities that are within the limits of work, prior to any excavation activities. These include but are not limited to the following buried utilities: water lines, sanitary and storm sewers, steam condensate, fuel lines, gas lines, electrical ducts and direct buried conductors, commercial telephone, Base telephone, commercial cable TV, Base instructional cable TV, EMCS and fire alarm. The contractor shall employ the services of a qualified Utility locating company to locate, identify, and mark all underground utilities. The entire construction limits shall be thoroughly scanned and researched to determine existing utility locations. Any existing utilities that are indicated on the project drawings shall be considered for reference use by the locating company and shall be verified. All underground utilities shall be clearly marked with flags, paint or stakes prior to any digging operation except that required to determine exact utility location and depth. CAUTION shall be used when trenching or excavating around or near buried utilities. The contractor shall be responsible for the timely repair and/or replacement of direct and collateral damage on any and all underground utilities that are severed, crushed, broken, displaced or otherwise disturbed by the construction operation. The Government shall not incur any additional cost for such repair or replacement. The contractor shall notify the ROICC a minimum of

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three working days prior to utility location. Do not continue with excavation or installation of new work without resolving elevation discrepancies and conflicts.

1.4 Notification Prior to Excavation

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

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

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SECTION 01 14 00

WORK RESTRICTIONS

01/08

PART 1 GENERAL

1.1 SPECIAL SCHEDULING REQUIREMENTS

- a. The surrounding facilities will remain in operation during the entire construction period. The Contractor shall conduct his operations so as to cause the least possible interference with normal operations of the activities.
  
- a. Work on the steam system shall be limited to the timeframe between 15 May and 15 October. Steam and condensate system shall be operational all other times of the year.

1.2 CONTRACTOR ACCESS AND USE OF PREMISES

1.3 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.

1.4 Working Hours

Regular working hours shall consist of an 8 1/2 hour period normally between the hours of 7:00 am to 4:30 pm, Monday through Friday, excluding Government holidays.

1.5 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.

1.6 Occupied Buildings

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

1.7 Utility Cutovers and Interruptions

- a. Permission to interrupt any Activity utility service shall be requested in writing a minimum of 15 calendar days prior to

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desired date of interruption.

- b. 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."
- c. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.
- d. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, compressed air, and steam shall be considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours."
- e. 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.

1.8 SECURITY REQUIREMENTS

1.8.1 Station Regulations

No employee or representative of the contractor will be admitted to the work site without an Identification Badge or is specifically authorized admittance to the work site by the OIC, NAVFAC Contracts.

1.8.2 Contractor Access to MCAS Cherry Point and Outlying Areas

DOCUMENTATION REQUIRED TO GRANT ACCESS TO COMMERCIAL AND CONTRACT EMPLOYEES (THIS DOCUMENT IS AN AID IN MEETING AIR STATION ORDER 5500.14B REQUIREMENTS AND IS NOT A SUBSTITUTE FOR THE ORDER)

1. Commercial and contract employees may be issued access to MCAS Cherry Point on an individual basis.
2. Commercial and contract employees must possess a picture identification card from a state or federal agency.
3. Commercial and contract employees must provide full name, social security number, date of birth, and mailing address.
4. Commercial and contract employees must provide a complete 50 state criminal records check on an annual basis. This records check may be obtained from any of the following Internet investigative services: Kroll (former Infolink Screening Services), Castle Branch, Accurate Background Investigations, Inc., or any other investigative services company that provides records checks of all 50 states. These services also validate social security card numbers. All criminal history checks must be completed no more than 30 days prior to start date of contract. (Note: These Internet screening services are listed as possible sources for obtaining a criminal background check. The United States government and the United States Marine Corps do not endorse nor are they affiliated with any of these services.)
5. Commercial and contract employees must provide proof of citizenship/immigration status. Acceptable and Naturalization Service (INS)

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forms, and passports.

6. Commercial and contract employees must provide proof of employment and a list of all their employees requiring access.

7. Commercial and contract employees must provide an approved contract and sponsorship letter from the MCAS Cherry Point employer/contracting officer identifying the following:

- a. The name of the company/business awarded the contract.
- b. Contract number (if applicable)
- c. Contract expiration/termination date
- d. Flight line access with specific location (if required)

8. In accordance with ASO 5500.14b (not an inclusive list), access will be denied if::

- a. Is on the National Terrorist Watch List
- b. Is illegally present in the United States
- c. Any reason the Installation Commander deems reasonable for the good order and discipline.
- d. Is subject to an outstanding warrant.
- e. Has knowingly submitted an employment questionnaire with false or fraudulent information.
- f. Has been issued a debarment order and is currently banned from military installations.
- g. Is a registered sex offender.
- h. Has been convicted of a felony or a drug crime within the past five years
- i. Individuals who have received a DUI/DWI in the last year will be allowed access to the installation, but will not be permitted to drive on the installation.

9. Commercial and contract employees will be issued a contractor's badge good for one year. Commercial and contract employees are required to resubmit a complete 50 state criminal records check in order to renew their badge.

10. All appeals shall be directed to the Installation Commander (Attn: Inspector's Office) for any individual that has been denied access to the installation.

Note: ID Cards issued to contractors at Camp Lejeune are valid at Cherry Point. Likewise the contractor badges issued at Cherry Point are valid at Camp Lejeune.

(\*) Social Security numbers are required on all company letters and we will be doing periodic checks through the Social Security Administration to ensure accuracy and validity. SSNs are an intricate part of the law enforcement

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identification system for personnel on board the Air Station and as required the privacy act is strictly adhered to in this regard.

(\*\*) The United States Government and the United States Marine Corps does not endorse nor are they affiliated with any of the screening services. However we must be able to verify/validate the information contained in the CRC via telephone or the clearance information may not be accepted.

PART 2 EXECUTION

Not Used

-- End of Section --

SECTION 01 20 00.00 20

PRICE AND PAYMENT PROCEDURES

07/06

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP-1110-1-8 (2003) Construction Equipment Ownership and Operating Expense Schedule, Vol 1-12

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Schedule of prices; G

1.3 SCHEDULE OF PRICES

1.3.1 Data Required

Within 15 calendar days of notice of award, prepare and deliver to the Contracting Officer a schedule of prices (construction contract). Provide a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, and extended prices therefore.

1.3.2 Schedule Instructions

Payments will not be made until the Schedule of Prices has been submitted to and accepted by the Contracting Officer. Identify the cost for site work, and include incidental work to the 5 foot line. Identify costs for the building(s), and include work out to the 5 foot line. Work out to the 5 foot line shall include construction encompassed within a theoretical line 5 feet from the face of exterior walls and shall include attendant construction, such as cooling towers, placed beyond the 5 foot line.

1.4 CONTRACT MODIFICATIONS

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

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## 1.5 CONTRACTOR'S INVOICE

### 1.5.1 Content of Invoice

Requests for payment in accordance with the terms of the contract shall consist of the following:

- a. Contractor's Invoice on NAVFAC Form 7300/30, which shall show, in summary form, the basis for arriving at the amount of the invoice.
- b. Contractor's Monthly Estimate for Voucher (LANTNAVFACECOM Form 4-4330/110 (New 7/84)), with subcontractor and supplier payment certification.
- c. Affidavit to accompany invoice (LANTDIV NORVA Form 4-4235/4 (Rev. 5/81)).
- d. Updated copy of submittal register.
- e. Updated copy of progress schedule. Furnish as specified in "FAR 52.236-15, Schedules for Construction Contracts."

### 1.5.2 Monthly Invoices and Supporting Forms

Forms will be furnished by the Contracting Officer. Requests for payment shall be processed in accordance with "FAR 52.232-5, Payments Under Fixed-Price Construction Contracts." Monthly invoices and supporting forms for work performed through the anniversary award date of the contract shall be submitted to the Contracting Officer between the 1st - 7th if contract's last digit is 0, 1, 2; 8th - 14th if contract's last digit is 3 or 4; 15th - 21st if contract's last digit is 5, 6, or 7; 22nd and last if the contract's last digit is 8th or 9th day of the month. Payments will be using Wide Area Workflow (WAWF). Submit the following documents with invoice WAWF:

- a. Contractor's invoice
- b. Contractor's monthly estimate for voucher
- c. Affidavit
- d. Updated submittal register
- e. Progress schedule
- f. Certificate of Progress Payments
- g. Contractor Safety Self Evaluation Checklist

## 1.6 PAYMENTS TO THE CONTRACTOR

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

### 1.6.1 Obligation of Government Payments

The obligation of the Government to make payments required under the

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

- a. Reasonable deductions due to defects in material or workmanship;
- b. Claims which the Government may have against the Contractor under or in connection with this contract;
- c. Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor; and
- d. Failure to provide up to date record drawings not current as stated in Contract Clause "FAC 5252.236-9310, Record Drawings."

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 30 00  
ADMINISTRATIVE REQUIREMENTS  
04/06

PART 1 GENERAL

1.1 SUBMITTALS

The following shall be submitted per Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of contact personnel

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 North Carolina State law.
- f. The Cancellation clause on the insurance certificate should read:

"Cancellation or any material change in the policies adversely affecting the interest of the Government in such insurance shall not be effective for such period as may be prescribed by the laws of the State in which this contract is to be performed and in no event less than **thirty (30)** days after written notice thereof to the Contracting Officer."

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.

1.3.2 Identification Badges

Identification badges 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.

Commercial and contract employees will be issued a contractor's badge good for one year. Commercial and contract employees are required to resubmit a complete 50 state criminal records check in order to renew their contractor's badge.

If an employee is terminated prior to end of the contract, the contractor shall return the base identification card to the Contracting Officer. This requirement also applies to all sub-contract employees.

In no event will a contractor employee be permitted access to the US Marine Corps Air Station for the purpose of on-site performance without the documentation.

### 1.3.3 Subcontractor Special Requirements

#### 1.3.3.1 Asbestos Containing Material

All contract requirements assigned to the Private Qualified Person (PQP) shall be accomplished directly by a first tier subcontractor.

#### 1.3.4 Contractor Personnel Requirements

Follow Security requirements addressed in 01 14 00 WORK RESTRICTIONS.

### 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 LEVEL "C" PARTNERING

To most effectively accomplish the contract, the Government requires the formation of a cohesive partnership with the contractor and its subcontractors. The partnering relationship is based upon trust, dedication to common goals, an understanding of each other's expectations and values, and a commitment to success. The goals of the partnering process are improved communication, efficiency and cost effectiveness, increased opportunity for innovation, and the continuous improvement of product quality. The partnership will strive to draw in 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, thereby providing the opportunity for the contractor to make a reasonable profit. This level of partnering is an introduction to partnering concepts and benefits and should become a part of the preconstruction conference. The senior ROICC and contract persons present will jointly host the initial

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session. The partners will determine the frequency of the follow-on sessions. Partnering sessions should be held at or near the location of the ROICC office.

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 contractor 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 e-mail to notify the Contractor of base access conditions when emergency conditions warrant, such as hurricanes, terrorist threats, etc. Multiple e-mail addresses will not be allowed.

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

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

04/06

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal

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."

1.1.2 Submittal Descriptions (SD)

Submittals requirements are specified in the 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 prices.
- 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, systems or equipment for some portion of the work.

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

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or

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workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

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

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

### SD-05 Design Data

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

### SD-06 Test Reports

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

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

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

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

### SD-07 Certificates

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

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

Confined space entry permits.

Text of posted operating instructions.

### SD-10 Operation and Maintenance Data

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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.

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

### SD-11 Closeout Submittals

#### 1.1.3 Approving Authority

Office or designated person authorized to approve submittal.

#### 1.1.4 Work

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

### 1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control review and certification prior to being sent to the Architect-Engineer of Record for approval, if applicable. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

#### SD-01 Preconstruction Submittals

Submittal register; G

### 1.3 USE OF SUBMITTAL REGISTER

Submittal register will be delivered to the Contractor. will have the following fields completed, to the extent that will be required by the Government during subsequent usage.

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

Column (d): Lists each submittal description (SD No. and type, e.g. SD-04 Drawings) required in each specification section.

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

Column (f): Indicate approving authority for each submittal. A "G" indicates approval by Contracting Officer; a blank indicates approval by A/E.

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved.

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### 1.3.1 Submittal Register

Submit submittal register. Submit with quality control plan and project schedule required by Section 01 45 00.00 20 CONSTRUCTION QUALITY CONTROL. 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.

### 1.3.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program. .

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.

### 1.3.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program. .

Column (b).

Column (l) List date of submittal receipt.

Column (m) through (p).

Column (q) List date returned to Contractor.

### 1.3.4 Contractor Action Code and Action Code

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

NR - Not Received

AN - Approved as noted

A - Approved

RR - Disapproved, Revise, and Resubmit

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#### 1.3.5 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.

#### 1.4 PROCEDURES FOR SUBMITTALS

##### 1.4.1 Reviewing, Certifying, Approving Authority

QC organization shall be responsible for reviewing and certifying that submittals are in compliance with contract requirements. At each "Submittal" paragraph in individual specification sections, a notation "G," following a submittal item, indicates Contracting Officer is approving authority for that submittal item. A blank indicates the Architect-Engineer of Record is the approving authority.

##### 1.4.2 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.

##### 1.4.3 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 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.

##### 1.4.4 Variations

Variations from contract requirements require Government approval pursuant to contract Clause entitled "FAR 52.236-21, Specifications and Drawings for Construction" and will be considered where advantageous to Government.

## Replace Steam Piping From MH38 to MH18

### 1.4.4.1 Considering Variations

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

### 1.4.4.2 Proposing Variations

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

### 1.4.4.3 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.

### 1.4.4.4 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.

### 1.4.5 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.

1.4.6 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 design concepts and compliance with contract documents.
- d. Act on submittals, determining appropriate action based on QC organization's review of submittal.

(1) When Architect-Engineer of Record is approving authority, forward the submittal to the A&E with the certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate.

(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. T

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

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

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

Certified by Submittal Reviewer \_\_\_\_\_, Date \_\_\_\_\_  
(Signature when applicable)

Certified by QC Manager \_\_\_\_\_, Date \_\_\_\_\_"  
(Signature)

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

## Replace Steam Piping From MH38 to MH18

- i. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

### 1.4.7 Government's Responsibilities

When approving authority is Contracting Officer or Architect-Engineer, , the approving authority 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 design 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.

### 1.4.8 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 design 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.

## 1.5 FORMAT OF SUBMITTALS

### 1.5.1 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.

Replace Steam Piping From MH38 to MH18

#### 1.5.2 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.

#### 1.5.3 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.
- e. Drawings shall include the nameplate data, size and capacity. Also include applicable federal, military, industry and technical society publication references.

#### 1.5.4 Format of SD-03 Product Data and SD-08 Manufacturer's Instruction

- 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

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satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project.

- e. Product data shall include the manufacturer's name, trade name, place of manufacture, and catalog model or number. Submittals shall also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for SD-07 Certificates.
- f. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. 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.
- g. Submit manufacturer's instruction prior to installation.

### 1.5.5 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

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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.

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

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

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

- a. Provide reports on 8 1/2 by 11 inches 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.

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

- a. O&M Data format shall comply with the requirements specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA

1.5.9 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 document.

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of Copies of SD-02 Shop Drawings

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

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

Submit in compliance with quantity requirements specified for shop drawings.

1.6.3 Number of Samples SD-04 Samples

- a. Submit one sample showing range of variation, of each required item. One approved sample or set of samples will be retained by

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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.

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

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

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

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

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

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

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

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

1.7 FORWARDING SUBMITTALS

1.7.1 Submittals Required from the Contractor

The facilities Engineering Department, MCAS Cherry Point will review and approve all technical submittals for this contract. As soon as practicable after award of contract, and before procurement of fabrication, forward to the address below submittals required in the technical sections of this specification, including shop drawings, product data and samples. Submit to the Resident Officer in Charge of Construction, NAVFAC MIDLANT, PSC Box 8006, Cherry Point, North Carolina 28533-0006. Also submit to the Resident Officer in Charge of Construction, NAVFAC MIDLANT Contracts, at the above address, for review and approval, the following:.

All submittals required by Division 01 - General Requirements.  
All Submittals with "G" designations.

1.7.1.1 O&M Data

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

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

#### 1.8 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

#### 1.9 Government Approved

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

#### 1.10 Information Only

All submittals not requiring Government or Architect-Engineer of Record approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

#### 1.10.1 APPROVED SUBMITTALS

The Contracting Officer's and Architect-Engineer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the approving authority, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

#### 1.10.1.1 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

#### 1.11 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

#### 1.12 GENERAL

The contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient details to allow ready determination of compliance with contract requirements. Prior to

## Replace Steam Piping From MH38 to MH18

submittal, all items shall be checked and approved by the contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test report; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

### 1.13 SUBMITTAL REGISTER

At the end of this section is a submittal register showing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Government will provide the initial submittal register. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall track all submittals.

### 1.14 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 14 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

### 1.15 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each time submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

### 1.16 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

#### 1.16.1 Procedures

The Government will further discuss detailed submittal procedures with the contractor at the Preconstruction Conference.

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1.16.1.1 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.17 CONTROL OF SUBMITTALS

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

1.18 GOVERNMENT AND ARCHITECT-ENGINEER

Upon completion of review of submittals requiring Government approval, the submittal will be identified as having received approval by being so stamped and dated. One copy of the submittal will be retained by the Architect-Engineer, three copies will be retained by the Contracting Officer and three copies will be returned to the Contractor.

1.19 INFORMATION ONLY

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

1.20 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

|   |
|---|
| CONTRACTOR<br><br>(Firm Name)   |
| _____ Approved  |
| _____ Approved with corrections as noted on submittal data and/or attached sheets(s). |
| SIGNATURE: _____  |

Replace Steam Piping From MH38 to MH18

|        |       |
|--------|-------|
| TITLE: | _____ |
| DATE:  | _____ |

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

# SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

Replace Steam Piping From MH38 to MH18

CONTRACTOR

| ACTIVITY NO | TRANSMITTAL NO | SPEC SECT      | DESCRIPTION<br>ITEM SUBMITTED               | PARAGRAPH | GOVT CLASSIFICATION REVIEW | CONTRACTOR: SCHEDULE DATES |                    |                    | CONTRACTOR ACTION |                | APPROVING AUTHORITY               |                            |                            |             |                | REMARKS |   |
|-------------|----------------|----------------|---|-----------|----------------------------|----------------------------|--------------------|--------------------|-------------------|----------------|-----------------------------------|----------------------------|----------------------------|-------------|----------------|---------|---|
|             |                |                |   |           |                            | SUBMIT                     | APPROVAL NEEDED BY | MATERIAL NEEDED BY | ACTION CODE       | DATE OF ACTION | DATE FWD TO APPR AUTH/ FROM CONTR | DATE FWD TO OTHER REVIEWER | DATE RCD FROM OTH REVIEWER | ACTION CODE | DATE OF ACTION |         | MAILED TO CONTR/ DATE RCD FRM APPR AUTH |
|             |                |                |   |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                | 01 20 00.00 20 | SD-01 Preconstruction Submittals            |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Schedule of prices                          | 1.3       | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                | 01 30 00       | SD-01 Preconstruction Submittals            |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | List of contact personnel                   | 1.3.1     |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                | 01 33 00       | SD-01 Preconstruction Submittals            |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Submittal register                          | 1.3.1     | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                | 01 35 29       | SD-01 Preconstruction Submittals            |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Accident Prevention Plan (APP)              | 1.7       | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Activity Hazard Analysis (AHA)              | 1.8       | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Crane Critical Lift Plan                    | 1.7.1     | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Crane Operators                             | 1.6.1.3   | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | SD-06 Test Reports                          |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Reports                                     | 1.12      |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Accident Reports                            | 1.12.1    |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Monthly Exposure Reports                    | 1.12.3    |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Crane Reports                               | 1.12.4    |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Regulatory Citations and Violations         |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | SD-07 Certificates                          |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Confined Space Entry Permit                 | 1.9       |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Hot work permit                             | 1.9       |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Contractor Safety Self-Evaluation Checklist | 1.4       | G A                        |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |                | Certificate of Compliance                   | 1.12.5    |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                | 01 45 00.00 20 | SD-01 Preconstruction Submittals            |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |

# SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

Replace Steam Piping From MH38 to MH18

CONTRACTOR

| ACTIVITY NO | TRANSMITTAL NO | SPEC SECT      | DESCRIPTION<br>ITEM SUBMITTED                            | PARAGRAPH | GOVT CLASSIFICATION REVIEW | CONTRACTOR: SCHEDULE DATES |                    |                    | CONTRACTOR ACTION |                | APPROVING AUTHORITY               |                            |                            |             |                | REMARKS |   |     |
|-------------|----------------|----------------|--|-----------|----------------------------|----------------------------|--------------------|--------------------|-------------------|----------------|-----------------------------------|----------------------------|----------------------------|-------------|----------------|---------|---|-----|
|             |                |                |  |           |                            | SUBMIT                     | APPROVAL NEEDED BY | MATERIAL NEEDED BY | ACTION CODE       | DATE OF ACTION | DATE FWD TO APPR AUTH/ FROM CONTR | DATE FWD TO OTHER REVIEWER | DATE RCD FROM OTH REVIEWER | ACTION CODE | DATE OF ACTION |         | MAILED TO CONTR/ DATE RCD FRM APPR AUTH |     |
|             |                |                |  |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   | (g) |
|             |                | 01 45 00.00 20 | Construction Quality Control (QC) Plan                   | 1.6.1     | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                | 01 50 00.00 20 | SD-01 Preconstruction Submittals                         |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Traffic control plan                                     | 1.6       | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                | 01 57 19.00 20 | SD-01 Preconstruction Submittals                         |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Preconstruction Survey                                   | 1.5.1     | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Solid Waste Management Plan and Permit                   | 3.4       | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Regulatory Notification                                  | 1.5.2     | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Environmental Protection Plan                            | 3.1       | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Construction Dewatering Plan                             |           | G                          |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | SD-06 Test Reports                                       |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Laboratory Analysis                                      | 3.5.2     |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Disposal Requirements                                    | 3.15.2    |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Erosion and Sediment Control                             | 3.2.2     |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Inspection Reports                                       |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Storm Water Inspection Reports for General Permit        |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | SD-11 Closeout Submittals                                |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Waste Determination                                      | 3.5       |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Documentation  |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Disposal Documentation for Hazardous and Regulated Waste | 3.6.1     |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Contractor 40 CFR Employee                               | 1.5.4     |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Training Records   |           |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Solid Waste Management Report                            | 3.4.1     |                            |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |

# SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

Replace Steam Piping From MH38 to MH18

CONTRACTOR

| ACTIVITY NO | TRANSMITTAL NO | SPEC SECT      | DESCRIPTION<br>ITEM SUBMITTED               | PARAGRAPH | GOVT OR CLASSIFICATION REVIEW | CONTRACTOR: SCHEDULE DATES |                    |                    | CONTRACTOR ACTION |                | APPROVING AUTHORITY               |                            |                            |             |                | REMARKS |   |     |
|-------------|----------------|----------------|---|-----------|-------------------------------|----------------------------|--------------------|--------------------|-------------------|----------------|-----------------------------------|----------------------------|----------------------------|-------------|----------------|---------|---|-----|
|             |                |                |   |           |                               | SUBMIT                     | APPROVAL NEEDED BY | MATERIAL NEEDED BY | ACTION CODE       | DATE OF ACTION | DATE FWD TO APPR AUTH/ FROM CONTR | DATE FWD TO OTHER REVIEWER | DATE RCD FROM OTH REVIEWER | ACTION CODE | DATE OF ACTION |         | MAILED TO CONTR/ DATE RCD FRM APPR AUTH |     |
|             |                |                |   |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   | (a) |
|             |                | 01 57 19.00 20 | Contractor Hazardous Material Inventory Log | 3.5.1     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Contractor Hazardous Material Inventory Log | 3.6       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Hazardous Waste/Debris Management           | 3.13.1    |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                | 01 77 00.00 20 | SD-10 Operation and Maintenance Data        |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Equipment/Product Warranty List             | 1.4.1     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | SD-11 Closeout Submittals                   |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | As-Built Drawings                           | 1.3.1     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Record Of Materials                         | 1.3.2     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Equipment/Product Warranty Tag              | 1.4.2     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Monthly Project Waste Summary Report        |           | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Hazardous Material Reporting                |           | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Certification of EPA Designated Items       | 1.2       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                | 02 41 00       | SD-07 Certificates                          |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Demolition plan                             | 1.9       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Notifications                               | 1.4.1     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                | 02 50 00       | SD-03 Product Data                          |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Pavement                                    | 1.4       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Tack coat                                   | 2.1       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | Stone                                       | 2.5.2     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |                | SD-05 Design Data                           |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |

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| TITLE AND LOCATION<br>Replace Steam Piping From MH38 to MH18 |                |                |                                  |           |                               | CONTRACTOR                    |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|--|----------------|----------------|----------------------------------|-----------|-------------------------------|-------------------------------|--------------------------|--------------------------|----------------------|----------------------|---|----------------------------------|----------------------------------|----------------|----------------------|--|---------|
| ACTIVITY NO  | TRANSMITTAL NO | SPEC SECT      | DESCRIPTION<br>ITEM SUBMITTED    | PARAGRAPH | GOVT OR CLASSIFICATION REVIEW | CONTRACTOR:<br>SCHEDULE DATES |                          |                          | CONTRACTOR<br>ACTION |                      | APPROVING AUTHORITY                                       |                                  |                                  |                |                      | MAILED TO CONTR/<br>DATE RCD FRM APPR AUTH | REMARKS |
|  |                |                |                                  |           |                               | SUBMIT                        | APPROVAL<br>NEEDED<br>BY | MATERIAL<br>NEEDED<br>BY | ACTION<br>CODE       | DATE<br>OF<br>ACTION | DATE FWD<br>TO APPR<br>AUTH/<br>DATE RCD<br>FROM<br>CONTR | DATE FWD<br>TO OTHER<br>REVIEWER | DATE RCD<br>FROM OTH<br>REVIEWER | ACTION<br>CODE | DATE<br>OF<br>ACTION |  |         |
| (a)  | (b)            | (c)            | (d)                              | (e)       | (f)                           | (g)                           | (h)                      | (i)                      | (j)                  | (k)                  | (l)   | (m)                              | (n)                              | (o)            | (p)                  | (q)  | (r)     |
|  |                | 02 50 00       | Job-mix formula                  | 1.2.1     | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                | 03 30 00.00 20 | SD-03 Product Data               |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Materials for curing concrete    | 2.4.6     | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Epoxy bonding compound           | 2.4.7     | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | SD-05 Design Data                |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | mix design                       | 2.3.1     | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | SD-06 Test Reports               |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Concrete mix design              | 1.6.1.1   | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Compressive strength tests       | 3.7.2.3   |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Air Content                      | 3.7.2.4   |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                | 31 23 00.00 20 | SD-01 Preconstruction Submittals |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Shoring and Sheeting Plan        | 1.7.1     | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Dewatering work plan             | 1.7.2     | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | SD-06 Test Reports               |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Borrow Site Testing              | 1.6       | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Fill and backfill                | 3.9.2.1   | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Density tests                    | 3.9.2.2   | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Moisture Content Tests           | 3.9.2.3   | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                | 32 92 23       | SD-03 Product Data               |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Fertilizer                       | 2.3       |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | SD-06 Test Reports               |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Topsoil composition tests        | 2.2.3     |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | SD-07 Certificates               |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | sods                             | 2.1       |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                | 33 60 01       | SD-02 Shop Drawings              |           |                               |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |
|  |                |                | Detail Drawings                  | 1.3.1     | G                             |                               |                          |                          |                      |                      |   |                                  |                                  |                |                      |  |         |

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|             |                |           |   |           |                               | SUBMIT                     | APPROVAL NEEDED BY | MATERIAL NEEDED BY | ACTION CODE       | DATE OF ACTION | DATE FWD TO APPR AUTH/ FROM CONTR | DATE FWD TO OTHER REVIEWER | DATE RCD FROM OTH REVIEWER | ACTION CODE | DATE OF ACTION |         | MAILED TO CONTR/ DATE RCD FRM APPR AUTH |
|             |                |           |   |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                | 33 60 01  | SD-03 Product Data                            |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Piping and Fittings                           | 2.4       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Valves  | 2.5       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Insulation                                    | 2.8.2     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | SD-04 Samples                                 |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Insulated Sections                            | 1.3.2     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | SD-10 Operation and Maintenance Data          |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Valve Manholes and Accessories                | 3.5       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Data Package 2                                | 3.5.1     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                | 33 63 13  | SD-02 Shop Drawings                           |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Heat Distribution System design               | 1.4.3     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | SD-03 Product Data                            |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Pipe  | 2.3.1     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Insulation                                    | 2.2       | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Fittings                                      | 2.3.2     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Anchors                                       | 1.3.3     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Coatings                                      | 1.2.7     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Conduit                                       | 2.1.6     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Field Connection of Casing Sections           | 2.1.12    | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | SD-05 Design Data                             |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Pipe-stress and system expansion calculations | 1.2.6     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |
|             |                |           | Cathodic protection system calculations       |           | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |

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|             |                |           |                                      |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   | (a) |
|             |                | 33 63 13  | Manufacturer's data sheets           | 1.2.7     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | SD-07 Certificates                   |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | Work plan                            | 1.2.8     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | Quality assurance                    | 1.2.9     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | UHDS manufacturer certification      | 1.2.4     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | UHDS design                          | 1.3.2     | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | Certificate of compliance            | 1.2.10    | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | Testing firm qualification           | 1.2.11    | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | Welds                                | 1.2.12    | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | SD-10 Operation and Maintenance Data |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | Heat distribution system             | 1.2.14    | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | SD-11 Closeout Submittals            |           |                               |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |
|             |                |           | Daily written report                 | 1.2.13    | G                             |                            |                    |                    |                   |                |                                   |                            |                            |             |                |         |   |     |

SECTION 01 35 29

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

04/06

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- |                  |  |
|------------------|--|
| ANSI A10.32      | Personal Fall Protection - Safety Requirements for Construction and Demolition Operations      |
| ANSI Z359.1      | (1992; R 1999) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components |
| ANSI/ASSE A10.34 | (2001) Protection of the Public on or Adjacent to Construction Sites                           |

ASME INTERNATIONAL (ASME)

- |             |  |
|-------------|--|
| ASME B30.22 | (2005) Articulating Boom Cranes              |
| ASME B30.3  | (1996) Construction Tower Cranes             |
| ASME B30.5  | (2004) Mobile and Locomotive Cranes          |
| ASME B30.8  | (2004) Floating Cranes and Floating Derricks |

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- |          |   |
|----------|---|
| NFPA 10  | (2002) Portable Fire Extinguishers                                      |
| NFPA 241 | (2004) Safeguarding Construction, Alteration, and Demolition Operations |
| NFPA 51B | (2003) Fire Prevention During Welding, Cutting, and Other Hot Work      |
| NFPA 70  | (2005) National Electrical Code   |
| NFPA 70E | (2004) Electrical Safety in the Workplace                               |

U.S. ARMY CORPS OF ENGINEERS (USACE)

- |            |   |
|------------|---|
| EM 385-1-1 | (2003) Safety -- Safety and Health Requirements |
|------------|---|

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

|                 |   |
|-----------------|---|
| 29 CFR 1910     | Occupational Safety and Health Standards  |
| 29 CFR 1910.146 | Permit-required Confined Spaces   |
| 29 CFR 1915     | Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment |
| 29 CFR 1926     | Safety and Health Regulations for Construction                                      |
| 29 CFR 1926.500 | Fall Protection   |

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

- Accident Prevention Plan (APP); G
- Activity Hazard Analysis (AHA); G
- Crane Critical Lift Plan; G
- Proof of qualification for Crane Operators; 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
- Crane Reports
- Regulatory Citations and Violations

SD-07 Certificates

- Confined Space Entry Permit
- Hot work permit
- Contractor Safety Self-Evaluation Checklist; G, A
- Certificate of Compliance (Crane)

Submit one copy of each permit/certificate attached to each Daily Production Report.

1.3 DEFINITIONS

a. Competent Person for Fall Protection. A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.

b. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

c. 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.

d. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers and crane walkers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

e. Qualified Person for Fall Protection. A person with a recognized degree or professional certificate, and with extensive knowledge, training and experience in the field of fall protection; who is capable of performing design, analysis, and evaluation of fall protection systems and equipment.

f. 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 (any time lost after day of injury/illness onset);

(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.

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

h. 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/or collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking,

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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 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

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

### 1.5 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. 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.

### 1.6 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 Contractor Quality Control (QC) person can be the SSHO on this project. The SSHO shall meet the following requirements:

##### Level 1:

- Worked on similar projects.
- 10-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 for confined space meeting the definition and requirements of EM 385-1-1.

##### 1.6.1.3 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, crane operators shall be designated as qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Proof of current qualification shall be provided.

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### 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 production 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. 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 Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
- b. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer'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.
- c. 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.

d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

#### 1.6.3.2 Safety Meetings

Shall be conducted and documented as required by EM 385-1-1. Minutes showing contract title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily production report.

#### 1.7 ACCIDENT PREVENTION PLAN (APP)

The Contractor shall use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CIH.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSSO and quality control manager. Should any hazard become evident, stop work in the area, secure the area, and develop a plan to remove the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, all necessary action shall be taken to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ANSI/ASSE A10.34,) and the environment.

Copies of the accepted plan will be maintained at the Contracting Officer's office and at the job site.

The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they

are discovered.

1.7.1 EM 385-1-1 Contents

In addition to the requirements outlines in Appendix A of USACE EM 385-1-1, the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be used such as CSPs, CIHs, STSS, CHSTs. The duties of each position shall be specified.

b. Qualifications of competent and of qualified persons. As a minimum, competent persons shall be designated and qualifications submitted for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with 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. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. The plan shall be submitted 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.C.18. and the following:

(1) For lifts of personnel, the plan shall demonstrate compliance with the requirements of 29 CFR 1926.550(g).

(2) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. The amount of list and trim shall be within the crane manufacturer's requirements.

e. 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 for fall protection shall prepare and sign the plan. The plan shall include fall protection and prevention systems, equipment and methods employed

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for every phase of work, responsibilities, assisted rescue, self-rescue and evacuation procedures, 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. The Fall Protection and Prevention Plan shall be included in the Accident Prevention Plan (APP).

f. Site Demolition Plan. The safety and health aspects prepared in accordance with Section 02 41 00 DEMOLITION and referenced sources.

g. Excavation Plan. The safety and health aspects prepared in accordance with Section 31 00 00 EARTHWORK.

### 1.8 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 AHAs as amendments to the APP. 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.

The activity hazard analyses shall be developed using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

### 1.9 DISPLAY OF SAFETY INFORMATION

Within 1 calendar days after commencement of work, erect a safety bulletin board at the job site. The safety bulletin board shall include information and be maintained as required by EM 385-1-1, section 01.A.06. Additional items required to be posted include:

- a. Confined space entry permit.
- b. Hot work permit.

### 1.10 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.

### 1.11 EMERGENCY MEDICAL TREATMENT

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

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### 1.12 REPORTS

#### 1.12.1 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 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

b. For any weight handling equipment accident (including rigging gear accidents) the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Crane operations shall not proceed until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. The Contracting Officer will provide a blank copy of the accident report form.

#### 1.12.2 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. 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.

#### 1.12.3 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.

#### 1.12.4 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.

#### 1.12.5 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

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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.

### 1.13 HOT WORK

Prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark 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. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 30 minutes after completion of the task or as specified on the hot work permit.

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 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).

### 2.2 FALL PROTECTION ANCHORAGE

Fall protection anchorage, conforming to ANSI Z359.1, installed under the supervision of a qualified person in fall protection, shall be left in place for continued customer use and so identified by signage stating the capacity of the anchorage (strength and number of persons who may be tied-off to it at any one time).

## 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, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard shall prevail.

#### 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.

### 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 USACE 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 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 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 PROGRAM

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 evacuation 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. A competent person for fall protection shall provide the training. Training requirements shall be in accordance with USACE EM 385-1-1, section 21.A.16.

### 3.3.2 Fall Protection Equipment and Systems

The Contractor shall enforce use of the fall protection equipment and systems designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is exposed to a fall hazard. Employees shall be protected from fall hazards as specified in EM 385-1-1, section 21. 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.H. and 05.I. 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 are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel. Fall protection must comply with 29 CFR 1926.500, Subpart M, USACE EM 385-1-1 and ANSI A10.32.

#### 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 body support 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 and any swinging of the worker (pendulum-like motion) that can occur during a fall 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-Sloped Roofs: Work on steep-sloped roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

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### 3.3.4 Existing Anchorage

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

### 3.3.5 Horizontal Lifelines

Horizontal lifelines shall be designed, installed, certified and used under the supervision of a qualified person for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 ( 29 CFR 1926.500).

### 3.3.6 Guardrails and Safety Nets

Guardrails and safety nets shall be designed, installed and used in accordance with EM 385-1-1 and 29 CFR 1926 Subpart M.

### 3.3.7 Rescue and Evacuation Procedures

When personal fall arrest systems are used, the contractor must ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. A Rescue and Evacuation Plan shall be prepared by the contractor and include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. The Rescue and Evacuation Plan shall be included in the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP).

## 3.4 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.

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3.5 EQUIPMENT

3.5.1 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.

3.5.2 Weight Handling Equipment

- a. Cranes and derricks shall be equipped as specified in EM 385-1-1, section 16.
- 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. Prior to cranes entering federal activities, a Crane Access Permit must be obtained from the Contracting Officer. A copy of the permitting process will be provided at the Preconstruction Conference. Contractor's operator 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, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.
- e. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.
- f. 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.
- g. 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.
- h. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.

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- i. All employees shall be kept clear of loads about to be lifted and of suspended loads.
- j. The Contractor shall use cribbing when performing lifts on outriggers.
- k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.
- l. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.
- m. 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.
- n. 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.
- o. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).
- p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. Prior to conducting lifting operations the contractor shall set a maximum wind speed at which a crane can be safely operated based on the equipment being used, the load being lifted, experience of operators and riggers, and hazards on the work site. This maximum wind speed determination shall be included as part of the activity hazard analysis plan for that operation.

### 3.5.3 Equipment and Mechanized Equipment

- a. Proof of qualifications for operator 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.

### 3.6 EXCAVATIONS

The competent person shall perform soil classification in accordance with 29 CFR 1926.

#### 3.6.1 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.

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### 3.6.2 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 0.061 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.

### 3.6.3 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.

### 3.6.4 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.

## 3.7 UTILITIES WITHIN CONCRETE SLABS

Utilities located within concrete slabs or pier structures, bridges, and the like, are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever contract work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be coordinated with station utility departments in addition to a private locating service. Outages to isolate utility systems shall be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

## 3.8 ELECTRICAL

### 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

## Replace Steam Piping From MH38 to MH18

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. In addition, provide electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA.

### 3.8.2 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, OSHA 29 CFR 1910.146 and OSHA 29 CFR 1926.21(b)(6). 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.06 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. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

-- End of Section --

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CONSTRUCTION QUALITY CONTROL

07/06

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2003) Safety -- Safety and Health Requirements

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Quality Control (QC) Plan; G

Submit a Construction QC Plan within 20 calendar days after receipt of Notice of Award.

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.

1.3 INFORMATION FOR THE CONTRACTING OFFICER

At the Preconstruction Conference, the Contractor can obtain a single copy set of the current report forms from the Contracting Officer. The report forms will consist of the Contractor Production Report, Contractor Production Report (Continuation Sheet), Contractor Quality Control Report, Contractor Quality Control Report (Continuation Sheet), Preparatory Phase Checklist, Initial Phase Checklist, Rework Items List, and Testing Plan and Log, Other reports referenced below may be in formats customarily used by the Contractor, Testing laboratories, etc. and will contain the information required by this specification.

Deliver the following to the Contracting Officer during Construction:

- a. Combined Contractor Production Report/Contractor Quality Control Report; original and 1 copy by 10:00AM the next working day after each day that work is performed.
- b. Preparatory Phase Checklist: Original attached to the original Contractor Quality Control Report and 1 copy attached to each copy.
- c. Initial Phase Checklist: Original attached to the original Contractor Quality Control Report and 1 copy attached to each copy.
- d. Field Test Reports: 2 copies, with 2 working days after the test

is performed, attached to the Contractor Quality Control Report.

- e. Monthly Summary Report of Tests: 2 copies attached to the Contractor Quality Control Report.
- f. Testing Plan and Log: 2 copies at the end of each month.
- g. Rework Items List: 2 copies, by the last working day of the month.
- h. CQC Meeting Minutes: 2 copies, within 2 working days after the meeting.
- i. QC Certifications: As required by the paragraph entitled "QC Certifications."

#### 1.4 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. This QC program is a key element in meeting the objectives of NAVFAC Commissioning. The QC program consists of a QC Organization, QC Plan, QC Plan Meeting(s), a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, 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 QC Manager is the primary individual responsible for quality control, all individuals will be held responsible for the quality of work on the job.

##### 1.4.1 Acceptance of the Construction Quality Control (QC) Plan

Acceptance of the QC Plan is required prior to the start of construction. The Contracting Officer reserves the right to require changes in the QC Plan and operations as necessary, including removal of personnel, to ensure the specified quality of work. The Contracting Officer reserves the right to interview any member of the QC organization at any time in order to verify the submitted qualifications. All QC organization personnel 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.

##### 1.4.2 Preliminary Construction Work Authorized Prior to Acceptance

The only construction work that is authorized to proceed prior to the acceptance of the QC Plan is mobilization of storage and office trailers, temporary utilities, and surveying.

###### 1.4.2.1 Approval

Approval of the QC Plan is required prior to the start of construction. The contracting Officer reserves the right to require changes in the QC Plan and operations as necessary, including removal of personnel, to ensure the specified quality of work. The Contracting Officer reserves the right to interview any member of the QC organization at any time in order to

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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.

### 1.4.3 Notification of Changes

Notify the Contracting Officer, in writing, of any proposed changes in the QC Plan or changes to the QC organization personnel, a minimum of 7 work 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. In addition to implementing and managing the QC program, the QC Manager may perform the duties of Project Superintendent and Site Safety Officer. The QC Manager shall not be designated as the safety competent person as defined by EM 385-1-1. The QC Manager is required to attend the partnering meetings, QC Plan Meetings, Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control, 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 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 10 years combined experience in the following positions: Project Superintendent, QC Manager, Project Manager, Project Engineer or Construction Manager on similar size and type construction contracts which included the major trades that are part of this Contract. The individual shall have at least two years experience as a QC Manager. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification, safety compliance, and sustainability.

### 1.5.2 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager shall have completed the course entitled "Construction Quality Management (CQM) 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 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

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calendar year. The qualification requirements for the Alternate QC Manager shall be the same as for the QC Manager.

## 1.6 QUALITY CONTROL (QC) PLAN

### 1.6.1 Construction Quality Control (QC) Plan

#### 1.6.1.1 Requirements

Provide, for acceptance by the Contracting Officer, a Construction QC Plan submitted in a three-ring binder that includes a table of contents, with major sections identified with tabs, with pages numbered sequentially that covers both on-site and off-site work and includes the following:

I. QC ORGANIZATION: A chart showing the QC organizational structure.

II. NAMES AND QUALIFICATIONS: Names and qualifications, in resume format, for each person in the QC organization. Include the CQM for Contractors course certifications for the QC Manager and Alternate QC Manager as required by the paragraphs entitled "Construction Quality Management Training" and "Alternate QC Manager Duties and Qualifications".

III. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONNEL: Duties, responsibilities, and authorities of each person in the QC organization.

IV. OUTSIDE ORGANIZATIONS: A listing of outside organizations, such as architectural and consulting engineering firms, that will be employed by the Contractor and a description of the services these firms will provide.

V. APPOINTMENT LETTERS: Letters signed by an officer of the firm appointing the QC Manager and Alternate QC Manager and stating that they are responsible for implementing and managing the QC program as described in this Contract. Include in this letter the responsibility of the QC Manager and Alternate QC Manager to implement and manage the three phases of control, and their authority to stop work which is not in compliance with the Contract. The QC Manager shall issue letters of direction to all other QC Specialists outlining their duties, authorities, and responsibilities. Copies of the letters shall be included in the QC Plan.

VI. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER: Procedures for reviewing, approving, and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval. Provide the initial submittal of the Submittal Register as specified in section 01 33 00 SUBMITTAL PROCEDURES.

VII. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraphs entitled "Accreditation Requirements", as applicable.

VIII. TESTING PLAN AND LOG: A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test.

IX. PROCEDURES TO COMPLETE REWORK ITEMS: Procedures to identify,

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record, track, and complete rework items. Use Government forms to record and track rework items.

X. DOCUMENTATION PROCEDURES: Use Government form.

XI. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task that is separate and distinct from other tasks and has control requirements and work crews unique to that task, has the same control requirements and work crews.. A DFOW is identified by different trades or disciplines and is an item or activity on the construction schedule. The list of DFOWs shall include, but not be limited to, all critical path activities on the NAS. Include all activities for which this specification requires. Each design development stage and submittal package shall have separate DFOWs in the Network Analysis Schedule.

XII. PROCEDURES FOR PERFORMING THE THREE PHASES OF CONTROL: Identify procedures you will use to ensure the three phases of control are used to manage the quality on this project. For each DFOW, a Preparatory and Initial phase checklist will be filled out during the Preparatory and Initial phase meetings. 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 DFOW.

XIII. PERSONNEL MATRIX: A personnel matrix showing for each section of the specification who will review and approve submittals, who will perform and document the three phases of control, and who will perform and document the testing.

XIV. PROCEDURES FOR COMPLETION INSPECTION: Procedures for identifying and documenting the completion inspection process. Include in these procedures the responsible party for punch out inspection, pre-final inspection, and final acceptance inspection.

XV. ORGANIZATION AND PERSONNEL CERTIFICATIONS LOG: Procedures for coordinating, tracking and documenting all certifications on subcontractors, testing laboratories, suppliers, personnel, etc. QC Manager will ensure that certifications are current, appropriate for the work being performed, and will not lapse during any period of the contract that the work is being performed.

### 1.7 QC PLAN MEETINGS

Prior to submission of the QC Plan, the QC Manager will meet with the Contracting Officer to discuss the QC Plan requirements of this Contract. The purpose of this meeting is to develop a mutual understanding of the QC Plan requirements prior to plan development and submission and to agree on the Contractor's list of DFOWs.

### 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. When a new QC Manager is appointed, the coordination and mutual understanding meeting shall be repeated.

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### 1.8.1 Purpose

The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, , coordination of activities to be performed, and the coordination of the Contractor's management, production, and QC personnel. At the meeting, the Contractor will be required to explain in detail how three phases of control will be implemented for each DFOW, as well as how each DFOW will be affected by each management plan or requirement as listed below:

### 1.8.2 Coordination of Activities

Activities included in various sections shall be coordinated to assure efficient and orderly installation of each component. Coordinate operations included under different sections that are dependent on each other for proper installation and operation. Schedule construction operations with consideration for indoor air quality as specified in the IAQ Management Plan. Coordinate prefunctional tests and startup testing with Cx.

### 1.8.3 Attendees

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. The Contractor shall provide a copy of the signed minutes to all attendees.

## 1.9 QC MEETINGS

After the start of construction, the QC Manager shall conduct weekly QC meetings at the work site with the Project Superintendent and the foremen who are performing the work of the DFOWs. The QC Manager shall prepare the minutes of the meeting and provide a copy to the Contracting Officer within two working days after the meeting. The Contracting Officer may attend these meetings. As a minimum, 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 and rework;
- c. Review the status of submittals;
- d. Review the work to be accomplished in the next two weeks and documentation required;
- e. Resolve QC and production problems (RFI, etc.);
- f. Address items that may require revising the QC Plan;
- g. Review Accident Prevention Plan (APP);
- h. Review environmental requirements and procedures;
- i. Review Waste Management Plan;

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### 1.10 DESIGN REVIEW AND DOCUMENTATION

### 1.11 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 DFOW.

#### 1.11.1 Preparatory Phase

Notify the Contracting Officer at least two work days in advance of each preparatory phase meeting. The meeting shall be conducted by the QC Manager and attended by the Project Superintendent, and the foreman responsible for the DFOW. When the DFOW will be accomplished by a subcontractor, that subcontractor's foreman shall attend the preparatory phase meeting. Document the results of the preparatory phase actions in the daily Contractor Quality Control Report and in the Preparatory Phase Checklist. Perform the following prior to beginning work on each DFOW:

- a. Review each paragraph of the applicable specification sections;
- b. Review the Contract drawings;
- c. Verify that field measurements are as indicated on construction and/or shop drawings before confirming product orders, in order to minimize waste due to excessive materials;
- d. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- e. Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- f. Examine the work area to ensure that the required preliminary work has been completed;
- g. Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials;
- h. Arrange for the return of shipping/packaging materials, such as wood pallets, where economically feasible;
- i. 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;
- j. 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 DFOW;
- k. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted; and

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### 1.11.2 Initial Phase

Notify the Contracting Officer at least two work days in advance of each initial phase. When construction crews are ready to start work on a DFOW, conduct the initial phase with the Project Superintendent, and the foreman responsible for that DFOW. Observe the initial segment of the DFOW to ensure that the work complies with Contract requirements. Document the results of the initial phase in the daily CQC Report and in the Initial Phase Checklist. Repeat the initial phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each DFOW:

- a. Establish 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 APP and the appropriate AHA to ensure that applicable safety requirements are met; and

### 1.11.3 Follow-Up Phase

Perform the following for on-going work daily, or more frequently as necessary, until the completion of each DFOW and document in the daily CQC Report:

- a. Ensure the work is in compliance with Contract requirements;
- b. Maintain the quality of workmanship required;
- c. Ensure that testing is performed by the approved laboratory;
- d. Ensure that rework items are being corrected;
- e. Perform safety inspections; and

### 1.11.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same DFOW if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if work on a DFOW is resumed after substantial period of inactivity, or if other problems develop.

### 1.11.5 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.

## 1.12 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review and approval of submittals are described in Section 01 33 00 SUBMITTAL PROCEDURES.

## 1.13 TESTING

Except as stated otherwise in the specification sections, perform sampling

and testing required under this Contract.

#### 1.13.1 Accreditation Requirements

Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation. The laboratory's scope of accreditation must include the appropriate ASTM standards (E 329, C 1077, D 3666, D 3740, A 880, E 543) listed in the technical sections of the specifications. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the Corporate Office.

#### 1.13.2 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology at <http://ts.nist.gov/ts/htdocs/210/214/214.htm> , the American Association of State Highway and Transportation Officials (AASHTO) program at <http://www.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.a2la.org/>, the Washington Association of Building Officials (WABO) at <http://www.wabo.org/> (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL) at <http://www.wacel.org/labaccred.html> (Approval authority by WACEL is limited to projects within Facilities Engineering Command (FEC) Washington geographical area).

#### 1.13.3 Capability Check

The Contracting Officer retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in this Contract.

#### 1.13.4 Test Results

Cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the Contracting Officer immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results 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, per the paragraph entitled "INFORMATION FOR THE CONTRACTING OFFICER".

#### 1.13.5 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

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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.

### 1.14 QC CERTIFICATIONS

#### 1.14.1 CQC Report Certification

Each CQC 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."

#### 1.14.2 Invoice Certification

Furnish a certificate to the Contracting Officer with each payment request, signed by the QC Manager, attesting that as-built drawings are current, coordinated and attesting that the work for which payment is requested, including stored material, is in compliance with Contract requirements.

#### 1.14.3 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."

### 1.15 COMPLETION INSPECTIONS

#### 1.15.1 Punch-Out Inspection

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

#### 1.15.2 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 Client can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in a 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.

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### 1.15.3 Final Acceptance Inspection

The Contractor shall notify the Contracting Officer at least 14 calendar days prior to the date a final acceptance inspection can be held. The notice shall state that all items previously identified on the pre-final punch list will be corrected and acceptable, along with any other unfinished Contract work, by the date of the final acceptance inspection. The Contractor shall be represented by the QC Manager, the Project Superintendent, the CA, and others deemed necessary. Attendees for the Government will include the Contracting Officer, other ROICC personnel, and personnel representing the Client. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract Clause entitled "Inspection of Construction."

### 1.16 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities.

#### 1.16.1 Construction Documentation

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. Maintain current and complete records of on-site and off-site QC program operations and activities. The forms identified under the paragraph "INFORMATION FOR THE CONTRACTING OFFICER" shall be used. Reports are required for each day work is performed. Account for each calendar day throughout the life of the Contract. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The Project Superintendent and the QC Manager must prepare and sign the Contractor Production and CQC Reports, respectively. The reporting of work shall be identified by terminology consistent with the construction schedule. In the "remarks" sections of the reports, enter pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site, quality control problem areas, deviations from the QC Plan, construction deficiencies encountered, meetings held. For each entry in the report(s), identify the Schedule Activity No. that is associated with the entered remark.

#### 1.16.2 Quality Control Validation

Establish and maintain the following in a series of three ring binders. Binders shall be divided and tabbed as shown below. These binders shall be readily available to the Contracting Officer during all business hours.

- a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.
- b. All milestone inspections, arranged by Activity Number.
- c. An up-to-date copy of the Testing Plan and Log with supporting field test reports, arranged by specification section.
- d. Copies of all contract modifications, arranged in numerical order.

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Also include documentation that modified work was accomplished.

e. An up-to-date copy of the Rework Items List.

f. Maintain up-to-date copies of all punch lists issued by the QC staff to the Contractor and Sub-Contractors and all punch lists issued by the Government.

#### 1.16.3 Testing Plan and Log

As tests are performed, the QC Manager shall record on the "Testing Plan and Log" the date the test was performed and the date the test results were forwarded to the Contracting Officer. Attach a copy of the updated "Testing Plan and Log" to the last daily CQC Report of each month.

#### 1.16.4 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. Attach a copy of the "Rework Items List" to the last daily CQC Report of each month. The Contractor shall be responsible for including those items identified by the Contracting Officer.

#### 1.16.5 As-Built Drawings

The QC Manager is required to ensure the as-built drawings, required by Section 01 77 00.00 20 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 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.

#### 1.17 NOTIFICATION ON NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected non-compliance with the Contract. 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.

### PART 2 PRODUCTS

Not used.

### PART 3 EXECUTION

#### 3.1 PREPARATION

Designate receiving/storage areas for incoming material to be delivered

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according to installation schedule and to be placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. Store and handle materials in a manner as to prevent loss from weather and other damage. Keep materials, products, and accessories covered and off the ground, and store in a dry, secure area. Prevent contact with material that may cause corrosion, discoloration, or staining. Protect all materials and installations from damage by the activities of other trades.

-- End of Section --

SECTION 01 50 00.00 20

TEMPORARY FACILITIES AND CONTROLS

04/06

PART 1 GENERAL

1.1 REFERENCES

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

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241 (2004) Safeguarding Construction, Alteration, and Demolition Operations

NFPA 70 (2005) National Electrical Code

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

FHWA SA-89-006 (1988) Manual on Uniform Traffic Control Devices for Streets and Highways

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Traffic control plan; G

1.3 Contractor Utilities

The Contractor shall provide his own utilities.

1.4 Utilities at Special Locations

Reasonable amounts of utilities will be made available to the Contractor at the prevailing Government rates. These rates may be obtained upon application to the Commanding Officer, by way of the Contracting Officer. The Contractor will be responsible for making connections, providing transformers and meters, (THE CONTRACTOR MUST CERTIFY THAT ALL TRANSFORMERS INSTALLED ARE TEMPORARY POWER DURING THIS CONTRACT ARE PCB FREE), and making disconnections; and for providing backflow preventer devices on connections to domestic water lines. Under no circumstances will taps to base fire hydrants be allowed for obtaining domestic water. Neither potable water nor sanitary facilities will be available at the main Contractor laydown area at Marine Corps Air Station (MCAS), Cherry Point, NC.

1.5 WEATHER PROTECTION

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions

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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.

### 1.5.1 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.

#### 1.5.1.1 Hurricane Condition of Readiness

Unless directed otherwise, comply with:

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

### 1.6 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

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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. Make all notifications and obtain any permits required for modification to traffic movements outside Station's jurisdiction. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

### 1.7 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. Obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system. Any penalties and / or fines associated with improper discharge shall be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Include provisions for pest control and elimination of odors.

### 1.8 TEMPORARY BUILDINGS

Trailers or storage buildings will be permitted, where space is available, subject to the approval of the Contracting Officer. The trailers or buildings shall be in good condition, free from visible damage rust and deterioration, and meet all applicable safety requirements. Trailers shall be roadworthy and comply with all appropriate state and local vehicle requirements. Failure to maintain storage trailers or buildings to these standards shall result in the removal of non-complying units at the Contractor's expense. A sign not smaller than 24 x 24 inches shall be conspicuously placed on the trailer depicting the company name, business phone number, and emergency phone number. Trailers shall be anchored to resist high winds and must meet applicable state and local standards for anchoring mobile trailers. A laydown site will be provided as indicated for trailers, storage buildings, and/or bulk storage within five miles of the construction site. All trailers or storage buildings shall be suitably painted, kept in a good state of repairs, and clearly identified with the Contractor's name and telephone number. All laydown sites, staging areas, and construction sites shall be kept free of debris and trash, fences properly maintained, and all vegetation trimmed. Failure of the Contractor to maintain his trailers or storage buildings in good condition will be considered sufficient reason to require their removal from the job site. Trailers shall be anchored to resist high winds and must meet applicable state or local standards for anchoring mobile trailers.

#### 1.8.1 Maintenance of Temporary Facilities

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

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### PART 2 PRODUCTS

### 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 for each road segment and isolated area of work to prevent access by unauthorized people (special emphasis shall be placed on preventing access by children). Fencing shall be a four feet high orange plastic grid supported at intervals sufficient to resist at least 250 pounds of force applied against the fence. Fencing shall be moved as work progresses. Place fencing on the side opposite the street side of the walkway to allow adequate work space for the Contractor's activities.

###### 3.1.1.3 Signs

Place warning signs at the construction area perimeter designating the presence of construction hazards requiring unauthorized persons to keep out. Signs must be placed on all sides of the project, with at least one sign every 300 feet. All points of entry 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 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.

#### 3.3 GRASS CUTTING

Cut grass (or annual weeds) within construction and storage sites to a maximum 4 inch height at least once a week during the growing season unless the grass area is not visible to the public. Trim the grass around fences at time of grass cutting. Maintain grass or weeds on stockpiled earth as described above.

-- End of Section --

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TEMPORARY ENVIRONMENTAL CONTROLS

07/06

PART 1 GENERAL

1.1 REFERENCES

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

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

|                 |   |
|-----------------|---|
| 29 CFR 1910.120 | Hazardous Waste Operations and Emergency Response   |
| 40 CFR 112      | Oil Pollution Prevention  |
| 40 CFR 241      | Guidelines for Disposal of Solid Waste  |
| 40 CFR 243      | Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste                   |
| 40 CFR 258      | Subtitle D Landfill Requirements  |
| 40 CFR 261      | Identification and Listing of Hazardous Waste   |
| 40 CFR 262      | Standards Applicable to Generators of Hazardous Waste   |
| 40 CFR 263      | Standards Applicable to Transporters of Hazardous Waste   |
| 40 CFR 264      | Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities                     |
| 40 CFR 265      | Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities      |
| 40 CFR 266      | Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities |
| 40 CFR 268      | Land Disposal Restrictions  |
| 40 CFR 279      | Standards for the Management of Used Oil  |
| 40 CFR 300      | National Oil and Hazardous Substances Pollution Contingency Plan  |
| 40 CFR 355      | Emergency Planning and Notification   |

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|                      |   |
|----------------------|---|
| 40 CFR 372-SUBPART D | Specific Toxic Chemical Listings                            |
| 49 CFR 173           | Shippers - General Requirements for Shipments and Packaging |
| 49 CFR 178           | Specifications for Packaging                                |

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material, including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations. Types of solid waste typically generated at construction sites may include:

- a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.
- b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.
- c. Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.
- d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.
- e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.
- f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.

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- g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may be included as recyclable if sold to a scrap metal company. Paint cans may be included as recyclable if sold to a scrap metal company.
- h. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this document.

Material not regulated as solid waste are: nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

### 1.2.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

### 1.2.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

### 1.2.5 Garbage

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

### 1.2.6 Hazardous Waste (Including Universal Hazardous Waste)

Hazardous Wastes are defined by the Resource Conservation and Recovery Act (RCRA - Subtitle C) as wastes which first meet the definition of "solid" wastes and are then further defined in 40CFR Parts 261.21, 261.22, 261.23, 261.24, 261.31, 261.32, 261.33(e), and 261.33(f) with regard to their hazardous waste properties and / or characteristics (to include U.S. EPA's lists of Hazardous Wastes. These regulations cover a wide range of process and product generated wastes, and discarded (including materials intended to be discarded) or unusable materials in solid, liquid, and gaseous forms.

Universal (Hazardous) Wastes are a subset of Hazardous Waste, and are defined in 40CFR Part 273.2, 273.3, 273.4, and 273.5 and include batteries, pesticides, mercury containing equipment, and lamps.

Contractors must be intimately familiar with the above-detailed Hazardous Waste regulations to ensure compliance with section 1.4.1.

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### 1.2.7 Hazardous Materials

Hazardous material is any material that:

- a. Is regulated as a hazardous material per 49 CFR 173, or
- b. Requires a Material Safety Data Sheet (MSDS) per 29 CFR 1910.120, or
- c. During end use, treatment, handling, packaging, storage, transpiration, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D.

Designation of a material by this definition, when separately regulated or controlled by other instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this instruction for "control" purposes. Such material include ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs). Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

### 1.2.8 Waste Hazardous Material and Substances

Waste hazardous materials and substances are those materials which do not meet any of the regulatory definitions of either Hazardous Waste or Universal (Hazardous) Waste, but which still may pose a threat to human health or the environment or cause significant legal liabilities under CERCLA if not properly managed. In general, such materials may be defined as those which pose a threat to human health and / or the environment due to their quantity, concentration, or their physical, chemical, or infectious characteristics and which have been so designated by federal, state, or local agencies.

### 1.2.9 Used Oil and Oily Wastes

Used Oil is defined in 40CFR Part 279 to include a wide variety of oils and fuels and how they must be properly managed to ensure proper disposal, reclamation, and / or recycling. Animal and vegetable oils do not fall under this regulatory classification. Grease does not fall under this regulatory classification

Those materials which are, or were, mixed with used oil and have become separated from that used oil. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, used oil and may be appropriately tested and discarded in a manner which is in compliance with other State and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that:

- a. It is not prohibited in other State regulations or local ordinances

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- b. The amount generated is "de minimus" (a small amount)
- c. It is the result of minor leaks or spills resulting from normal process operations
- d. All free-flowing oil has been removed to the practical extent possible

Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, a hazardous waste determination must be performed prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.10 Regulated Waste

Those solid waste that have specific additional Federal, state, or local controls for handling, storage, or disposal.

1.2.11 Class I Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act and includes the following chemicals:

|                                  |                                  |
|----------------------------------|----------------------------------|
| chlorofluorocarbon-11 (CFC-11)   | chlorofluorocarbon-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                       |
| chlorofluorocarbon-114 (CFC-114) | halon-1301                       |
| chlorofluorocarbon-115 (CFC-115) | halon-2402                       |
| chlorofluorocarbon-211 (CFC-211) | carbon tetrachloride             |
| chlorofluorocarbon-212 (CFC-212) | methyl chloroform                |

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

- Preconstruction Survey; G
- Solid Waste Management Plan and Permit; G
- Regulatory Notification; G
- Environmental Protection Plan; G
- Construction Dewatering Plan; G

SD-06 Test Reports

- Laboratory Analysis
- Disposal Requirements

Erosion and Sediment Control Inspection Reports

Storm Water Inspection Reports for General Permit

SD-11 Closeout Submittals

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the binder corresponding to each of the applicable sub items listed below.

Waste Determination Documentation

Disposal Documentation for Hazardous and Regulated Waste

Contractor 40 CFR Employee Training Records

Solid Waste Management Report

Contractor Hazardous Material Inventory Log; G

Hazardous Waste/Debris Management

#### 1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

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

Marine Corps Air Station, Cherry Point is listed on the National Priorities List pursuant to the Comprehensive Environmental Response, Compensation and Liabilities Act 42 USCA, Section 9601 et seq. as amended April 15, 1996 (CERCLA). Bogue Field, Oakgrove, BT-11 and Atlantic Field are not listed on the National Priorities List. The Contractor shall immediately bring to the Contracting Officer's attention any unanticipated site condition which may involve hazardous materials or hazardous waste and the Contractor shall not disturb such conditions without the Contracting Officer's prior written documentation as to whether such conditions are outside the contract requirements.

##### 1.4.1 Facility Hazardous Waste Generator Status

Marine Corps Air Station Cherry Point is designated as a Large Quantity Generator (LQG) of Hazardous Waste, a Large Quantity Handler of Universal (Hazardous) Waste, and maintains a Treatment, Storage, and Disposal facility. Accordingly, MCAS Cherry Point is required to actively maintain and comply with a RCRA Part "B" operating permit issued by the State of North Carolina. All work conducted within the boundaries of this activity must be in compliance with the Part B permit, and the generator's various designations and operational requirements. Contractors will comply with all federal, state, and local regulatory requirements governing the proper

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training of personnel, and proper identification, generation, management, storage, handling, manifesting, transportation, and disposal of any Hazardous Waste(s) which they may cause to be generated in the course of the execution of their contract(s).

### 1.5 QUALITY ASSURANCE

#### 1.5.1 Preconstruction Survey

Perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record.

#### 1.5.2 Regulatory Notification

The Contractor is responsible for all Regulatory Notification requirements in accordance with Federal, State and local regulations. In cases where the Navy must also provide public notification (such as stormwater permitting), the Contractor must coordinate with the Contracting Officer. The Contractor shall submit copies of all regulatory notifications to the Contracting Officer prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition, renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

#### 1.5.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the activity; types and quantities of wastes/wastewater that may be generated during the contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and activity environmental staff to discuss the proposed Environmental Protection Plan. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, required permits, permit requirements, and other measures to be taken.

#### 1.5.4 Contractor 40 CFR Employee Training Records

Prepare and maintain employee training records throughout the term of the contract meeting applicable 40 CFR requirements. Submit these training records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.1 ENVIRONMENTAL PROTECTION PLAN

Prior to initiating any work on site, the Contractor will meet with the Contracting Officer to discuss the proposed Environmental Protection Plan and develop a mutual understanding relative to the details of environmental

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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:

- a. Description of the Environmental Protection Plan
  - (1) General overview and purpose
  - (2) General site information
- 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
  - (1) Ground cover
  - (2) Erodible soils
  - (3) Temporary measures
    - (a) Mechanical retardation and control of runoff
    - (b) Vegetation and mulch
- e. Protection of the Environment from Waste Derived from Contractor Operations
  - (1) Control and disposal of solid and sanitary waste
  - (2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

This item will consist of the management procedures for all hazardous waste to be generated. The elements of those procedures will coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Contracting Officer. As a minimum, include the following:

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- (a) Procedures to be employed to ensure a written waste determination is made for appropriate wastes which are to be generated;
- (b) Sampling/analysis plan;
- (c) Methods of hazardous waste accumulation/storage (i.e., in tanks and/or containers);
- (d) Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted);
- (e) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268);
- (f) Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and the like;
- (g) Used oil management procedures in accordance with 40 CFR 279;
- (h) Pollution prevention\hazardous waste minimization procedures;
- (i) Plans for the disposal of hazardous waste by permitted facilities;
- (j) Procedures to be employed to ensure all required employee training records are maintained.

f. Prevention of Releases to the Environment

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

g. Regulatory Notification and Permits

- (1) List what notifications and permit applications must be made. Include copies of all applicable, environmental permits.

3.1.1 Environmental Protection Plan Review

Fourteen days after the environmental protection 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.

3.1.2 Facility Hazardous Waste Generator Status

Cherry Point 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.

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### 3.1.3 Licenses and Permits

Obtain licenses and permits pursuant to the "Permits and Responsibilities" FAR Clause.

For permits obtained by the Contracting Officer, whether or not required by the permit, the Contractor is responsible for conforming to all permit requirements and performing all quality control inspections of the work in progress, and to submit notifications and certifications to the applicable regulatory agency via the Contracting Officer.

No permits will be obtained by the Contracting Officer.

Where required by the State regulatory authority, the inspections and certifications will be provided through the services of a Professional Engineer (PE), registered in the State where the work is being performed. Where a PE is not required, the individual must be otherwise qualified by other current State licensure, specific training and prior experience (minimum 5 years). As a part of the quality control plan, which is required to be submitted for approval by the quality control section, provide a sub item containing the name, appropriate professional registration or licence number, address, and telephone number of the professionals or other qualified persons who will be performing the inspections and certifications for each permit.

#### 3.1.3.1 Construction Dewatering Plan

Dewatering using well points is considered a well contractor activity, and must be performed or personally supervised by a North Carolina Certified Well Driller. Construction and abandonment must be performed per 15A NCAC 2C, Titled 15A, Subchapter 2C. Well construction and abandonment records are required, and the original copies shall be submitted to the Contracting Officer for review and submittal to the state. Submittal must also include the name(s) of NC Certified Well Driller and a copy of their certification.

### 3.2 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.

Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as indicated or specified.

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor will be responsible for any resultant damage.

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees

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with 30 percent or more of their root systems destroyed. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Contracting Officer's approval before replacement.

The Contracting Officer's approval is required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition or as indicated.

### 3.2.1 Erosion and Sediment Control Measures

#### 3.2.1.1 Burnoff

Burnoff of the ground cover is not permitted.

#### 3.2.1.2 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.

#### 3.2.1.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

##### a. Mechanical Retardation and Control of Runoff

(1) Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, berms, and use of silt fences and straw bales to retard and divert runoff to protected drainage courses.

##### b. Sediment Basins

(1) Trap sediment in temporary sediment basins. Select a basin size to accommodate the runoff of a local 50-year storm. Pump dry and remove the accumulated sediment, after each storm. Use a paved weir or vertical overflow pipe for overflow. Remove collected sediment from the site. Institute effluent quality monitoring programs.

(2) Install, inspect, and maintain best management practices (BMPs) as required by the general permit. Prepare BMP Inspection Reports as required by the general permit. If required by the permit, include those inspection reports.

##### c. Vegetation and Mulch

(1) Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective

erosion control.

(2) Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish a suitable stand of grass. The seeding operation will be as specified in Section 32 92 23 Sodding.

### 3.2.2 Erosion, Sediment and Stormwater Control

Submit "Erosion and Sediment Control Inspection Reports" (E&S) (form 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 0.5 inch or more of rain.

Submit "Erosion and Sediment Control Reports" (E&S) (form provided at the pre-construction conference) and "Stormwater Inspections for General Permit NCG010000 - Land Disturbing Activities" (form provided at [http://h2o.enr.state.nc.us/su/PDF\\_Files/SW\\_General\\_Permits/NCG01\\_Inspect\\_log.pdf](http://h2o.enr.state.nc.us/su/PDF_Files/SW_General_Permits/NCG01_Inspect_log.pdf)) to the Contracting Officer once every 7 days and within 24 hours of a storm event that produces 0.5 inch or more of rain.

Comply with NCG010000, North Carolina Permit to Discharge Storm Water under the National Pollutant Discharge Elimination System. The existing permit may be obtained from:

[http://h2o.enr.state.nc.us/su/PDF\\_Files/SW\\_General\\_Permits/NCG01\\_Inspect\\_log.pdf](http://h2o.enr.state.nc.us/su/PDF_Files/SW_General_Permits/NCG01_Inspect_log.pdf).

### 3.3 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Carefully protect in-place and report immediately to the Contracting Officer historical and archaeological items or human skeletal remains discovered in the course of work. Upon discovery, notify the Contracting Officer. Stop work in the immediate area of the discovery until directed by the Contracting Officer to resume work. The Government retains ownership and control over historical and archaeological resources.

### 3.4 SOLID WASTE MANAGEMENT PLAN and PERMIT

Provide to the contracting officer written notification of the quantity of solid waste/debris that is anticipated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance or as applicable, submit one copy of a State and local permit or license showing such agencies' approval of the disposal plan before transporting wastes off Government property.

#### 3.4.1 Solid Waste management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste. Include copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, the Contractor may submit a statement indicating the disposal location for the solid waste which is signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification will 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 will submit on the solid waste

## Replace Steam Piping From MH38 to MH18

disposal report the information previously described in this paragraph. Prices paid or received will not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

### 3.4.2 Control and Disposal of Solid Wastes

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the Contracting Officer and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, State, and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

### 3.5 WASTE DETERMINATION DOCUMENTATION

Complete a Waste Determination form (provided at the pre-construction conference) for all contractor derived wastes to be generated. Base the waste determination upon either a constituent listing from the manufacturer used in conjunction with consideration of the process by which the waste was generated, EPA approved analytical data, or laboratory analysis (Material Safety Data Sheets (MSDS) by themselves are not adequate). Attach all support documentation to the Waste Determination form. As a minimum, a Waste Determination form must be provided for the following wastes (this listing is not all inclusive): oil and latex based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and all containers of the original materials.

#### 3.5.1 Contractor Hazardous Material Inventory Log

Submit the Contractor Hazardous Material Inventory Log (found at: <http://www.wbdg.org/ccb/NAVGRAPH/01575n.pdf>), which provides information required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS) to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

#### 3.5.2 Laboratory Analysis

Submit a copy of a Laboratory Analysis of solid waste and debris with the potential of becoming classified as a hazardous waste (i.e., abrasive/sand blasting debris, etc.). Waste stream determinations are required at the point of generation and must sufficiently document whether the waste will be a solid waste, hazardous waste, or Resource Conservation and Recovery Act (RCRA) exempt waste. Determinations must use EPA approved methods and provide written rationale for whether the waste is classified as hazardous or non-hazardous. The Contractor will bear the cost of the waste stream determinations, and the Contracting Officer reserves the right to request waste stream determinations on questionable waste streams.

### 3.6 CONTRACTOR HAZARDOUS MATERIAL INVENTORY LOG

Submit the "Contractor Hazardous Material Inventory Log" (found at:

<http://www.lantdiv.navy.mil/pls/lantdiv/docs/FOLDER/EICO/UFGS/GRAPHICS/01575.pdf>), which provides information required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS) to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

### 3.6.1 Disposal Documentation for Hazardous and Regulated Waste

Manifest, pack, ship and dispose of hazardous or toxic waste and universal waste that is generated as a result of construction in accordance with the generating facilities generator status under the Resource Conservation and Recovery Act. Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and State permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifest must be reviewed, signed, and approved by the Navy before the Contractor may ship waste. To obtain specific disposal instructions the Contractor must coordinate with the Activity environmental office.

### 3.7 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

minimize the use of hazardous materials and the generation of hazardous waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the Environmental Protection Plan. Consult with the activity Environmental Office for suggestions and to obtain a copy of the installation's pollution prevention/hazardous waste minimization plan for reference material when preparing this part of the plan. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the types of the hazardous materials expected to be used in the construction when requesting information.

### 3.8 WHM/HW MATERIALS PROHIBITION

No waste hazardous material or hazardous waste shall be disposed of on government property. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract. The government is not responsible for disposal of Contractor's waste material brought on the job site and not required in the performance of this contract. The intent of this provision is to dispose of that waste identified as waste hazardous material/hazardous waste as defined herein that was generated as part of this contract and existed within the boundary of the Contract limits and not brought in from offsite by the Contractor. Incidental materials used to support the contract including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive. The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or to the river or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

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### 3.9 HAZARDOUS MATERIAL CONTROL

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Submit a MSDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on base. Typical materials requiring MSDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. At the end of the project, provide the Contracting Officer with the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used. Ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Keep copies of the MSDS for hazardous materials on site at all times and provide them to the Contracting Officer at the end of the project. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

### 3.10 PETROLEUM PRODUCTS

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while on-site exhibits a characteristic of hazardous waste. Used oil containing 1000 parts per million of solvents will be considered a hazardous waste and disposed of at Contractor's expense. Used oil mixed with a hazardous waste will also be considered a hazardous waste.

#### 3.10.1 Oily and Hazardous Substances

Prevent oil or hazardous substances from entering the ground, drainage areas, or navigable waters. In accordance with 40 CFR 112, surround all temporary fuel oil or petroleum storage tanks with a temporary berm or containment of sufficient size and strength to contain the contents of the tanks, plus 10 percent freeboard for precipitation. The berm will be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs.

### 3.11 FUEL TANKS

Petroleum products and lubricants required to sustain up to 30 days of construction activity may be kept on site. Storage and refilling practices shall comply with 40 CFR Part 112. Secondary containment shall be provided and be no less than 110 percent of the tank volume plus five inches of free-board. If a secondary berm is used for containment then the berm shall be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Drips pans are required and the tanks must be covered during inclement weather.

### 3.12 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage,

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regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Base or Activity Fire Department, the activity's Command Duty Officer, and the Contracting Officer. If the contractor's response is inadequate, the Navy may respond. If this should occur, the contractor will be required to reimburse the government for spill response assistance and analysis.

The Contractor is responsible for verbal and written notifications as required by the federal 40 CFR 355, State, local regulations and Navy Instructions. Spill response will be in accordance with 40 CFR 300 and applicable State and local regulations. Contain and clean up these spills without cost to the Government. If Government assistance is requested or required, the Contractor will reimburse the Government for such assistance. Provide copies of the written notification and documentation that a verbal notification was made within 20 days.

Maintain spill cleanup equipment and materials at the work site. Clean up all hazardous and non-hazardous (WHM) waste spills. The Contractor shall reimburse the government for all material, equipment, and clothing generated during any spill cleanup. The Contractor shall reimburse the government for all costs incurred including sample analysis materials, equipment, and labor if the government must initiate its own spill cleanup procedures, for Contractor responsible spills, when:

- a. The Contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence, or
- b. If, in the government's judgment, the Contractor's spill cleanup is not adequately abating life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

### 3.13 CONTROL AND DISPOSAL OF HAZARDOUS WASTES

#### 3.13.1 Hazardous Waste/Debris Management

Identify all construction activities which will generate hazardous waste/debris. Provide a documented waste determination for all resultant waste streams. Hazardous waste/debris will be identified, labeled, handled, stored, and disposed of in accordance with all Federal, State, and local regulations including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268. Hazardous waste will also be managed in accordance with the approved Hazardous Waste Management Section of the Environmental Protection Plan. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities will be identified as being generated by the Government. Prior to removal of any hazardous waste from Government property, all hazardous waste manifests must be signed by activity personnel from the Station Environmental Office. No hazardous waste will be brought onto Government property. Provide to the Contracting Officer a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D. For hazardous wastes spills, verbally notify the Contracting Officer

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immediately.

3.13.1.1 Regulated Waste Storage/Satellite Accumulation/90 Day Storage Areas

If the work requires the temporary storage/collection of regulated or hazardous wastes, the Contractor will request the establishment of a Regulated Waste Storage Area, a Satellite Accumulation Area, or a 90 Day Storage Area at the point of generation. The Contractor must submit a request in writing to the Contracting Officer providing the following information:

|   |       |                        |       |
|---|-------|------------------------|-------|
| <u>Contract Number</u>                  | _____ | <u>Contractor</u>      | _____ |
| <u>Haz/Waste or Regulated Waste POC</u> | _____ | <u>Phone Number</u>    | _____ |
| <u>Type of Waste</u>                    | _____ | <u>Source of Waste</u> | _____ |
| <u>Emergency POC</u>                    | _____ | <u>Phone Number</u>    | _____ |
| <u>Location of the Site:</u> _____      |       |                        |       |
| (Attach Site Plan to the Request)       |       |                        |       |

Attach a waste determination form. Allow ten working days for processing this request.

3.14 DUST CONTROL

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.14.1 Dirt and Dust Control Plan

Submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on base roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

3.15 ABRASIVE BLASTING

3.15.1 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 in accordance with the requirements specified.

3.15.2 Disposal Requirements

Submit analytical results of the debris generated from abrasive blasting operations per paragraph entitled Laboratory Analysis of this section. Hazardous waste generated from blasting operations will be managed in

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accordance with paragraph entitled "Hazardous Waste\Debris Management" of this section and with the approved HWMP. Disposal of non-hazardous abrasive blasting debris will be in accordance with paragraph entitled, "Control and Disposal of Solid Wastes".

### 3.16 NOISE

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives will not be permitted without written permission from the Contracting Officer, and then only during the designated times.

### 3.17 Soil

Soils encountered during project activities shall be managed per Air Station soil management polices in affect for the duration of the project. If soil is encountered during construction operations that may be contaaminated (as indicated by odor, color, or unusual appearance) that was not previously indicated as contaminated, stop the portion of work immediately and notify the Contracting Officer immediately.

#### 3.17.1 Quarantne for Imported Fire Ants

Onslow, Jones, and Carteret Counties and portions of Duplin and Craven Counties have been declared a generally infested area by the United States Department of Agriculture (USDA) for the imported fire ant. Compliance with the quarantine regulations established by this authority as set forth is USDA Publication 301.81 of 31 December 1992, is required for operations hereunder. Pertinent requirements of quarantine for materials originating on the Camp Lejeune reservation, the Marine Corps Air Station (Helicopter), New River and the Marine Corps Air Station, Cherry Point, which are to be transported outside Onslow County or adjacent suppression areas, include the following:

a. Certification is required for the following articles and theu shall not be moved from the reservation to any point outside Onslow County and adjacent designated areas unless accompanied by a valid inspection certificate issued by an Officer of the Plant Protection and AQuarantine Program (PPQ) of the U.S. Department of Agriculture.

(1) Bulk soil

(2) Used Mechanized soil-moving equipment. (Used mechanized soil-moving equipment is exempt if cleaned of loose non compacted soil).

(3) Other products, articles, or means of conveyances, if it is determined by an inspector that they present a hazard of transporting spread of the imported fire ant and the person in possession therof has been so notified.

b. Authorization for movement of equipment outside the imported fire and regulated area shall be obtained from USDA, APHIS, PPQ, Attn: JB Perry, C/o NCSPA, 113 Arendell St. Room 216, Morehead City, NC 28557, telephone (252) 726-4358, fax (252) 726-5713. Requests for inspection shall be made sufficiently in advance of the date of movement to permit arrangement for the services of authorized inspectors. The equipment shall be prepared and assembled so that

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it may be readily inspected. Soil on or attached to equipment, supplies, and materials shall be removed by washing with water or such other means as necessary to accomplish complete removal. Resulting spoil shall be wasted as necessary and as directed.

-- End of Section --

SECTION 01 62 35

RECYCLED / RECOVERED MATERIALS

07/06

PART 1 GENERAL

1.1 REFERENCES

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

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

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.

EPA maintains a Database of Manufacturers and Suppliers for each designated item at <http://www.epa.gov/cpg/database.htm>. Use of sources from this database is not required. It is intended as a tool to assist purchasers in locating products with recycled content.

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 for non-use is provided. The following are considered adequate justifications for non-use:

- a. The product does not meet appropriate performance standards.
- b. The product is not available within a reasonable time frame.
- c. The product is not available competitively (from two or more sources).
- d. The product is only available at an unreasonable price (compared

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with a comparable non-recycled content product).

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 --

SECTION 01 77 00.00 20

CLOSEOUT PROCEDURES

07/06

PART 1 GENERAL

1.1 SUBMITTALS

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

SD-10 Operation and Maintenance Data

Equipment/Product Warranty List; G

Submit Data Package 1 in accordance with Section 01 78 23  
OPERATION AND MAINTENANCE DATA.

SD-11 Closeout Submittals

As-Built Drawings; G

Record Of Materials; G

Equipment/Product Warranty Tag; G

Monthly Project Waste Summary Report; G

Hazardous Material Reporting; G

Certification of EPA Designated Items; G

1.2 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items". The certification form shall include the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification shall read as follows and shall be signed and dated by the Contractor. Each product used in the project that has a requirement or option of containing recycled content in accordance with Section 01 62 35 RECYCLED/RECOVERED MATERIALS shall be recorded, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, total value of biobased content, exemptions (1, 2, 3, or 4, as indicated), and comments. Recycled and biobased content values may be determined by weight or volume percent, but must be consistent throughout.

1.3 PROJECT RECORD DOCUMENTS

1.3.1 As-Built Drawings

"NFAS 5252.236-9310, Record Drawings."

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1.3.2 As-Built Record of Materials

Furnish a record of materials.

Where several manufacturers' brands, types, or classes of the item listed have been used in the project, designate specific areas where each item was used. Designations shall be keyed to the areas and spaces depicted on the contract drawing. Furnish the record of materials used in the following format:

| MATERIALS DESIGNATION | SPECIFICATION | MANUFACTURER | MATERIALS USED (MANUFACTURER'S DESIGNATION) | WHERE USED |
|-----------------------|---------------|--------------|---|------------|
| (Roofing)             | _____         | _____        | _____                                       | _____      |
| (_____)               | _____         | _____        | _____                                       | _____      |

1.4 EQUIPMENT/PRODUCT WARRANTIES

1.4.1 Equipment/Product Warranty List

Furnish to the Contracting Officer a bound and indexed notebook containing written warranties for equipment/products furnished under the contract, and prepare a complete listing of such equipment/products. The equipment/products list shall state the specification section applicable to the equipment/product, duration of the warranty therefore, start date of the warranty, ending date of the warranty, and the point of contact for fulfillment of the warranty. The warranty period shall begin on the same date as project acceptance and shall continue for the full product warranty period. Execute the full list and deliver to the Contracting Officer prior to final acceptance of the facility.

1.4.2 Equipment Warranty Tags and Guarantor's Local Representative

Furnish with each warranty the name, address, and telephone number of the guarantor's representative nearest to the location where the equipment and appliances are installed. The guarantor's representative, upon request of the station representative, shall honor the warranty during the warranty period, and shall provide the services prescribed by the terms of the warranty. At the time of installation, tag each item of warranted equipment with a durable, oil- and water-resistant tag approved by the Contracting Officer. Attach tag with copper wire and spray with a clear silicone waterproof coating. Leave the date of acceptance and QC's signature blank until project is accepted for beneficial occupancy. Tag shall show the following information:

EQUIPMENT/PRODUCT WARRANTY TAG

Type of Equipment/Product \_\_\_\_\_  
Warranty Period \_\_\_\_\_ From \_\_\_\_\_ To \_\_\_\_\_  
Contract No. \_\_\_\_\_  
Inspector's Signature \_\_\_\_\_ Date Accepted \_\_\_\_\_

Construction Contractor:  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_

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Warranty Contact: \_\_\_\_\_  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_

STATION PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE

1.5 CLEANUP

Leave premises "broom clean." Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Replace filters of operating equipment. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

07/06

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, stressing and enhancing the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation. The subcontractors shall compile and prepare data and deliver to the Contractor prior to the training of Government personnel. The Contractor shall compile and prepare aggregate O&M data including clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.1.1 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, except as follows. Commissioned items without a specified data package requirement in the individual technical sections shall use Data Package 3. Commissioned items with a Data Package 1 or 2 requirement shall use instead Data Package 3.

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.

1.1.4 O&M Database

Develop a database from the O&M manuals that contains the information required to start a preventative maintenance program.

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 for the installed model and features of each

## Replace Steam Piping From MH38 to MH18

system:

### 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 install, 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 for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

### 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

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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

## Replace Steam Piping From MH38 to MH18

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:

#### 1.2.5.1 Product Submittal Data

Provide a copy of all SD-03 Product Data submittals required in the applicable technical sections.

#### 1.2.5.2 Manufacturer's Instructions

Provide a copy of all SD-08 Manufacturer's Instructions submittals required in the applicable technical sections.

#### 1.2.5.3 O&M Submittal Data

Provide a copy of all SD-10 Operation and Maintenance Data submittals required in the applicable technical sections.

#### 1.2.5.4 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

#### 1.2.5.5 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

#### 1.2.5.6 Personnel Training Requirements

Provide information available from the manufacturers that is needed for

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use in training designated personnel to properly operate and maintain the equipment and systems.

### 1.2.5.7 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.

### 1.2.5.8 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms.

### 1.2.5.9 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

## 1.3 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. Cleaning recommendations
- c. Maintenance and repair procedures
- d. Warranty information
- e. Contractor information
- f. 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. Cleaning recommendations
- g. Maintenance and repair procedures

## Replace Steam Piping From MH38 to MH18

- h. Removal and replacement instructions
- i. Spare parts and supply list
- j. Parts identification
- k. Warranty information
- l. Contractor information

### 1.3.3 Data Package 3

- a. Safety precautions
- b. Operator prestart
- c. Startup, shutdown, and post-shutdown procedures
- d. Normal operations
- e. Emergency operations
- f. Environmental conditions
- g. Lubrication data
- h. Preventive maintenance plan and schedule
- i. Cleaning recommendations
- 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. Product submittal data
- p. O&M submittal data
- q. Parts identification
- r. Warranty information
- s. Testing equipment and special tool information
- t. Testing and performance data
- u. Contractor information

### 1.3.4 Data Package 4

- a. Safety precautions

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- 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. Cleaning recommendations
- k. Troubleshooting guides and diagnostic techniques
- l. Wiring diagrams and control diagrams
- m. Maintenance and repair procedures
- n. Removal and replacement instructions
- o. Spare parts and supply list
- p. Corrective maintenance man-hours
- q. Product submittal data
- r. O&M submittal data
- s. Parts identification
- t. Warranty information
- u. Personnel training requirements
- v. Testing equipment and special tool information
- w. Testing and performance data
- x. 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

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- g. Troubleshooting guides and diagnostic techniques
- h. Wiring and control diagrams
- i. Maintenance and repair procedures
- j. Removal and replacement instructions
- k. Spare parts and supply list
- l. Product submittal data
- m. Manufacturer's instructions
- n. O&M submittal data
- o. Parts identification
- p. Testing equipment and special tool information
- q. Warranty information
- r. Testing and performance data
- s. Contractor information

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 80 00

REPORTS

07/06

PART 1 GENERAL

1.1 REPORTS INCLUDED

None

1.2 USE OF INFORMATION

1.2.1 Warranty

The information disclosed in the referenced reports is based on data obtained in specific locations and is assumed to be representative of conditions throughout the site. This information is furnished without warranty and is only for general information to be used by the contractor in the preparation of his bid and work schedule. It is not intended as a replacement for personal investigation and judgment, or interpretation of the information furnished, as required of the contractor in the performance of this contract.

1.2.2 Site Visit

Bidders should visit the site and acquaint themselves with all existing conditions prior to preparing their bid. This will include a review of the conditions contained in the enclosed report as they relate to the site. The contractor is responsible for including in his bid and work schedule, procedures for handling existing site conditions delineated in the included reports in accord with applicable laws and regulations as those conditions may effect the work.

1.2.3 Application of Information

Recommendations contained in the reports are to be used by the contractor only to the extent that these recommendations comply with applicable laws, regulations, and other sections of the these specifications.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 VARYING CONDITIONS

If during the course of the work, conditions are encountered which are not covered in the included reports or are different from conditions that would be reasonably anticipated from the included reports, the contractor shall immediately notify the Officer in Charge of Construction. If such conditions are hazardous or the continuation of work would cause a hazardous condition to develop, he shall stop work and proceed as directed by the Officer in Charge of Construction as directed by provisions contained in other sections of this specification. This may include modifications to, or the development of a new, Health and Safety Plan for this project, and alternate or additional appropriate abatement procedures.

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### 3.2 CHANGES TO THE CONTRACT

Any changes to the contract made as a result of site conditions which differ from those delineated in the report may result in an adjustment of the contract amount. The adjustment will be an increase or decrease depending on the scope and nature of the change and will be in accord with other provisions of these specifications.

-- End of Section --

SECTION 02 41 00

DEMOLITION  
11/04

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE EM 385-1-1 (2003) Safety -- Safety and Health Requirements

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

40 CFR 61-SUBPART M National Emission Standard for Asbestos

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 buildings. In the interest of occupational safety and health, perform the work in accordance with COE EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Demolition plan; G

Notifications; G

Proposed demolition and removal procedures for approval before work is started.

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," conform to the safety requirements contained in ANSI A10.6.

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### 1.4.1 Notifications

#### 1.4.1.1 General Requirements

Furnish timely notification of demolition projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61-SUBPART M. Notify the State's environmental protection agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61-SUBPART M.

### 1.5 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris to occupied portions of the building and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to aircraft.

### 1.6 PROTECTION

#### 1.6.1 Traffic Control Signs

Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning such work.

#### 1.6.2 Existing Work

Before beginning any demolition work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing work in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, the location and extent of cracks and other damage and description of surface conditions that exist prior to before starting work.

#### 1.6.3 Items to Remain in Place

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Contracting Officer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements for pavements to remain. Provide new supports and reinforcement for existing construction weakened by demolition or removal work. Repairs, reinforcement, or structural replacement require approval by the Contracting Officer prior to performing such work.

#### 1.6.4 Existing Construction

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or

## Replace Steam Piping From MH38 to MH18

other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

### 1.6.5 Weather Protection

For portions of the building to remain, protect building interior and materials and equipment from the weather at all times. Where removal of existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas.

### 1.6.6 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Government and disconnected and sealed by the Contractor.

### 1.6.7 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by the Contracting Officer. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

### 1.6.8 Protection of Personnel

Before, during and after the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

### 1.7 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 must include a fence covered with a fabric designed to stop the spread of debris. Anchor the fence and fabric to prevent displacement by winds or jet/prop blasts.

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Remove barricade when no longer required.

1.9 REQUIRED DATA

The Demolition plan shall include procedures for 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. Provide procedures for safe conduct of the work in accordance with COE EM 385-1-1.

1.10 ENVIRONMENTAL PROTECTION

Comply with the Environmental Protection Agency requirements specified.

1.11 USE OF EXPLOSIVES

Use of explosives will not be permitted.

PART 2 PRODUCTS

2.1 FILL MATERIAL

Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill basements, voids, depressions or excavations resulting from demolition of structures.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

3.1.1 Structures

a. Remove existing structures to the extent indicated.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contracting Officer. Do not interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities, 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 in accordance with instructions of the Contracting Officer.

3.1.3 Paving and Slabs

Sawcut concrete and asphaltic concrete paving and slabs as indicated to a

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depth of 12 inches below existing adjacent grade. Provide neat sawcuts at limits of pavement removal as indicated.

### 3.1.4 Concrete

Saw concrete along straight lines to a depth of a minimum 11 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

### 3.1.5 Patching

Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

- a. Concrete and Masonry: Completely fill holes and depressions, caused by previous physical damage or left as a result of removals in existing masonry walls to remain, with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

## 3.2 DISPOSITION OF MATERIAL

### 3.2.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition, and 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.

## 3.3 CLEANUP

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. Apply local regulations regarding hauling and disposal.

## 3.4 DISPOSAL OF REMOVED MATERIALS

Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified. Removed materials shall not be stored on the project site.

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-- End of Section --

SECTION 02 50 00

ASPHALT PAVEMENT REPAIR

01/07

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

|             |   |
|-------------|---|
| ASTM D 698  | (2000ae1) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.)) |
| ASTM D 1188 | (1989) Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens               |
| ASTM D 1556 | (2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method   |
| ASTM D 2726 | (2000) Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens         |
| ASTM D 2922 | (2004) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)                                   |
| ASTM D 3017 | (2004) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)                                       |

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT)

|       |   |
|-------|---|
| NCDOT | (2006) Standard Specifications for Roads and Structures |
|-------|---|

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00, "Submittal Procedures".

SD-03 Product Data

- Pavement mix; G
- Tack coat; G
- Stone; G

Replace Steam Piping From MH38 to MH18

SD-05 Design Data

Job-mix formula; G

SD-07 Certificates; G

Asphalt Removal Recycling Establishment - Location, Name, Address of Operator, and Telephone Number

1.2.1 Job-Mix Formula

Submit the mix design, including mixing temperature, for approval. The mix design shall include a certified laboratory analysis of mix composition with marshall stability value, void content, and flow. After mix design approval, job mixes shall conform to the range of tolerances specified in NCDOT. An identical mix design previously approved within the past 12 months by the Atlantic Division, Naval Facilities Engineering Command, may be used without further approval, provided that copies of the previous approval are submitted. Obtain acknowledgement of receipt prior to bituminous concrete placement. Submit additional data regarding materials if the source of the materials changes.

1.3 GENERAL REQUIREMENTS

All "Section" references refer to NCDOT, Standard Specifications for Roads and Structures. In all references

- a. The articles entitled "Method of Measurement", "Basis of Payment" and "Acceptance of Bituminous Materials" will not apply.
- b. All references to "Engineer" shall mean "Contracting Officer".
- c. All work shall conform to NCDOT, Roadway Standards.

1.4 ASPHALT/BITUMINOUS PAVEMENT MATERIAL OPTION

The Contractor has the option to provide either of the following pavement materials:

- a. Asphalt/Bituminous Mix with recycled aggregate material

Mix shall contain recycled/reclaimed asphalt material not to exceed 25 percent by weight of the total aggregate material. Mix design shall conform to Section 611 and the Sections for the Type of material specified. The submittal shall clearly state:

|                            |                              |
|----------------------------|------------------------------|
| Recycled Asphalt Cement    | Viscosity                    |
| New Asphalt Cement         | Grade                        |
| Recycling Agent(s), if any | Properties                   |
| Mix Composition            | Percentage of Each Component |

- or -

- b. Asphalt/Bituminous Mix conforming to NCDOT Section 610 and the Sections for the Type of material specified.

1.5 RECYCLED ASPHALT MATERIAL

Mix may contain a maximum of 25 percent by weight of the total aggregate

Replace Steam Piping From MH38 to MH18

material, reclaimed asphalt pavement (RAP). Mix design shall meet the requirements for the type of bituminous concrete specified. Clearly state the viscosity of reclaimed asphalt cement, grade of new asphalt cement, properties of recycled agent if used, and percentage of each in the mix. Combine asphalts and recycling agents to achieve a viscosity of 2000 plus or minus 400 poises at 140 degrees F. Furnish a new job mix formula for each change in percentage of RAP material used.

PART 2 PRODUCTS

2.1 TACK COAT

Work and materials shall conform to NCDOT Section 605.

2.2 ASPHALTIC CONCRETE BASE COURSE

Shall conform to NCDOT Type B-25.0B, in accordance with Section 610.

2.3 ASPHALT CONCRETE INTERMEDIATE COURSE

Shall conform to NCDOT Type I-19.0B in accordance with Section 610.

2.4 ASPHALTIC CONCRETE SURFACE COURSE

Shall conform to NCDOT Type SF-9.5A, in accordance with Section 610.

2.5 AGGREGATE

2.5.1 Aggregate Base Course

Work and materials shall conform to NCDOT Section 1005 and 1010, standard size ABC.

2.5.2 Stone

Work and materials shall conform to NCDOT Section 1005 and 1010, standard size 57.

2.6 SIGNAGE

Work and materials conform to NCDOT Division 9.

PART 3 EXECUTION

3.1 CONSTRUCTION METHODS

Work shall conform to the NCDOT Standard Specifications sections referenced herein before and to the following:

3.2 ASPHALT CONCRETE PAVEMENT AND PATCHWORK

3.2.1 Stone Base Course Placement

Begin spreading base material at the point nearest the source of supply. Permit traffic and hauling over the base, Fill ruts formed by traffic and reroll. After base course placement, continue machining and rolling until surface is smooth, compacted, well boded, and true to the designed cross section. Compact to 100 percent ASTM D 698 maximum dry density. Maintain the base smooth and true to grade and cross section until bituminous

## Replace Steam Piping From MH38 to MH18

concrete placement.

### 3.2.2 Cleaning

Before commencing the operations on any portion of the work, the surface of the existing pavement and any new base course shall be thoroughly cleaned of all foreign matter including grass by mechanical means if feasible.

### 3.2.3 Patchwork

All asphalt surfacing and loose stone base course shall be removed. Stone base course materials removed shall be replaced with a new stone base course and asphaltic concrete mixture. The patchwork shall be accomplished in advance of placing the surface course, and the surface course placed continuously over the entire area.

### 3.2.4 Placing of the Asphaltic Concrete

Shall be as nearly continuous as possible. The rollers shall pass over the unprotected end of the mixture only when laying is discontinued for sufficient time to permit the mixture to cool, in which case, a joint shall be made by cutting back the surface course to expose a granular surface for its full depth to bond with the fresh mixture. When laying is resumed, the exposed edge shall be coated with hot asphaltic cement and the fresh mixture raked against the joint, thoroughly tamped with hot tamps and rolled. Repaint striping to match existing. Paints shall be permanent retro reflective type conforming to NCDOT Section 1087.

### 3.2.5 Finished Surfaces

Shall be uniform in texture and appearance and free from cracks and creases. The finished surface shall vary not more than 1/8-inch when the test for smoothness is performed with a 10-foot straightedge. The finished thickness shall be not less than the specified thickness minus 1/8-inch. Where the irregularity of the surface or the deficiency in depth is more than the specified tolerances, the defective work shall be removed and replaced with new material, as directed, without additional cost to the Government.

### 3.2.6 Featheredges

Accomplish featheredging by raking out the larger aggregate as necessary and sloping the pavement uniformly throughout the featheredge to create a smooth transition. Unless indicated otherwise, featheredge transition shall be 10 feet.

### 3.2.7 Bituminous Materials and/or Mixtures

Shall not be produced or placed when weather is rainy or foggy, or when the air temperature is less than 40 degrees Fahrenheit in the shade away from artificial heat.

### 3.2.8 Protection of Pavement

After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until it has cooled and hardened.

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### 3.3 FIELD QUALITY CONTROL

#### 3.3.1 Sampling

Provide new materials where samples are taken. Take the number and size of samples required to perform the following tests.

##### 3.3.1.1 Asphaltic Concrete Sampling

- a. Job Mix: Take one initial sample and one sample for every 400 tons or fraction thereof.
- b. Thickness: Take one sample for every 500 square yards or fraction thereof.
- c. Density: One field test for every 1000 square yards or fraction thereof, and one laboratory test for the project. Provide minimum 4-inch diameter cores if nuclear testing is not used.

##### 3.3.1.2 Stone Base Course Sampling

- a. Thickness: Take one sample for every 500 square yards or fraction thereof.
- b. Density: One field test for every 1000 square yards or fraction thereof, and one laboratory test for the project.

#### 3.3.2 Testing

Provide for each sample.

##### 3.3.2.1 Bituminous Concrete Testing

- a. Job Mix: Determine gradation and bitumen content.
- b. Thickness: Maximum allowable deficiency shall be 1/4 inch less than the indicated thickness. Average thickness shall be as indicated.
- c. Density, In Place: ASTM D 2922 and ASTM D 3017; cored sample ASTM D 1188 or ASTM D 2726/

##### 3.3.2.2 Stone Base Course Testing

- a. Thickness: Maximum allowable deficiency shall be 1/2 inch less than the indicated thickness. Average thickness shall be as indicated.
- b. Density: ASTM D 1556 or ASTM D 2922 and ASTM D 3017.

-- End of Section --

SECTION 03 30 00.00 20

CAST-IN-PLACE CONCRETE

02/02

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.

ACI INTERNATIONAL (ACI)

|                |   |
|----------------|---|
| ACI 211.1      | (1991) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete |
| ACI 301        | (1999) Specifications for Structural Concrete for Buildings                                   |
| ACI 302.1R     | (1996) Guide for Concrete Floor and Slab Construction   |
| ACI 304R       | (2000) Guide for Measuring, Mixing, Transporting, and Placing Concrete                        |
| ACI 305R       | (1999) Hot Weather Concreting   |
| ACI 306.1      | (1990) Standard Specification for Cold Weather Concreting                                     |
| ACI 318M/318RM | (2002) Metric Building Code Requirements for Structural Concrete and Commentary               |
| ACI 347R       | (2001) Guide to Formwork for Concrete   |

AMERICAN HARDBOARD ASSOCIATION (AHA)

|            |                        |
|------------|------------------------|
| AHA A135.4 | (1995) Basic Hardboard |
|------------|------------------------|

ASTM INTERNATIONAL (ASTM)

|                   |   |
|-------------------|---|
| ASTM A 123/A 123M | (2002) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products    |
| ASTM A 496        | (2002) Steel Wire, Deformed, for Concrete Reinforcement                 |
| ASTM A 615/A 615M | (2003a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement |
| ASTM A 616/A 616M | (1996a) Rail-Steel Deformed and Plain Bars for Concrete Reinforcement   |
| ASTM A 617/A 617M | (1996a) Axle-Steel Deformed and Plain Bars for Concrete Reinforcement   |

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|                   |   |
|-------------------|---|
| ASTM A 82         | (2002) Steel Wire, Plain, for Concrete Reinforcement  |
| ASTM C 1107       | (2002) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)   |
| ASTM C 1240       | (2003a) Silica Fume for Use as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar and Grout   |
| ASTM C 143/C 143M | (2003) Slump of Hydraulic Cement Concrete   |
| ASTM C 150        | (2002ae1) Portland Cement   |
| ASTM C 172        | (1999) Sampling Freshly Mixed Concrete  |
| ASTM C 173/C 173M | (2001e1) Air Content of Freshly Mixed Concrete by the Volumetric Method                             |
| ASTM C 192/C 192M | (2002) Making and Curing Concrete Test Specimens in the Laboratory                                  |
| ASTM C 231        | (2003) Air Content of Freshly Mixed Concrete by the Pressure Method                                 |
| ASTM C 260        | (2001) Air-Entraining Admixtures for Concrete   |
| ASTM C 309        | (2003) Liquid Membrane-Forming Compounds for Curing Concrete  |
| ASTM C 31/C 31M   | (2003a) Making and Curing Concrete Test Specimens in the Field                                      |
| ASTM C 33         | (2003) Concrete Aggregates  |
| ASTM C 39         | (1993a) Compressive Strength of Cylindrical Concrete Specimens                                      |
| ASTM C 42/C 42M   | (2003) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete                              |
| ASTM C 494/C 494M | (1999ae1) Chemical Admixtures for Concrete  |
| ASTM C 59/C 59M5  | (2000; Rev A) Blended Hydraulic Cements   |
| ASTM C 618        | (2003) 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 94/C 94M   | (2003a) Ready-Mixed Concrete  |
| ASTM C 989        | (1999) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars                         |

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U.S. DEPARTMENT OF COMMERCE (DOC)

PS1 (1995) Construction and Industrial Plywood  
(APA V995)

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

The following shall be submitted in accordance with Section 01 33 00  
SUBMITTAL PROCEDURES:

SD-03 Product Data

Materials for curing concrete; G

Epoxy bonding compound; G

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, silica fume, 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. In addition, copies of the fly ash, silica fume and pozzolan test results shall be submitted. The approval of fly ash, silica fume and pozzolan test results shall have been within 6 months of submittal date. Obtain acknowledgement of receipt prior to concrete placement.

SD-06 Test Reports

Concrete mix design; G

Compressive strength tests

Air Content

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#### 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 vapor barrier, forms, reinforcement, embedded items, and chamfer strips are in place and ready for concrete placement. ACI 301 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.

#### 1.6 Quality Assurance

##### 1.6.1 Test Reports

##### 1.6.1.1 Concrete Mix Design

Submit copies of laboratory test reports showing that the mix has been successfully tested to produce concrete with the properties specified and that mix will be suitable for the job conditions. The laboratory test reports shall include mill test and all other test for cement, silica fume, aggregates, and admixtures. Provide maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve, and a graph of percentage retained verses sieve size. Test reports shall be submitted along with the concrete mix design. Obtain approval before concrete placement.

## 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: PS1, 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.

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2.3 CONCRETE

2.3.1 Contractor-Furnished Mix Design

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

| Location                          | f'c<br>(Min. 28-<br>Day Comp.<br>Strength)<br>(psi) | ASTM C 33<br>Maximum<br>Nominal<br>Aggregate<br>(Size No.) | Range<br>of<br>Slump<br>(inches) | Maximum<br>Water-<br>Cement<br>Ratio<br>(by weight) |
|-----------------------------------|---|--|----------------------------------|---|
| Concrete<br>exposed<br>to weather | 4000  | 57   | 1-3                              | 0.50  |

Maximum slump shown above may be increased 1 inch for methods of consolidation other than vibration. Slump may be increased to 8 inches when superplasticizers are used.

2.3.1.1 Mix Proportions for Normal Weight Concrete

Trial design batches, mixture proportioning studies, and testing requirements for various classes and types of concrete specified shall be the responsibility of the Contractor. Mixture proportions shall be based on compressive strength as determined by test specimens fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39. Samples of all materials used in mixture proportioning studies shall be representative of those proposed for use in the project and shall be accompanied by the manufacturer's or producer's test report indicating compliance with these specifications. Trial mixtures having proportions, consistencies, and suitable for the work shall be made based on methodology described in ACI 211.1. The trial mixture shall use 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 on the project. The maximum water-cement ratio required will be based on equivalent water-cement ratio calculations as determined by the conversion from the weight ratio of water to cement plus pozzolan, silica fume, and ground granulated blast-furnace slag by weight equivalency method. Laboratory trial mixture shall be designed for maximum permitted slump and air content. Each combination of material proposed for use shall have separate trial mixture, except for accelerator or retarder use can be provided without separate trial mixture. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39 for 7 and 28 days. From these results, a curve shall be plotted showing the relationship between water-cement ratio and strength for each set of trial mix studies. In addition a curve shall be plotted showing the relationship between 7 and 28 day strengths.

2.3.1.2 Required Average Strength of Mix Design

The selected mixture shall produce an average compressive strength exceeding the specified strength by the amount indicated in ACI 301. When a concrete production facility has a record of at least 15 consecutive

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tests, the standard deviation shall be calculated and the required average compressive strength shall be determined in accordance with ACI 301. When a concrete production facility does not have a suitable record of tests to establish a standard deviation, the required average strength shall be as follows:

- a. For f'c less than 3000 psi, 1000 psi plus f'c.
- b. For f'c between 3000 and 5000 psi, 1200 psi plus f'c.

### 2.4 MATERIALS

#### 2.4.1 Cement

ASTM C 150, Type I or II or ASTM C 59/C 59M5, Type IP(MS) or IS(MS) blended cement except as modified herein. The blended cement shall consist of a mixture of ASTM C 150, Type II, cement and one of 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 Silica Fume

ASTM C 1240, provide silica fume that is a by-product of silicon or ferrosilicon production. Provide 5 percent by weight of the total cementitious material.

#### 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.

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#### 2.4.5.1 Air-Entraining

ASTM C 260.

#### 2.4.6 Materials for Curing Concrete

##### 2.4.6.1 Liquid Membrane-Forming Compound

ASTM C 309, white-pigmented, Type 2, Class B.

##### 2.4.7 Epoxy Bonding Compound

ASTM C 881. Provide Type I for bonding hardened concrete to hardened concrete; Type II for bonding freshly mixed concrete to hardened concrete; and Type III as a binder in epoxy mortar or concrete, or for use in bonding skid-resistant materials to hardened concrete. Provide Grade 1 or 2 for horizontal surfaces and Grade 3 for vertical surfaces. Provide Class A if placement temperature is below 40 degrees F; Class B if placement temperature is between 40 and 60 degrees F; or Class C if placement temperature is above 60 degrees F.

#### 2.5 REINFORCEMENT

Bars, fabrics, connectors, and chairs shall be galvanized.

##### 2.5.1 Reinforcing Bars

ACI 301 unless otherwise specified. ASTM A 615/A 615M and ASTM A 617/A 617M with the bars marked A, S, W, Grade 60; or ASTM A 616/A 616M with the bars marked R, Grade 60. Galvanized, ASTM A 123/A 123M.

##### 2.5.2 Wire

ASTM A 82 or ASTM A 496.

##### 2.5.3 Reinforcing Bar Supports

Provide bar ties and supports of coated or non corrodible material.

#### PART 3 EXECUTION

##### 3.1 FORMS

ACI 301. Provide forms, shoring, and scaffolding for concrete placement. Set forms mortar-tight and true to line and grade. Chamfer above grade exposed joints, edges, and external corners of concrete 0.75 inch unless otherwise indicated. Provide formwork with clean-out openings to permit inspection and removal of debris. Forms submerged in water shall be watertight.

##### 3.1.1 Coating

Before concrete placement, coat the contact surfaces of forms with a nonstaining mineral oil, nonstaining form coating compound, or two coats of nitrocellulose lacquer. Do not use mineral oil on forms for surfaces to which adhesive, paint, or other finish material is to be applied.

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### 3.1.2 Removal of Forms and Supports

After placing concrete, forms shall remain in place for the time periods specified in ACI 347R. Prevent concrete damage during form removal.

## 3.2 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

ACI 301. 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.

### 3.2.1 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.

### 3.2.2 Cover

ACI 301 for minimum coverage, unless otherwise indicated.

### 3.2.3 Setting Miscellaneous Material

Place and secure anchors and bolts, pipe sleeves, conduits, and other such items in position before concrete placement. Plumb anchor bolts and check location and elevation. Temporarily fill voids in sleeves with readily removable material to prevent the entry of concrete.

## 3.3 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE

ASTM C 94/C 94M, ACI 301, ACI 302.1R, and ACI 304R, except as modified herein. Batching equipment shall be such that the concrete ingredients are consistently measured within the following tolerances: 1 percent for cement and water, 2 percent for aggregate, and 3 percent for admixtures. Furnish mandatory batch ticket information for each load of ready mix concrete.

### 3.3.1 Measuring

Make measurements at intervals as specified in paragraphs entitled "Sampling" and "Testing."

### 3.3.2 Mixing

ASTM C 94/C 94M and ACI 301. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time and place concrete within 60 minutes if the air temperature is greater than 85 degrees F except as follows: if set retarding admixture is used and slump requirements can be met, limit for placing concrete may remain at 90 minutes. Additional water may be added, provided that both the specified maximum slump and water-cement ratio are not exceeded. When additional water is added, an additional 30 revolutions of the mixer at mixing speed is required. If the

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entrained air content falls below the specified limit, add a sufficient quantity of admixture to bring the entrained air content within the specified limits. Dissolve admixtures in the mixing water and mix in the drum to uniformly distribute the admixture throughout the batch.

### 3.3.3 Transporting

Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete which has segregated in transporting and dispose of as directed.

## 3.4 PLACING CONCRETE

Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris, water, snow, and ice from within the forms. Deposit concrete as close as practicable to the final position in the forms. Do not exceed a free vertical drop of 3 feet from the point of discharge. Place concrete in one continuous operation from one end of the structure towards the other.

### 3.4.1 Application of Epoxy Bonding Compound

Apply a thin coat of compound to dry, clean surfaces. Scrub compound into the surface with a stiff-bristle brush. Place concrete while compound is stringy. Do not permit compound to harden prior to concrete placement. Follow manufacturer's instructions regarding safety and health precautions when working with epoxy resins.

### 3.4.2 Cold Weather

ACI 306.1. Do not allow concrete temperature to decrease below 50 degrees F. Obtain approval prior to placing concrete when the ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. Cover concrete and provide sufficient heat to maintain 50 degrees F minimum adjacent to both the formwork and the structure while curing. Limit the rate of cooling to 5 degrees F in any 1 hour and 50 degrees F per 24 hours after heat application.

### 3.4.3 Hot Weather

ACI 305R. Maintain required concrete temperature using Figure 2.1.5 in ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the use of either liquid membrane curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.

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### 3.5 SURFACE FINISHES EXCEPT FLOOR, SLAB, AND PAVEMENT FINISHES

#### 3.5.1 Defects

Repair formed surfaces by removing minor honeycombs, pits greater than 1 square inch surface area or 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.

#### 3.5.2 Smooth Finish

Provide concrete indicated with a smooth finish.

### 3.6 CURING AND PROTECTION

ACI 301 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. Provide moist curing for those areas receiving liquid chemical sealer-hardener or epoxy coating.

#### 3.6.1 Liquid Membrane-Forming Curing Compound

Seal or cover joint openings prior to application of curing compound. Prevent curing compound from entering the joint. Apply in accordance with the recommendations of the manufacturer immediately after any water sheen which may develop after finishing has disappeared from the concrete surface. Provide and maintain compound on the concrete surface throughout the curing period. Do not use this method of curing where the use of Figure 2.1.5 in ACI 305R indicates that hot weather conditions will cause an evaporation rate exceeding 0.2 pound of water per square foot per hour.

##### 3.6.1.1 Application

Unless the manufacturer recommends otherwise, apply compound immediately after the surface loses its water sheen and has a dull appearance, and before joints are sawed. Mechanically agitate curing compound thoroughly during use. Use approved power-spraying equipment to uniformly apply two coats of compound in a continuous operation. The total coverage for the two coats shall be 200 square feet maximum per gallon of undiluted compound unless otherwise recommended by the manufacturer's written instructions. The compound shall form a uniform, continuous, coherent film that will not

## Replace Steam Piping From MH38 to MH18

check, crack, or peel. Immediately apply an additional coat of compound to areas where the film is defective. Re-spray concrete surfaces subjected to rainfall within 3 hours after the curing compound application.

### 3.6.1.2 Protection of Treated Surfaces

Prohibit pedestrian and vehicular traffic and other sources of abrasion at least 72 hours after compound application. Maintain continuity of the coating for the entire curing period and immediately repair any damage.

## 3.7 FIELD QUALITY CONTROL

### 3.7.1 Sampling

ASTM C 172. Collect samples of fresh concrete to perform tests specified. ASTM C 31/C 31M for making test specimens.

### 3.7.2 Testing

#### 3.7.2.1 Slump Tests

ASTM C 143/C 143M. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 20 cubic yards (maximum) of concrete.

#### 3.7.2.2 Temperature Tests

Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

#### 3.7.2.3 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 tests of each mix design of concrete placed each day shall be taken not less than once a day, nor less than once for each 100 cubic yards of concrete, nor less than once for each 5000 square feet of surface area for slabs or walls. 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 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.

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3.7.2.4 Air Content

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

-- End of Section --

SECTION 05 50 00

METAL: MISCELLANEOUS AND FABRICATIONS

02/05

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 WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2004) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M (2002) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A 153/A 153M (2004) Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A 36/A 36M (2004) Carbon Structural Steel

ASTM A 653/A 653M (2004a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM A 780 (2001) Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings

ASTM A 924/A 924M (2004) General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

ASTM D 1187 (1997; R 2002e1) Asphalt-Base Emulsions for Use as Protective Coatings for Metal

MASTER PAINTERS INSTITUTE (MPI)

MPI 79 (Jan 2004) Alkyd Anti-Corrosive Metal Primer

1.2 QUALIFICATION OF WELDERS

Qualify welders in accordance with AWS D1.1/D1.1M. Use procedures, materials, and equipment of the type required for the work.

1.3 DELIVERY, STORAGE, AND PROTECTION

Protect from corrosion, deformation, and other types of damage. Store items in an enclosed area free from contact with soil and weather. Remove and replace damaged items with new items.

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## PART 2 PRODUCTS

### 2.1 MATERIALS

#### 2.1.1 Structural Carbon Steel

ASTM A 36/A 36M.

### 2.2 FABRICATION FINISHES

#### 2.2.1 Galvanizing

Hot-dip galvanize items specified to be zinc-coated, after fabrication where practicable. Galvanizing: ASTM A 123/A 123M, ASTM A 153/A 153M, ASTM A 653/A 653M or ASTM A 924/A 924M, G90, as applicable.

#### 2.2.2 Galvanize

Anchor bolts, grating fasteners, washers, and parts or devices necessary for proper installation, unless indicated otherwise.

#### 2.2.3 Repair of Zinc-Coated Surfaces

Repair damaged surfaces with galvanizing repair method and paint conforming to ASTM A 780 or by application of stick or thick paste material specifically designed for repair of galvanizing, as approved by Contracting Officer. Clean areas to be repaired and remove slag from welds. Heat surfaces to which stick or paste material is applied, with a torch to a temperature sufficient to melt the metallics in stick or paste; spread molten material uniformly over surfaces to be coated and wipe off excess material.

#### 2.2.4 Nonferrous Metal Surfaces

Protect by plating, anodic, or organic coatings.

### 2.3 MISCELLANEOUS PLATES AND SHAPES

Provide for items that do not form a part of the structural steel framework, such as lintels, sill angles, miscellaneous mountings and frames.

## PART 3 EXECUTION

### 3.1 GENERAL INSTALLATION REQUIREMENTS

Install items at locations indicated, according to manufacturer's instructions. The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Joints exposed to the weather shall be formed to exclude water.

## Replace Steam Piping From MH38 to MH18

### 3.2 WORKMANSHIP

Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean true lines and surfaces. Welding shall be continuous along the entire area of contact except where tack welding is permitted. Exposed connections of work in place shall not be tack welded. Exposed welds shall be ground smooth. Exposed surfaces of work in place shall have a smooth finish, and unless otherwise approved, exposed riveting shall be flush. Where tight fits are required, joints shall be milled. Corner joints shall be coped or mitered, well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Installation shall be in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

### 3.3 ANCHORAGE, FASTENINGS, AND CONNECTIONS

Provide anchorage where necessary for fastening miscellaneous metal items securely in place. Include for anchorage not otherwise specified or indicated slotted inserts, expansion shields, and powder-driven fasteners, when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; through bolts, lag bolts, and screws for wood. Do not use wood plugs in any material. Provide non-ferrous attachments for non-ferrous metal. Make exposed fastenings of compatible materials, generally matching in color and finish, to which fastenings are applied. Conceal fastenings where practicable.

### 3.4 BUILT-IN WORK

Form for anchorage metal work built-in with concrete or masonry, or provide with suitable anchoring devices as indicated or as required. Furnish metal work in ample time for securing in place as the work progresses.

### 3.5 WELDING

Perform welding, welding inspection, and corrective welding, in accordance with AWS D1.1/D1.1M. Use continuous welds on all exposed connections. Grind visible welds smooth in the finished installation.

### 3.6 FINISHES

#### 3.6.1 Dissimilar Materials

Where dissimilar metals are in contact, protect surfaces with a coat conforming to MPI 79 to prevent galvanic or corrosive action. Where aluminum is in contact with concrete, plaster, mortar, masonry, wood, or absorptive materials subject to wetting, protect with ASTM D 1187, asphalt-base emulsion.

#### 3.6.2 Field Preparation

Remove rust preventive coating just prior to field erection, using a remover approved by the rust preventive manufacturer. Surfaces, when assembled, shall be free of rust, grease, dirt and other foreign matter.

#### 3.6.3 Environmental Conditions

Do not clean or paint surface when damp or exposed to foggy or rainy weather, when metallic surface temperature is less than 5 degrees F above

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the dew point of the surrounding air, or when surface temperature is below 45 degrees F or over 95 degrees F, unless approved by the Contracting Officer.

-- End of Section --

SECTION 31 23 00.00 20

EXCAVATION AND FILL

06/04

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 C 136  | (2001) Sieve Analysis of Fine and Coarse Aggregates   |
| ASTM D 698  | (2000a) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.)) |
| ASTM D 1140 | (2000) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve                                       |
| ASTM D 1556 | (2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method   |
| ASTM D 1557 | (2002) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.)) |
| ASTM D 2216 | (1998) Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass                                  |
| ASTM D 2321 | (2000) Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications                  |
| ASTM D 2487 | (2000) Soils for Engineering Purposes (Unified Soil Classification System)  |
| ASTM D 2922 | (2001) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)                                 |
| ASTM D 3017 | (2001) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)                                     |
| ASTM D 4318 | (2000) Liquid Limit, Plastic Limit, and Plasticity Index of Soils   |

AMERICAN WATER WORKS ASSOCIATION (AWWA)

|           |   |
|-----------|---|
| AWWA C600 | (1999) Installation of Ductile-Iron Water Mains and Their Appurtenances |
|-----------|---|

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U.S. ARMY CORPS OF ENGINEERS (USACE)

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

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 530/F-93/004 (1993; Rev O; Updates I, II, IIA, IIB, and III) Test Methods for Evaluating Solid Waste (Vol IA, IB, IC, and II) (SW-846)

EPA 600/4-79/020 (1983) Methods for Chemical Analysis of Water and Wastes

1.2 DEFINITIONS

1.2.1 Degree of Compaction

Degree of compaction is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 698 or ASTM D 1557, for general soil types, abbreviated as percent laboratory maximum density.

1.2.2 Hard Materials

Weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.2.3 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1 cubic yard in volume. Removal of hard material will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Shoring and Sheeting Plan; G

Dewatering work plan; G

Submit 15 days prior to starting work.

SD-06 Test Reports

Borrow Site Testing; G

Fill and backfill test; G

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Density tests; G

Moisture Content Tests; G

Copies of all laboratory and field test reports within 24 hours of the completion of the test.

1.4 DELIVERY, STORAGE, AND HANDLING

Perform in a manner to prevent contamination or segregation of materials.

1.5 CRITERIA FOR BIDDING

For bidding purposes, assume no contaminated soils. However, if any soil is detected either visually or by odor to exhibit an abnormal or unnatural color, a chemical or petroleum odor, or is saturated with a chemical or petroleum, work shall be immediately stopped in that area. In addition, the Contracting Officer shall be notified and EAD advised of the situation so a course of action can be developed to address the contamination. This soil would require separate stockpiling in accordance with DENR GUIDELINES and proper disposal. Payment for testing, removal, and backfill of contaminated soil shall be issued as a separate Task Order per Bid Schedule.

Additional criteria for bids are as follows:

- a. Surface elevations are as indicated.
- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.
- c. Ground water elevations indicated are those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction. Historical data indicates that ground water elevations vary from 3 feet in the winter to 7 feet in the summer.
- d. If additional backfill and bedding are required, it is not available on Government property.
- e. Hard materials and rock will not be encountered.
- f. Blasting will not be permitted. Remove material in an approved manner.

1.6 REQUIREMENTS FOR OFF SITE SOIL

Soils brought in from off site for use as backfill shall be tested for TPH, BTEX and full TCLP including ignitability, corrosivity and reactivity. Backfill shall contain less than 100 parts per million (ppm) of total petroleum hydrocarbons (TPH) and less than 10 ppm of the sum of Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX) and shall not fail the TCPL test. TPH concentrations shall be determined by using EPA 600/4-79/020 Method 418.1. BTEX concentrations shall be determined by using EPA 530/F-93/004 Method 5030/8020. TCLP shall be performed in accordance with EPA 530/F-93/004 Method 1311. Provide Borrow Site Testing for TPH, BTEX and TCLP from a composite sample of material from the borrow site,

## Replace Steam Piping From MH38 to MH18

with at least one test from each borrow site. Material shall not be brought on site until tests have been approved by the Contracting Officer.

### 1.7 QUALITY ASSURANCE

#### 1.7.1 Shoring and Sheeting Plan

Submit drawings and calculations, certified by a registered professional engineer, describing the methods for shoring and sheeting of excavations. Drawings shall include material sizes and types, arrangement of members, and the sequence and method of installation and removal. Calculations shall include data and references used.

#### 1.7.2 Dewatering Work Plan

Submit procedures for accomplishing dewatering work.

#### 1.7.3 Utilities

Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

## PART 2 PRODUCTS

### 2.1 SOIL MATERIALS

#### 2.1.1 Satisfactory Materials

Any materials classified by ASTM D 2487 as GM, SM, SC free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and deleterious, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location.

#### 2.1.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, and stones larger than 3 inches. The Contracting Officer shall be notified of any contaminated materials.

#### 2.1.3 Common Fill

Approved, unclassified soil material with the characteristics required to compact to the soil density specified for the intended location.

#### 2.1.4 Backfill and Fill Material

ASTM D 2487, classification GM, SM with a maximum ASTM D 4318 liquid limit

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of 35, maximum ASTM D 4318 plasticity index of 12, and a maximum of 25 percent by weight passing ASTM D 1140, No. 200 sieve.

2.1.5 Flowable Backfill

Provide the following materials from an established local ready-mix concrete producer.

| Mix #1<br>Less Flowable |        | Mix #2<br>Very Flowable |        |
|-------------------------|--------|-------------------------|--------|
| Weights                 | Volume | Weights                 | Volume |
| Min. 50 lbs Cement      | 0.25   | Min. 50 lbs Cement      | 0.25   |
| Min. 600 lbs Fly Ash    | 4.24   | Min. 600 lbs Fly Ash    | 4.24   |
| SSD 2500 lbs Sand       | 15.18  | SSD 2500 lbs Sand       | 15.18  |
| 55 Gal 458 lbs Water    | 7.34   | 65 Gal 541 lbs Water    | 8.68   |
| Total Cubic Feet =      | 27.00  | Total Cubic Feet =      | 28.34* |

\*One cubic yard of very flowable fill will be mixed to contain more than 27 cubic feet due to the additional water.

The above values are based on specific gravities - cement 3.15, fly ash 2.27 sand 2.64, and water 1.00. Anticipated unconfined compressive strength is 80 psi at 28 days and 150 psi at 56 days. Adding water to a flowable fill to obtain the design plastic characteristics will not compromise the quality of the hardened flowable fill.

2.2 UTILITY BEDDING MATERIAL

Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Backfill to top of pipe shall be compacted to 95 percent of ASTM D 698 maximum density. Plastic piping shall have bedding to spring line of pipe. Provide ASTM D 2321 materials as follows:

- a. Class I: Angular, 0.25 to 1.5 inches, graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.
- b. Class II: Coarse sands and gravels with maximum particle size of 1.5 inches, including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D 2487.

2.2.1 Sand

Clean, coarse-grained sand classified as SW or SP by ASTM D 2487 for bedding and backfill.

2.2.2 Gravel

Clean, coarsely graded natural gravel, crushed stone or a combination thereof or having a classification of GW or GP in accordance with ASTM D 2487 for bedding and backfill. Maximum particle size shall not exceed 3 inches.

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### 2.3 BORROW

Obtain borrow materials required in excess of those furnished from excavations from sources outside of Government property.

## PART 3 EXECUTION

### 3.1 PROTECTION

#### 3.1.1 Shoring and Sheeting

Provide shoring bracing and sheeting. In addition to Section 25 A and B of COE EM-385-1-1 and other requirements set forth in this contract, include provisions in the shoring and sheeting plan that will accomplish the following:

- a. Prevent undermining of pavements, foundations and slabs.
- b. Prevent slippage or movement in banks or slopes adjacent to the excavation.
- c. Allow for the abandonment of shoring and sheeting materials in place in critical areas as the work is completed. In these areas, backfill the excavation to within 3 feet of the finished grade and remove the remaining exposed portion of the shoring before completing the backfill.

#### 3.1.2 Site Descriptions

Provide for the collection and disposal of surface and subsurface water encountered during construction.

##### 3.1.2.1 Drainage

So that construction operations progress successfully, completely drain construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall establish/construct storm drainage features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, dikes, swales, and other drainage features and equipment as required to maintain dry soils, prevent erosion and undermining of foundations. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained.

##### 3.1.2.2 Dewatering

Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be

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permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, the water level shall be maintained continuously, at least 2 feet below the working level.

### 3.1.3 Underground Utilities

Location of the existing utilities indicated is approximate. The Contractor shall physically verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor shall contact the Contracting Officer for assistance in locating existing utilities. The Contractor shall scan the construction site with electromagnetic and sonic equipment and mark the surface of the ground where existing underground utilities are discovered.

### 3.1.4 Machinery and Equipment

Movement of construction machinery and equipment over pipes during construction shall be at the Contractor's risk. Repair, or remove and provide new pipe for existing or newly installed pipe that has been displaced or damaged.

## 3.2 SURFACE PREPARATION

### 3.2.1 Unsuitable Material

Remove vegetation, debris, decayed vegetable matter, sod, mulch, and rubbish underneath paved areas or concrete slabs.

## 3.3 EXCAVATION

### 3.3.1 Pipe Trenches

Excavate to the dimension indicated. Grade bottom of trenches to provide uniform support for each section of pipe after pipe bedding placement. Tamp if necessary to provide a firm pipe bed. Recesses shall be excavated to accommodate bells and joints so that pipe will be uniformly supported for the entire length. Rock, where encountered, shall be excavated to a depth of at least 6 inches below the bottom of the pipe.

## 3.4 FILLING AND BACKFILLING

Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlaying lift.

### 3.4.1 Backfill and Fill Material Placement Over Pipes and at Walls

Backfilling shall not begin until construction below finish grade has been approved, underground utilities systems have been inspected, tested and approved, forms removed, and the excavation cleaned of trash and debris. Backfill shall be brought to indicated finish grade. Where pipe is coated or wrapped for protection against corrosion, the backfill material up to an elevation 2 feet above sewer lines and 1 foot above other utility lines shall be free from stones larger than 1 inch in any dimension. Heavy equipment for spreading and compacting backfill shall not be operated closer to foundation or retaining walls than a distance equal to the height

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of backfill above the top of footing; the area remaining shall be compacted in layers not more than 4 inches in compacted thickness with power-driven hand tampers suitable for the material being compacted. Backfill shall be placed carefully around pipes or tanks to avoid damage to coatings, wrappings, or tanks. Backfill shall not be placed against foundation walls prior to 7 days after completion of the walls. As far as practicable, backfill shall be brought up evenly on each side of the wall and sloped to drain away from the wall.

### 3.4.2 Trench Backfilling

Backfill as rapidly as construction, testing, and acceptance of work permits. Place and compact backfill under structures and paved areas in 6 inch lifts to top of trench and in 6 inch lifts to one foot over pipe outside structures and paved areas.

### 3.5 BORROW

Where satisfactory materials are not available in sufficient quantity from required excavations, approved borrow materials shall be obtained as specified herein.

### 3.6 COMPACTION

Determine in-place density of existing subgrade; if required density exists, no compaction of existing subgrade will be required.

#### 3.6.1 Paved Areas

Compact top 12 inches of subgrades to 95 percent of ASTM D 698 or ASTM D 1557. Compact fill and backfill materials to 95 percent of ASTM D 698 or ASTM D 1557.

### 3.7 FINISH OPERATIONS

#### 3.7.1 Grading

Finish grades as indicated within one-tenth of one foot. Grade areas to drain water away from structures. Maintain areas free of trash and debris. For existing grades that will remain but which were disturbed by Contractor's operations, grade as directed.

#### 3.7.2 Protection of Surfaces

Protect newly backfilled, graded, and topsoiled areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.

#### 3.7.3 Finishing Flowable Backfill

Finishing shall be accomplished with a square shovel along the edges of the trench if the fill surface is at the bottom of the pavement. The remaining surface shall be smoothed with a wood float to produce a uniform and smooth surface. As an alternative, the hardened flowable fill can be shaped to grade the next day to allow for the patch thickness required by the plans. Full traffic can be allowed onto the flowable fill within eight to twenty hours without damage to the fill or structures below. If it is necessary to return traffic to the surface in less than eight hours or if there is concern that traffic flow will rut the hardening fill, steel plates shall

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be used as soon as it is able to support foot traffic.

### 3.8 DISPOSITION OF SURPLUS MATERIAL

Remove from Government property surplus or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber.

### 3.9 FIELD QUALITY CONTROL

#### 3.9.1 Sampling

Take the number and size of samples required to perform the following tests.

#### 3.9.2 Testing

Perform one of each of the following tests for each material used. Provide additional tests for each source change.

##### 3.9.2.1 Fill and Backfill Material Testing

Test fill and backfill material in accordance with ASTM C 136 for conformance to ASTM D 2487 gradation limits; ASTM D 1140 for material finer than the No. 200 sieve; ASTM D 4318 for liquid limit and for plastic limit; ASTM D 698 or ASTM D 1557 for moisture density relations, as applicable.

##### 3.9.2.2 Density Tests

Test density in accordance with ASTM D 1556, or ASTM D 2922 and ASTM D 3017. When ASTM D 2922 and ASTM D 3017 density tests are used, verify density test results by performing an ASTM D 1556 density test at a location already ASTM D 2922 and ASTM D 3017 tested as specified herein. Perform an ASTM D 1556 density test at the start of the job, and for every 10 ASTM D 2922 and ASTM D 3017 density tests thereafter. Test each lift at randomly selected locations every 2000 square feet of existing grade in fills for structures and concrete slabs, and every 2500 square feet for other fill areas and every 2000 square feet of subgrade in cut. Include density test results in daily report.

- a. Bedding and backfill in trenches: One test per 50 linear feet in each lift.

##### 3.9.2.3 Moisture Content Tests

In the stockpile, excavation or borrow areas, a minimum of two tests per day per type of material or source of materials being placed is required during stable weather conditions. During unstable weather, tests shall be made as dictated by local conditions and approved moisture content shall be tested in accordance with ASTM D 2216. Include moisture content test results in daily report.

-- End of Section --

SECTION 32 92 23

SODDING

04/06

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D 4972 (2001; R 2007) pH of Soils

TURFGRASS PRODUCERS INTERNATIONAL (TPI)

TPI GSS (1995) Guideline Specifications to Turfgrass Sodding

U.S. DEPARTMENT OF AGRICULTURE (USDA)

DOA SSIR 42 (1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.2 DEFINITIONS

1.2.1 Stand of Turf

100 percent ground cover of the established species.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Fertilizer

Include physical characteristics, and recommendations.

SD-06 Test Reports

Topsoil composition tests (reports and recommendations).

SD-07 Certificates

Nursery certification for sods. Indicate type of sod in accordance with TPI GSS.

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### 1.4 DELIVERY, STORAGE, AND HANDLING

#### 1.4.1 Delivery

##### 1.4.1.1 Sod Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

##### 1.4.1.2 Fertilizer Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer may be furnished in bulk with certificate indicating the above information.

#### 1.4.2 Storage

##### 1.4.2.1 Sod Storage

Lightly sprinkle with water, cover with moist burlap, straw, or other approved covering; and protect from exposure to wind and direct sunlight until planted. Provide covering that will allow air to circulate so that internal heat will not develop. Do not store sod longer than 24 hours. Do not store directly on concrete or bituminous surfaces.

##### 1.4.2.2 Topsoil

Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

##### 1.4.2.3 Handling

Do not drop or dump materials from vehicles.

### 1.5 TIME RESTRICTIONS AND PLANTING CONDITIONS

#### 1.5.1 Restrictions

Do not plant when the ground is frozen, muddy, or when air temperature exceeds 90 degrees Fahrenheit.

### 1.6 TIME LIMITATIONS

#### 1.6.1 Sod

Place sod a maximum of thirty six hours after initial harvesting, in accordance with TPI GSS as modified herein.

## PART 2 PRODUCTS

### 2.1 SODS

#### 2.1.1 Classification

Nursery grown, certified as classified in the TPI GSS. Machine cut sod at a uniform thickness of 3/4 inch within a tolerance of 1/4 inch, excluding top growth and thatch. Each individual sod piece shall be strong enough to

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support its own weight when lifted by the ends. Broken pads, irregularly shaped pieces, and torn or uneven ends will be rejected.

2.1.2 Purity

Sod species shall be genetically pure, free of weeds, pests, and disease.

2.1.3 Planting Dates

Sod planting dates for locally available sod shall be based on factors such as climate conditions and availability from local producers. The contractor should keep abreast of factors controlling availability and adjust construction schedules to accommodate these factors. The government shall not be held liable for contractor delays due to shortages or unavailable sources of sod.

2.1.4 Composition

2.1.4.1 Proportion

Proportion grass species as follows.

| Botanical and Common Name | Percent: |
|---------------------------|----------|
| Centipede                 | 100      |

2.2 TOPSOIL

2.2.1 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph entitled "Composition." When available topsoil shall be existing surface soil stripped and stockpiled on-site in accordance with Section 31 23 00.00 20 EXCAVATION AND FILL.

2.2.2 Off-Site Topsoil

Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished by the Contractor.

2.2.3 Composition

Containing from 5 to 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4 inch screen. The pH shall be tested in accordance with ASTM D 4972. Topsoil shall be free of sticks, stones, roots, and other debris and objectionable materials.

2.3 FERTILIZER

2.3.1 Granular Fertilizer

Organic, granular controlled release fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

- 10 percent available nitrogen
- 20 percent available phosphorus

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10 percent available potassium

## 2.4 WATER

Source of water shall be approved by Contracting Officer and of suitable quality for irrigation containing no element toxic to plant life.

## PART 3 EXECUTION

### 3.1 PREPARATION

#### 3.1.1 EXTENT OF WORK

Provide soil preparation (including soil conditioners), fertilizing, and sodding of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

#### 3.1.2 Soil Preparation

Provide 4 inches of off-site topsoil to meet finish grade. After areas have been brought to finish grade, incorporate fertilizer into soil a minimum depth of 4 inches by disking, harrowing, tilling or other method approved by the Contracting Officer. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

### 3.2 SODDING

#### 3.2.1 Finished Grade and Topsoil

Prior to the commencement of the sodding operation, the Contractor shall verify that finished grades are as indicated on drawings; the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 31 23 00.00 20 EXCAVATION AND FILL.

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove from the surface debris and stones over a minimum 5/8 inch in any dimension.

#### 3.2.2 Placing

Place sod a maximum of 36 hours after initial harvesting, in accordance with TPI GSS as modified herein.

#### 3.2.3 Sodding Slopes and Ditches

For slopes 2:1 and greater, lay sod with long edge perpendicular to the contour. For V-ditches and flat bottomed ditches, lay sod with long edge perpendicular to flow of water. On slope areas, start sodding at bottom of the slope.

#### 3.2.4 Finishing

After completing sodding, blend edges of sodded area smoothly into surrounding area. Air pockets shall be eliminated and a true and even surface shall be provided. Frayed edges shall be trimmed and holes and

## Replace Steam Piping From MH38 to MH18

missing corners shall be patched with sod.

### 3.2.5 Rolling

Immediately after sodding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width.

### 3.2.6 Watering

Start watering areas sodded as required by daily temperature and wind conditions. Apply water at a rate sufficient to ensure thorough wetting of soil to minimum depth of 6 inches. Run-off, puddling, and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or plant material shall be prevented.

### 3.3 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use.

### 3.4 RESTORATION

Restore to original condition existing turf areas which have been damaged during turf installation operations. Keep clean at all times at least one paved pedestrian access route and one paved vehicular access route to each building. Clean other paving when work in adjacent areas is complete.

-- End of Section --

SECTION 33 60 01

VALVES, PIPING, AND EQUIPMENT IN VALVE MANHOLES  
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 designations only.

ASTM INTERNATIONAL (ASTM)

|                   |  |
|-------------------|--|
| ASTM A 106        | (2002a) Seamless Carbon Steel Pipe for High-Temperature Service  |
| ASTM A 234/A 234M | (2002) Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service |
| ASTM A 53/A 53M   | (2002) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless                               |
| ASTM A 733        | (2001) Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples                      |
| ASTM B 209        | (2004) Aluminum and Aluminum-Alloy Sheet and Plate   |
| ASTM C 449/C 449M | (2000) Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement                           |
| ASTM C 533        | (2004) Calcium Silicate Block and Pipe Thermal Insulation  |
| ASTM C 552        | (2003) Cellular Glass Thermal Insulation   |
| ASTM C 647        | (1995; R 2000) Properties and Tests of Mastics and Coating Finishes for Thermal Insulation               |
| ASTM D 3278       | (1996e1) Flash Point of Liquids by Small Scale Closed-Cup Apparatus                                      |
| ASTM E 84         | (2004) Surface Burning Characteristics of Building Materials   |
| ASTM E 96         | (2000e1) Water Vapor Transmission of Materials   |
| ASTM F 1139       | (1988; R 1998) for Steam Traps and Drains  |

ASME INTERNATIONAL (ASME)

|              |                                      |
|--------------|--------------------------------------|
| ASME B1.20.1 | (1983; R 2001) Pipe Threads, General |
|--------------|--------------------------------------|

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Purpose, Inch

|                  |  |
|------------------|--|
| ASME B16.9       | (2001) Factory-Made Wrought Steel<br>Buttwelding Fittings                                    |
| ASME B16.11      | (2002) Forged Fittings, Socket-Welding and<br>Threaded                                       |
| ASME B16.34      | (1996) Valves Flanged, Threaded, and<br>Welding End  |
| ASME B31.1       | (2001) Power Piping  |
| ASME BPVC SEC IX | (2001) Boiler and Pressure Vessel Code;<br>Section IX, Welding and Brazing<br>Qualifications |

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS  
INDUSTRY (MSS)

|           |  |
|-----------|--|
| MSS SP-25 | (1998) Standard Marking System for Valves,<br>Fittings, Flanges and Unions |
| MSS SP-45 | (1998) Bypass and Drain Connections  |
| MSS SP-58 | (1993) Pipe Hangers and Supports -<br>Materials, Design and Manufacture    |
| MSS SP-69 | (2002) Pipe Hangers and Supports -<br>Selection and Application            |
| MSS SP-80 | (1997) Bronze Gate, Globe, Angle and Check<br>Valves                       |
| MSS SP-83 | (2001) Class 3000 Steel Pipe Unions<br>Socket-Welding and Threaded         |

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

|          |  |
|----------|--|
| NFPA 90A | (1999) Installation of Air Conditioning<br>and Ventilating Systems |
|----------|--|

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

|               |  |
|---------------|--|
| SSPC Paint 16 | (1982; R 2000) Coal Tar Epoxy-Polyamide<br>Black (or Dark Red) Paint |
| SSPC SP 10    | (2000) Near-White Blast Cleaning                                     |

UNDERWRITERS LABORATORIES (UL)

|        |  |
|--------|--|
| UL 723 | (2003) Test for Surface Burning<br>Characteristics of Building Materials |
|--------|--|

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00  
SUBMITTAL PROCEDURES:

## Replace Steam Piping From MH38 to MH18

### SD-02 Shop Drawings

Detail Drawings; G

Detail drawings, as specified, 45 days after notice to proceed.

### SD-03 Product Data

Piping and Fittings; G

Valves; G

Insulation; G

Manufacturer's descriptive data and technical literature, performance charts, catalog cuts and installation instructions.

### SD-04 Samples

Insulated Sections; G.

Display of insulated sections, as specified, 45 days after notice to proceed.

### SD-10 Operation and Maintenance Data

Valve Manholes and Accessories; G  
Data Package 2; G

Data Package 2 in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

## 1.3 DESCRIPTION

This specification covers valve manholes and the valves and equipment shown in the manholes on the drawings.

### 1.3.1 Detail Drawings

The Contractor shall submit detail drawings for valve manholes and the piping and equipment in the valve manholes, such as steam traps, valves, sump pumps, pressure gauges, thermometers and insulation, including a complete list of equipment and materials, including manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Drawings shall also contain complete wiring and schematic diagrams. Drawings shall show pipe anchors and guides, and layout and anchorage of equipment and appurtenances in valve manholes, and equipment relationship to other parts of the work including clearances for maintenance and operation.

### 1.3.2 Insulated Sections

The Contractor shall submit sample sections for insulation of pipe, elbow, tee, valve, support point, and terminating points. After approval of materials and prior to insulation of piping, a display shall be prepared of insulated sections showing compliance with specifications including showing fastening, sealing, jacketing, straps, waterproofing, supports, hangers, anchors, and saddles. Approved display sample sections shall remain on display at the jobsite during the construction period until no longer

## Replace Steam Piping From MH38 to MH18

needed by Contracting Officer, then removed.

### 1.4 DELIVERY AND STORAGE

All materials and equipment delivered and placed in storage shall be stored with protection from the weather, excessive humidity, and excessive temperature variation; dirt, dust, or other contaminants.

### 1.5 FIELD MEASUREMENTS

The Contractor shall become familiar with all details of the work, verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing the work.

## PART 2 PRODUCTS

### 2.1 STANDARD PRODUCTS

Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Equipment shall be supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site.

### 2.2 NAMEPLATES

Each major item of equipment such as sump pump, motor, steam trap, and pressure reducing valve shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a plate secured to the item of equipment.

### 2.3 ASBESTOS PROHIBITION

Asbestos and asbestos-containing products shall not be used.

### 2.4 PIPING AND FITTINGS

#### 2.4.1 General Requirements

Piping, fittings and piping accessories inside the valve manholes shall conform to the requirements of ASME B31.1 and shall be suitable for the working pressure and temperature requirements of the system. To the greatest extent possible, the piping and fittings inside the valve manholes shall match the piping and fittings located on the outside of the valve manhole. All piping in valve manholes shall be steel with joints welded except that joints 3/4 inch and smaller may be threaded. When threaded joints are used on High Temperature Water Systems, the interface area where the pipe threads meet the threaded fittings shall be seal welded (continuous fillet weld) to preclude any water leakage. No supports, anchors, or stays shall be attached to any piping system in places where either the installation of or the movement of the pipe and its contents will cause damage to the construction.

#### 2.4.2 Steel Pipe

Pipe shall be black steel, seamless or electric-resistance welded, conforming to the requirements of ASTM A 53/A 53M, Grade B or ASTM A 106, Grade B. Pipe up to and including 10 inches in diameter shall be schedule

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40. Condensate piping and piping 3/4 inch in diameter and smaller shall be schedule 80.

### 2.4.2.1 Nipples

Nipples shall conform to ASTM A 733 as required to match adjacent piping.

### 2.4.2.2 Pipe Threads

Pipe threads shall conform to ASME B1.20.1. Pipe threads may be used only on pipe 3/4 inch or smaller. All pipe which is to be threaded shall be schedule 80.

### 2.4.3 Fittings

All fittings, valves, flanges and unions shall have the manufacturer's trademark affixed in accordance with MSS SP-25 so as to permanently identify the manufacturer.

#### 2.4.3.1 Welded Fittings

Welded fittings shall conform to ASTM A 234/A 234M, buttwelded or socket welded, as required to match connecting piping. Buttwelded fittings shall conform to ASME B16.9, and socket welded fittings shall conform to ASME B16.11.

#### 2.4.3.2 Unions

Unions shall conform to MSS SP-83 as required to match adjacent piping.

#### 2.4.4 Insulating Flanges and Dielectric Unions

As specified in Section 26 42 19.00 20, CATHODIC PROTECTION BY IMPRESSED CURRENT.

## 2.5 VALVES

Unless otherwise specified, valves shall comply with the material, fabrication, and operating requirements of ASME B31.1. Valves shall be suitable for the temperature and pressure requirements of the system on which used. Valves for steam shall conform to ASME B31.1 Class 300, as suitable for the application. Valves for condensate services shall conform to ASME B31.1 Class 300. Valves 3/4 inch and smaller may be bronze where seal welding is not required. Valves 6 inches and larger shall have a 1 inch minimum gate or globe bypass valve sized in conformance with MSS SP-45.

### 2.5.1 Steel Valves

Steel globe, gate, angle, and check valves shall conform to the requirements of ASME B16.34 and ASME B31.1 for the temperature and pressure requirements of the system. Gate valves 2-1/2 inches and smaller shall be rising stem. Gate valves 3 inches and larger shall be outside screw and yoke.

### 2.5.2 Bronze Valves

#### 2.5.2.1 Globe, Gate, and Angle Valves

Bronze globe, gate, and angle valves shall conform to requirements of

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MSS SP-80, union bonnet type.

### 2.5.2.2 Check Valves

Bronze check valves shall conform to the requirements of MSS SP-80.

### 2.5.3 Packing

Packing used with valves shall not contain asbestos. Valve stem packing shall be die-formed, ring type specifically designated as suitable for the temperature and pressure of the service and compatible with the fluid in the system. Packing shall be polytetrafluoroethylene with minimum 50 percent graphite filament. Valves 1-1/2 inches and smaller shall have four or five packing rings and valves 2 inches and larger shall have at least six packing rings. Spiral or continuous packing will not be acceptable. A metal insert shall be provided having proper clearance around the valve stem at the bottom of the stuffing box and acting as a base for the packing material. Packing glands shall be furnished with a liner of noncorrosive material and shall be of one piece construction with provisions for not less than two bolts for packing adjustment.

## 2.6 STEAM TRAPS

Class of trap bodies shall be suitable for a working pressure of not less than 1.5 times the steam supply pressure, but not less than 200 psi, and traps shall be capable of operation under a steam-supply pressure as specified. Traps shall fail open.

### 2.6.1 Bucket Traps

Bucket traps shall be inverted-bucket type with automatic air discharge and conform to ASTM F 1139.

## 2.7 STRAINERS

Strainers shall be basket or y-type with connections the same size as the pipe lines in which the connections are installed. The strainer bodies for steam systems shall be heavy and durable, of cast steel, with bottoms drilled and plugged. The strainers shall be suitable for the temperature and pressure requirements of the system on which they are installed. The bodies shall have arrows clearly cast on the sides to indicate the direction of flow. Each strainer shall be equipped with an easily removable cover and sediment basket. The body or bottom opening shall be equipped with nipple and gate valve for blowdown. The basket for steam systems shall be not less than 0.025 inch thick stainless steel, Monel or sheet brass, with small perforations of sufficient number to provide a net free area through the basket of at least 2.5 times that of the entering pipe. The flow shall be into the basket and out through the perforations. For high temperature hot water systems, only cast steel bodies and stainless or Monel baskets shall be used.

## 2.8 INSULATION AND JACKETING

### 2.8.1 General Provisions

All piping, fittings, valves, etc., in the valve manholes shall be insulated. Insulation shall be premolded, precut or job fabricated to fit and shall be removable and reusable. Thickness of insulation shall be in accordance with Tables 1 and 2. Insulation jackets shall be provided for

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all pipe and fitting insulation.

### 2.8.2 Insulation

Insulation for all piping, fittings, and valves shall be molded calcium silicate conforming to ASTM C 533, Type I, or cellular glass insulation conforming to ASTM C 552. All insulation shall be asbestos free. Laminated construction shall not be used unless the thickness exceeds 4 inches. Insulations and the manufacturers approved for use are:

- a. Delta, available from Rockwool in Leeds, Alabama.
- b. MPT-PC and MPT-PF, available from Mineral Products of Texas in Houston, TX.
- c. Thermo-12, Super Caltemp, available from Johns Manville in Denver, Colorado.
- d. Foamglass (cellular glass), available from Pittsburgh Corning Corporation.

### 2.8.3 Aluminum Jackets

Aluminum jackets shall be smooth sheet, 0.016 inch nominal thickness and conform to the requirements of ASTM B 209, Type 3003, 3105, or 5005. Aluminum jackets shall be supplied with a factory installed moisture barrier. This moisture barrier shall consist of at least 40 pound kraft paper coated on one side with a 1 mil thick polyethylene film. The moisture barrier shall be adhered to the aluminum jacket over the entire area of the aluminum jacket insulation-side surface.

### 2.8.4 Bands

Bands for aluminum jacket shall be 3/8 inch wide and 32 gauge thickness made of aluminum or annealed stainless steel. Bands for insulation shall be 1/2 inch wide and 32 gauge thickness made of annealed stainless steel.

### 2.8.5 Insulation for Flanges, Unions, Valves, and Fittings

Flanges, unions, valves, and fittings shall be insulated with premolded prefabricated, or field fabricated segments of insulation of the same material and thickness as the manhole pipe insulation. Insulation shall be removable and reusable and shall have essentially the same thermal characteristics and thickness as the adjoining piping.

### 2.8.6 Vapor Barrier Coating

The vapor barrier coating shall be fire and water resistant and appropriately selected for either outdoor or indoor service. Color shall be white. The water vapor permeance of the compound shall not exceed 0.05 perm and shall be determined according to Procedure B of ASTM E 96. The coating shall be a nonflammable, fire resistant type conforming to ASTM E 84, NFPA 90A and UL 723. The flash point of the compound shall not be less than 80 degrees F and shall be determined in accordance with ASTM D 3278. All other application and service properties shall be in accordance with ASTM C 647.

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### 2.8.7 Finishing Cement

Mineral fiber hydraulic-setting thermal insulating cement in accordance with ASTM C 449/C 449M.

### 2.8.8 Glass Tape

Glass tape shall meet the requirements of UL 723 and ASTM E 84.

## 2.9 CONCRETE VALVE MANHOLES AND ACCESSORIES

### 2.9.1 Pipe Sleeves

Pipe sleeves of sufficient length to pass through valve manhole or building walls shall be provided. Pipe sleeves shall be zinc-coated steel pipe, conforming to the requirement of ASTM A 53/A 53M, Schedule 40 or standard weight. The pipe sleeves shall be secured in the proper position and location during construction of the valve manhole or building wall. For manhole top penetrations, the diameter of the pipe sleeve will be large enough to allow at least 1/4 inch of clearance between the pipe insulation and the sleeve, and, the sleeve will be sized to accommodate the specific mechanical seal size used for the conduit penetration. The space between the sleeve and the pipe casing, and the caulking and sealing materials shall be selected so there shall be NO electrical continuity between the pipe sleeve and the pipe casing when finished.

#### 2.9.1.1 Interlocking Elastomeric Links

A modular mechanical type sealing assembly will be used between the valve manhole pipe sleeve or core-drilled hole and the conduit casing. The mechanical seal shall consist of interlocking elastomeric links shaped to continuously fill the annular space between the casing and sleeve. The link material shall be a synthetic elastomeric capable of withstanding long term exposure at 200 degrees F without deterioration. The links shall be attached to each other with corrosion resistant steel bolts, nuts and pressure plates. The link, bolts, nuts and pressure plates shall be the product of single manufacturer and shall be furnished as the product of single manufacturer and shall be furnished as a package or kit. The links shall be loosely assembled with bolts to form a continuous rubber belt around the casing with a pressure plate under each bolt head and each nut. After the seal assembly is properly positioned in the sleeve, tightening of the bolt shall cause the rubber sealing elements to expand and provide a watertight seal between the casing and the sleeve. The pipe sleeve or core-drilled hole diameter shall be sized so that no more than one half of the seal assembly's expansion capability is used to achieve a water seal.

### 2.9.2 Pipe Supports

Pipe Supports shall be in accordance with MSS SP-58 and MSS SP-69, type as shown. All pipe supports, including structural cross support members, shall be galvanized in accordance with Section 05 50 00 METAL FABRICATIONS. Chains, straps, or single point supports shall not be used.

## 2.10 MISCELLANEOUS METAL

Miscellaneous metal not otherwise specified, shall conform to Section 05 50 00 METAL FABRICATIONS. Miscellaneous metal bolted together, shop welded, or assembled in the field, and pipe supports, including structural cross support members and anchors, shall be hot-dip galvanized in

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accordance with Section 05 50 00 METAL FABRICATIONS.

### PART 3 EXECUTION

#### 3.1 SITE WORK

##### 3.1.1 Excavation, Trenching, and Backfilling

Excavation, trenching, and backfilling of the valve manholes shall be as shown and in accordance with Section 31 23 00.00 20, EXCAVATION AND FILL.

##### 3.1.2 Painting

Steel and iron appurtenances, piping, and supports shall be cleaned in compliance with SSPC SP 10, and painted in accordance with SSPC Paint 16, coal-tar epoxy-polyamide.

#### 3.2 PIPING

##### 3.2.1 General

All piping in valve manholes shall be steel and insulated. Insulation shall be protected with galvanized steel jacket. Pipe shall be accurately cut to measurements established at the site and shall be worked into place without springing or forcing. Pipe and insulation shall clear all openings and equipment. Excessive cutting or other weakening of structural members to facilitate piping installation will not be permitted. Burrs shall be removed from ends of pipe by reaming. Installation shall permit free expansion and contraction without damage to joints or hangers. Piping shall be installed in accordance with ASME B31.1. Joints for piping in valve manholes shall be welded, except joints at traps, strainers, and at valves and piping 3/4 inch and smaller which may be threaded. Flanged joints will be permitted for dielectric isolation only. Supports, anchors, or stays shall not be attached where either expansion or the weight of the pipe will cause damage to permanent construction. The method of attaching supports shall not interfere with the operation of the cathodic protection system.

##### 3.2.2 Welded Joints

Joints between sections of pipe, between sections of pipe and valves, and between sections of pipe and fittings shall be welded except where joints are allowed to be screwed for pipe sizes 3/4 inch and smaller. The welding shall conform to the requirements specified in paragraph WELDING.

##### 3.2.3 Flanged and Threaded Joints

###### 3.2.3.1 Flanged Joints

Flanged joints shall be faced true, provided with gaskets, and made perfectly square and tight. Flanged joints shall be used only for electrical isolation and in other special cases where connected equipment is available with only flanged joints, or when specifically shown on the drawings. Electrically isolated flange joints shall be provided at all connections to or from the heat distribution system and between dissimilar metals.

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### 3.2.3.2 Threaded Joints

Threaded joints shall have graphite or inert filler and oil, graphite compound, or polytetrafluoroethylene tape applied to the male threads only. Unions shall be provided at all screwed valves, strainers and connections to equipment 3/4 inch and smaller. Dielectric unions shall be used at connections of dissimilar metals in 3/4 inch and smaller piping.

### 3.2.4 Reducing Fittings

Eccentric reducers in horizontal runs shall be installed with the straight side down. Changes in horizontal piping sizes shall be made through eccentric reducing fittings.

### 3.2.5 Branch Connections

Branches from mains shall branch off top of mains as indicated or as approved. Connections shall ensure unrestricted circulation, elimination of air pockets, and shall permit the complete drainage of the system. Branch connections may be made with either welding tees or forged branch outlet fittings. Branch outlet fittings where used shall be forged and shall be no larger than two nominal pipe sizes smaller than the main run. Branch outlet fittings shall be reinforced to withstand external strains and designed to withstand full pipe bursting strength.

### 3.2.6 Pipe Supports in Valve Manholes

Horizontal and vertical runs of pipe in valve manholes shall be securely supported.

## 3.3 WELDING

Piping shall be welded in accordance with qualified procedures, using performance qualified welders and welding operators. Procedures and welders shall be qualified in accordance with ASME BPVC SEC IX. Welding procedures qualified by others, and welders and welding operators qualified by another employer may be accepted as permitted by ASME B31.1. The Contracting Officer shall be notified 24 hours in advance of tests and the tests shall be performed at the work site. The welder or welding operator shall apply his assigned symbol near each weld he makes as a permanent record.

## 3.4 INSULATION

The insulation shall be installed so that it will not be damaged by pipe expansion or contraction. Insulation shall not become wet before, during, or after installation. Insulation installed over welds shall be grooved to assure a snug fit. Insulation shall be held in place with stainless steel straps. A minimum of 2 bands shall be installed on each individual length of insulation and maximum spacing shall not exceed 18 inch centers.

### 3.4.1 Installation

Material shall be installed in accordance with published installation instructions of the manufacturer. Insulation materials shall not be applied until piping tests are completed. Prior to application, surfaces shall be thoroughly cleaned of moisture, grease, dirt, rust, and scale, and painted where required.

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3.4.2 Insulation on Pipes Passing Through Sleeves

Insulation shall be continuous, as required by paragraph Pipe Sleeves Through Valve Manhole Cover. Aluminum jackets shall be provided over the insulation. When penetrating valve manhole walls, aluminum jacket shall extend not less than 2 inches beyond the sleeve on each side of the wall and shall be secured with an aluminum band on each side of the wall. Where flashing is provided, the jacket shall be secured with not less than one band located not more than 1 inch from the end of the jacket. When penetrating valve manhole tops, pipe shall be insulated as required for valve manhole service as indicated.

3.4.3 Covering of Insulation in Valve Manholes

The insulation for pipe, flanges, valves, and fittings shall be covered with galvanized steel jackets.

3.4.4 Insulation of Piping Accessories in Valve Manholes

Flanges, couplings, unions, valves, fittings, and other pipe accessories, unless otherwise shown or approved, shall be insulated with removable and reusable factory premolded, prefabricated, or field fabricated insulation. For accessories in valve manholes, galvanized steel sheet shall be applied over the insulation. Where accessories are designated not to be insulated, the adjoining insulation and jacket shall terminate neatly. The terminations for the chilled water systems shall provide a complete vapor seal.

3.4.5 Insulation Thickness

The minimum thickness of insulation for the heat distribution system and condensate return system shall be in accordance with Tables 1 and 2.

TABLE 1  
Minimum Pipe Insulation Thickness (In inches)

For steam (16 to 408 psig)

| Nominal<br>Pipe<br>Diameter<br>(inches) | MPT-PC<br>MPT-PF | Delta | Thermo-12<br>Super<br>Caltemp | Foamglass |
|---|------------------|-------|-------------------------------|-----------|
| 1.0                                     | 2.0              | 2.5   | 4.0                           | 4.5       |
| 1.5                                     | 2.0              | 2.5   | 4.0                           | 4.5       |
| 2.0                                     | 2.5              | 3.5   | 4.5                           | 5.0       |
| 2.5                                     | 2.5              | 3.5   | 4.5                           | 5.0       |
| 3.0                                     | 3.0              | 4.0   | 5.0                           | 6.0       |
| 4.0                                     | 3.0              | 4.0   | 5.0                           | 6.0       |
| 5.0                                     | 3.0              | 4.0   | 5.0                           | 6.0       |
| 6.0                                     | 3.5              | 4.5   | 5.5                           | 6.0       |
| 8.0                                     | 3.5              | 4.5   | 5.5                           | 6.0       |
| 10.0                                    | 4.0              | 5.0   | 6.0                           | 6.5       |
| 12.0                                    | 4.0              | 5.0   | 6.0                           | 6.5       |
| 14.0                                    | 4.0              | 5.0   | 6.0                           | 6.5       |
| 16.0                                    | 4.0              | 5.0   | 6.0                           | 6.5       |
| 18.0                                    | 4.0              | 5.0   | 6.0                           | 6.5       |

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| Nominal<br>Pipe<br>Diameter<br>(inches) | MPT-PC<br>MPT-PF | Delta | Thermo-12<br>Super<br>Caltemp | Foamglass |
|---|------------------|-------|-------------------------------|-----------|
|---|------------------|-------|-------------------------------|-----------|

TABLE 2  
Minimum Pipe Insulation Thickness (In inches)  
For Condensate Return

| Nominal<br>Pipe<br>Diameter<br>(inches) | MPT-PC<br>MPT-PF | Delta | Thermo-12<br>Super<br>Caltemp | Foamglass |
|---|------------------|-------|-------------------------------|-----------|
| 1.0                                     | 1.5              | 2.0   | 3.0                           | 3.0       |
| 1.5                                     | 1.5              | 2.0   | 3.0                           | 3.0       |
| 2.0                                     | 1.5              | 2.0   | 3.0                           | 3.0       |
| 2.5                                     | 1.5              | 2.0   | 3.0                           | 3.0       |
| 3.0                                     | 2.0              | 2.5   | 3.5                           | 3.5       |
| 4.0                                     | 2.0              | 2.5   | 3.5                           | 3.5       |
| 5.0                                     | 2.0              | 2.5   | 3.5                           | 3.5       |
| 6.0                                     | 2.5              | 3.0   | 4.5                           | 4.5       |
| 8.0                                     | 2.5              | 3.0   | 4.5                           | 4.5       |
| 10.0                                    | 3.0              | 4.0   | 5.0                           | 5.0       |
| 12.0                                    | 3.0              | 4.0   | 5.0                           | 5.0       |
| 14.0                                    | 3.0              | 4.0   | 5.0                           | 5.0       |
| 16.0                                    | 3.0              | 4.0   | 5.0                           | 5.0       |
| 18.0                                    | 3.0              | 4.0   | 5.0                           | 5.0       |

3.5 VALVE MANHOLES AND ACCESSORIES

3.5.1 Piping and Equipment in Valve Manholes

Piping and equipment in valve manholes shall be installed to provide easy access without stepping on piping or equipment, and to provide sufficient working room. Piping and equipment in valve manholes shall be installed and supported as shown on the drawings. All globe, angle and gate valves shall be installed with the stems horizontal or above. The Contractor shall submit Data Package 2 as related to all equipment provided for the project.

3.6 TESTS

Tests of piping in the valve manholes will be performed as part of the testing of the direct buried conduit system. These tests shall include the piping in the valve manhole and shall be in accordance with the system supplier's Approved Brochure or the contract specifications.

-- End of Section --

SECTION 33 63 13

EXTERIOR UNDERGROUND STEAM DISTRIBUTION SYSTEM

08/04

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS  
(AASHTO)

AASHTO M 300 (2003) Inorganic Zinc Rich Primer

ASME INTERNATIONAL (ASME)

ASME B16.11 (2002) Forged Fittings, Socket-Welding and Threaded

ASME B16.9 (2001) Factory-Made Wrought Steel Buttwelding Fittings

ASME B31.1 (2001) Power Piping

ASME B40.1 (1991) Gauges - Pressure Indicating Dial Type - Elastic Element

ASTM INTERNATIONAL (ASTM)

ASTM A 106 (2002a) Seamless Carbon Steel Pipe for High-Temperature Service

ASTM A 134 (1996; R 2001) Pipe, Steel, Electric-Fusion (Arc)-Welded (Sizes NPS 16 and Over)

ASTM A 135 (2001) Electric-Resistance-Welded Steel Pipe

ASTM A 139 (2000) Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)

ASTM A 167 (2004) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

ASTM A 234/A 234M (2002) Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

ASTM A 36/A 36M (2004) Carbon Structural Steel

ASTM A 53/A 53M (2002) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

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ASTM D 2487 (2000) Soils for Engineering Purposes  
(Unified Soil Classification System)

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS L-S-125 (Rev B) Screening, Insect, Nonmetallic

1.2 DEFINITIONS

The following definitions are applicable:

1.2.1 Pre-engineered System

A complete underground heat distribution and condensate return system including all required components such as carrier pipes, steam pipe and condensate return pipe, fittings, anchors, pipe supports, insulation, protective casing, and cathodic protection, for the system supplied. The pre-engineered system does not include valve manholes and the piping and equipment inside the valve manholes; see Section 33 60 01 VALVE MANHOLES AND PIPING AND EQUIPMENT IN VALVE MANHOLES. The pre-engineered system shall include all piping and components to a point at least six inches inside the building and valve manhole. The UHDS shall not use any part of the building or valve manhole structure as an anchor point.

1.2.2 Direct-Buried

A system which is buried without the need for a field-fabricated protective enclosure such as a concrete trench or tunnel.

1.2.3 UHDS Types

1.2.3.1 Drainable-Dryable-Testable (DDT) Direct-Buried System

A factory-fabricated system including an air and water-tight outer protective casing, air space and an insulated carrier pipe. Drains and vents are provided at the end plates of the system (in manholes or buildings). The drains are normally plugged but the plugs can be removed to drain water which may leak into the air space if there is a failure in the casing or the carrier pipe. The vents allow water vapor to escape and provide a tell-tale sign of leakage.

1.2.4 UHDS Manufacturer Certification

The UHDS manufacturer is the company responsible for the design and manufacture of the pre-engineered system. The UHDS manufacturer directs the installation of their system and has a representative on the job site. Certification includes that the UHDS manufacturer regularly and currently manufactures direct-buried systems, and that the designs of the system and equipment to be provided for this project conform to specification requirements. This certification shall be an original signed by a principal officer of the UHDS manufacturer and shall be submitted at minimum of 2 weeks prior to start of work.

1.2.5 UHDS Manufacturer's Representative

The UHDS manufacturer's representative shall be a person who regularly performs the duties specified herein, is certified in writing by the UHDS manufacturer to be technically qualified and experienced in the

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installation of the system, and shall be authorized by the manufacturer to make and sign the daily reports specified herein.

### 1.2.6 Pipe-Stress and System Expansion Calculations

Pipe-stress and system-expansion calculations for each expansion compensation elbow using a finite element computer generated three-dimensional analysis, not later than 7 days after notice to proceed.

Calculations (including heat loss calculations) shall demonstrate that pipe stresses from temperature changes are within the allowable requirements in ASME B31.1 and the anchors and the guides will withstand the resultant forces. Submitted detailed design layout drawings including the location of all anchors and guides. Layout shall also include all analysis node points. As a minimum, the computer analysis results include node stresses, forces, moments and displacements. Calculations shall be approved, certified, stamped and signed by a registered Professional Engineer in the employ of the UHDS manufacturer.

### 1.2.7 Manufacturer's Data Sheets

Manufacturer's data sheets on all components of the UHDS and the instrumentation required for thermal performance testing.

Manufacturer's data sheets for all coatings and for carrier pipe insulation, indicate thicknesses not later than 7 days after notice to proceed.

### 1.2.8 Work Plan

A proposed schedule of activities indicating when various items of work and tests are to be carried out and when the representative of the UHDS manufacturer shall be present at job site. The UHDS manufacturer shall submit a list of what characteristics shall be considered damaged or defective materials that must be replaced.

### 1.2.9 Quality Assurance Plan

Manufacturer's quality assurance plan for fabrication, delivery, storage, installation and testing of system.

### 1.2.10 Certificate of Compliance

Upon completion of the work, and before final acceptance, a notarized statement signed by a principal officer of both the UHDS manufacturer and the contractor, certifying that the system has been installed satisfactorily and in accordance with the contract drawings, specifications, UHDS manufacturer's detailed design layout drawings and with the UHDS manufacturer's recommendations.

### 1.2.11 Testing Firm Qualification

A Certificate of the Testing Firm Qualification from the independent testing firm or firms, not later than 30 days after notice to proceed, certifying that: weld examination methods and procedures, and the interpretation of radiographic films will be performed in accordance with ASME B31.1; the firm intends to utilize the proper film exposure, techniques, and penetrometer to produce density and geometric sharpness in sufficient clarity to determine presence of defects; and that all

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radiographic films will be reviewed and interpreted, and reading reports signed, by not less than a Certified American Society for Nondestructive Testing Level III Radiographer.

### 1.2.12 Welds

A Certification of Acceptability of all welds made in the field, upon completion of the project. This certification shall consist of a letter signed by an official of the independent testing firm or firms examining welds, stating that all provisions of this specification have been complied with.

### 1.2.13 Daily Written Report

A daily written report from the representative of the UHDS manufacturer whenever the representative is required to be on the jobsite. The report shall be checked for accuracy and the original shall be submitted no later than the next working day after the date of the report. One copy shall be forwarded to the UHDS manufacturer's main office. The report shall be signed by the representative. The report shall state whether or not the condition and quality of the materials and methods used and the installation of the system are in accordance with the contract drawings, specifications, and the UHDS manufacturers detailed design layout drawings and requirements. If anything connected with the installation is unsatisfactory, the report shall state what corrective action has been taken or shall contain the UHDS manufacturer's recommendations for corrective action and when the unsatisfactory condition is to be corrected. The daily report will track and report all unsatisfactory conditions and corrective measured being taken. The report shall identify any conditions that could result in an unsatisfactory installation, including such items as open conduit ends left in the trench overnight and improper valve manhole entries and changes required to the UHDS design due to interferences or conflicts, upon realization of interferences or conflicts. On a weekly basis the daily reports shall be reviewed, approved, signed and sealed by the registered Professional Engineer responsible for the system design and shall be submitted to the Contracting Officer.

### 1.2.14 Heat Distribution System, Data Package 2

The operation and maintenance manual for the heat distribution system shall list routine maintenance procedures, possible breakdowns and repairs, procedures for recording conduit temperatures biannually, and troubleshooting guides. Manual shall include as-built piping layout of the system including final elevations. Submit in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

## 1.3 DESCRIPTION

### 1.3.1 Scope

The work includes the design and fabrication; furnishing; installing, and testing of a direct buried underground insulated steam pipe and insulated steel condensate return pipe consisting of piping as indicated, cathodic protection system (where required by this specification), together with all fittings and appurtenances necessary for a complete and operable system. Gland type end seals shall not be permitted. Drainable, dryable, testable (DDT) systems with fiberglass casings shall not be provided.

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### 1.3.2 UHDS Design

The UHDS manufacturer shall be responsible for the complete design of the UHDS, the product to be supplied, fabrication, witnessing installation and testing of the system within the design parameters established by the contract drawings and specifications, and in compliance with the detailed design. The complete design of the UHDS shall be sealed by a Professional Engineer in the employ of the UHDS manufacturer. A Certificate of Satisfactory Operation shall be submitted certifying that at least 3 systems installed by the UHDS manufacturer within the previous 10 years have and are operating satisfactorily for not less than 5 years, not later than 30 days after notice to proceed. The certificate shall indicate the location, type of system, size of system, point of contact (POC) including phone number, for information verification. This certificate of satisfactory operation shall be an original signed by a principal officer of the UHDS manufacturer.

### 1.3.3 Contract Drawings

The contract drawings accompanying this specification provide information on:

- a. The size of carrier pipes, approximate length, and site location of the system.
- b. The routing and elevation of the piping along the route.
- c. Location and design of manholes.
- d. The obstacles that must be avoided along the path.
- e. Location of piping anchors (anchors will be no closer than 3 feet nor further than 5 feet from entrance to manholes and buildings) at manholes and/or buildings. The UHDS manufacturer shall incorporate any additional anchors as needed for their system.
- f. Operating pressure and temperature of system.

## 1.4 SYSTEM REQUIREMENTS

### 1.4.1 Operating Characteristics

The steam supply system shall have an operating temperature of 350 degrees F and an operating pressure of 100 psig. Condensate return system shall have an operating temperature of 200 degrees F and an operating pressure of 40 psig.

### 1.4.2 Rated Characteristics

All thermal expansion calculations shall be computed for the supply and return piping using the following design characteristics and installation temperature. The system design conditions for steam and condensate supply and/or return at a temperature of 350 degrees F and a pressure of 665 psig. For calculation purposes the installation temperature (the ambient temperature at the site) shall be no higher than a temperature of 56 degrees F.

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### 1.4.3 Heat Distribution System design

A complete description of the Heat Distribution System design and assembly of the system, materials of construction and field installation instructions minimum of 2 days prior to the start of field measurements. Also submittal shall include sufficient system details required to show that the specified minimum insulation thickness has been met. A detailed design layout of the system (plan and elevation views) showing size, type, elevations and location of each component to be used in the system, the design and location of anchors, pipe guides, pipe supports, expansion loops, Z-bends, L-bends, end seals, leak plates, joint locations, pipe and insulation thickness and sizes, types, and movements, connection to manhole and building wall penetrations, and including, if applicable, transition point design to aboveground or other type systems. Also, if applicable, type and details of the cathodic protection system to be used. Detailed design layout drawings shall be prepared and approved by a registered Professional Engineer as certified by their stamp.

### 1.5 STANDARD PRODUCTS

Approval by Contracting Officer is required for products or services of the UHDS manufacturer. The design of the system and equipment provided for this project shall conform to specification requirements, shall be of current production and shall essentially duplicate systems that have been in satisfactory use for at least 5 years, prior to bid opening, at three locations. The systems must have been operated under pressure, temperature and site characteristics that are equal to or more severe than the operating conditions in this specification and must have distributed the same medium. The system shall be supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site.

### 1.6 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Heat Distribution System design; G

SD-03 Product Data

Pipe; G

Insulation; G

Fittings; G

Anchors; G

Coatings; G

Conduit; G

Field Connection of Casing Sections; G

SD-05 Design Data

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Pipe-stress and system expansion calculations; G

Cathodic protection system calculations; G

Manufacturer's data sheets; G

SD-07 Certificates

Work plan; G

Quality assurance; G

UHDS manufacturer certification; G

UHDS design; G

Certificate of compliance; G

Testing firm qualification; G

Welds; G

SD-10 Operation and Maintenance Data; G

Heat distribution system, Data Package 2; G

Submit operation and maintenance data in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

SD-11 Closeout Submittals

Daily written report; G

1.7 SITE CLASSIFICATION

Classification of the site conditions for the UHDS was based on ASTM D 2487 and the following criteria:

TABLE A  
SITE CLASSIFICATION DEFINITION  
BASED ON KNOWN UNDERGROUND WATER CONDITIONS

| Site Classification | General Conditions for Classification   |
|---------------------|---|
| Bad                 | The water table is expected to be occasionally above the bottom of the system and surface water is expected to accumulate and remain for short periods (or not at all) in the soil surrounding the system |
|                     | OR  |
|                     | The water table is expected never to be above the bottom of the system but surface water is expected to accumulate and remain for short periods in the soil surrounding the system.                       |

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PART 2 PRODUCTS

2.1 FACTORY FABRICATED, DIRECT-BURIED, DRAINABLE, DRYABLE, TESTABLE (DDT) SYSTEMS

2.1.1 DDT Steam and High Temperature Hot Water Carrier Pipes

Requirements shall be in accordance with the "Heat Distribution Piping" paragraph.

2.1.2 DDT Condensate Carrier Pipes

Carrier piping for condensate return systems shall be steel, schedule 80. Pipe requirements shall be in accordance with the "Heat Distribution Piping" paragraph.

Do not locate condensate pipes in conduit casings which contain steam pipes or any other piping.

2.1.3 DDT Carrier Pipe Insulation

Carrier pipe insulation shall conform to minimum thicknesses and type listed in Tables 1 and 2 as required for temperature in carrier pipe specified under the "Rated Conditions" paragraph.

2.1.4 Insulation Banding and Scrim

Stainless steel bands and clips, at least 0.5 inches wide, ASTM A 167 (304 stainless steel), maximum spacing 18 inches shall be used over the scrim to secure the insulation onto the carrier pipe. A minimum of two bands are required for each 4 foot section of insulation. Vinyl-coated fiberglass scrim, FS L-S-125, Type II, Class 2, with 18 x 16 mesh (number of filaments per inch) and made of 0.013 inch diameter vinyl-coated fibrous glass yarn. Bands are used over the scrim to secure the insulation onto the carrier pipe.

2.1.5 Casing

Smooth-wall steel, electric resistance spiral welded, conforming to ASTM A 134, ASTM A 135, or ASTM A 139 and the values tabulated below. Provide eccentric connectors as necessary between casing sections to provide drainage of casing section between manholes and between manholes and buildings.

| Casing Diameter (in.) | Minimum Thickness (in.) |
|-----------------------|-------------------------|
| 6 - 26                | 0.250                   |
| 27 - 36               | 0.250                   |
| 37 - 42               | 0.250                   |
| 46                    | 0.250                   |

2.1.6 Casing End Plates, Vents, and Drains

End plates shall be made of ASTM A 36/A 36M steel, minimum thickness 0.5 inches for conduit pipe sizes above 12 inches and 0.375 inches for conduit pipe sizes 12 inches and less. Provide 1 inch ASTM A 53/A 53M, Schedule 40, galvanized vent riser pipe on end plate vent opening. Vent pipe shall extend to top of manhole and terminate with a mushroom vent as indicated. Provide one inch drain at the bottom and vent at the top. Construct with

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welded steel half coupling welded to the end plate, and brass plugs. Plug drains, do not plug vents.

### 2.1.7 Air Space

Provide continuous one inch minimum air space between carrier pipe insulation and casing.

### 2.1.8 Casing Coating

Fusion-bonded epoxy, minimum thickness 0.040 inches. Rated by coating manufacturer for continuous service for at least 25 years at temperatures of 230 degrees F and having a coefficient of expansion similar to that of steel. Coating shall be applied in accordance with the coating manufacturer's instructions. Factory-inspect for holidays and make repairs as necessary.

### 2.1.9 Coating of End Plates and conduit Sections Extending in Manholes

Zinc-rich coating that conforms to AASHTO M 300, Type IA except that volatile organic compounds shall not exceed 2.8 pounds per gallon. The zinc rich coating shall be applied in accordance with the coating manufacturer's requirements including surface preparation. No additional top coat shall be applied.

### 2.1.10 Carrier Pipe Guides

Maximum spacing 10 feet on centers, no more than 5 feet from pipe ends, minimum of three guides per elbow section. Guides shall be designed to allow thermal expansion without damage, provide proper pipe guiding, and to allow horizontal movement in two directions as required at expansion loops and bends. Design of supports shall permit flow of water and air vapor through the support. Pipe insulation shall extend thru the pipe guides and be protected by steel sleeves. Design of guides shall be such that no metal to metal contact exists between the casing and the carrier pipe. Insulation or non-metallic material used to ensure no metal to metal contact shall be designed to not be compressed by the weight of the carrier pipe when full of water.

### 2.1.11 Anchor Plates

Anchor plate shall be ASTM A 36/A 36M steel, welded to carrier pipe and casing, 0.5 inches minimum thickness and shall include, passages for air flow and water drainage through the annular air space in the system. Exterior surface of the anchor plate shall be coated with the same coating material as the casing.

### 2.1.12 Field Connection of Casing Sections

Steel section conforming to casing specification, welded to casing sections, coated on all surfaces with UHDS manufacturer's coating field repair compound, and covered with a 0.05 inch minimum thickness polyethylene shrink sleeve designed for a service temperature exceeding 167 degrees F.

### 2.1.13 Manufacturer's Identification

Provide embossed brass or stainless steel tag hung by brass or stainless steel chain at each end of each conduit or insulated piping in the manholes

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and buildings. The tag shall identify UHDS manufacturer's name, date of installation, Government contract, and manufacturer's project number.

2.2 PIPE INSULATION FOR DIRECT BURIED HEAT DISTRIBUTION SYSTEMS

Materials containing asbestos are not permitted.

2.2.1 Insulation Thickness

The minimum thickness of insulation for the heat distribution system shall be in accordance with Tables 1 and 2 in which the insulations listed have passed the 96 hour boiling water test.

TABLE 1  
MINIMUM PIPE INSULATION THICKNESS (inches)

For Steam (16 to 408 psig)

INSULATIONS  
For Drainable/Dryable Systems

| Nominal Pipe Diameter (inches) | INSULATIONS |          |                                  |
|--------------------------------|-------------|----------|----------------------------------|
|                                | Paroc Delta | Epitherm | Kaylo-10 Thermo-12 Super Caltemp |
| 1.0                            | 2.0         | 2.5      | 4.0                              |
| 1.5                            | 2.0         | 2.5      | 4.0                              |
| 2.0                            | 2.5         | 3.5      | 4.5                              |
| 2.5                            | 2.5         | 3.5      | 4.5                              |
| 3.0                            | 3.0         | 4.0      | 5.0                              |
| 4.0                            | 3.0         | 4.0      | 5.0                              |
| 5.0                            | 3.0         | 4.0      | 5.0                              |
| 6.0                            | 3.5         | 4.5      | 5.5                              |
| 8.0                            | 3.5         | 4.5      | 5.5                              |
| 10.0                           | 4.0         | 5.0      | 6.0                              |
| 12.0                           | 4.0         | 5.0      | 6.0                              |
| 14.0                           | 4.0         | 5.0      | 6.0                              |
| 16.0                           | 4.0         | 5.0      | 6.0                              |
| 18.0                           | 4.0         | 5.0      | 6.0                              |

TABLE 2  
MINIMUM PIPE INSULATION THICKNESS (inches)  
CONDENSATE RETURN

| Nominal Pipe Diameter (inches) | INSULATIONS |          |                                  |              |
|--------------------------------|-------------|----------|----------------------------------|--------------|
|                                | Paroc       | Epitherm | Kaylo-10 Thermo-12 Super Caltemp | Polyurethane |
| 1.0                            | 1.5         | 2.0      | 3.0                              | N/A          |
| 1.5                            | 1.5         | 2.0      | 3.0                              | N/A          |
| 2.0                            | 1.5         | 2.0      | 3.0                              | 0.77         |
| 2.5                            | 1.5         | 2.0      | 3.0                              | N/A          |
| 3.0                            | 2.0         | 2.5      | 3.5                              | 1.05         |
| 4.0                            | 2.0         | 2.5      | 3.5                              | 1.05         |
| 5.0                            | 2.0         | 2.5      | 3.5                              | N/A          |

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TABLE 2  
 MINIMUM PIPE INSULATION THICKNESS (inches)  
 CONDENSATE RETURN

| Nominal Pipe Diameter (inches) | Kaylo-10 |          |                         |              |
|--------------------------------|----------|----------|-------------------------|--------------|
|                                | Paroc    | Epitherm | Thermo-12 Super Caltemp | Polyurethane |
| 6.0                            | 2.5      | 3.0      | 4.5                     | 1.32         |
| 8.0                            | 2.5      | 3.0      | 4.5                     | N/A          |
| 10.0                           | 3.0      | 4.0      | 5.0                     | N/A          |
| 12.0                           | 3.0      | 4.0      | 5.0                     | N/A          |
| 14.0                           | 3.0      | 4.0      | 5.0                     | N/A          |
| 16.0                           | 3.0      | 4.0      | 5.0                     | N/A          |
| 18.0                           | 3.0      | 4.0      | 5.0                     | N/A          |

2.3 HEAT DISTRIBUTION PIPING

2.3.1 Steam Pipe

Pipe material shall be steel; seamless, ASTM A 53/A 53M, Grade B or ASTM A 106, Grade B; or electric resistance welded ASTM A 53/A 53M, Grade B; Schedule 40. Standard weight permitted for pipe sizes 12 inches and above. ASTM A 53/A 53M, Type F furnace butt welded pipe is not allowed. No joints shall be allowed in the factory fabricated straight section of the carrier pipe. Factory fabricated piping sections as part of an expansion loop or bend shall have all welded joints 100 percent radiographed inspected in accordance with ASME B31.1.

2.3.1.1 Condensate Pipe

Steel; seamless, ASTM A 53/A 53M, Grade B or ASTM A 106, Grade B, schedule 80; electric resistance welded ASTM A 53/A 53M, Grade B; Schedule 80. ASTM A 53/A 53M, Type F furnace butt welded pipe is not allowed. No joints shall be allowed in the factory fabricated straight section of the carrier pipe. Factory fabricated piping sections as part of an expansion loop or bend shall have all welded joints 100 percent radiographed inspected in accordance with ASME B31.1. Radiographs shall be reviewed and interpreted by an ASNT Certified Level II radiographer, employed by the testing firm, who shall sign the reading report.

2.3.1.2 Joints

Joints shall be butt-weld except socket-weld joints are permitted for pipe sizes 2 inches and smaller. Dye penetrant inspection may be used in place of 100 percent radiographic inspection for pipe sizes 2 inches and below. Indicate location and elevation of all field joints on detailed design layout drawings. Split-ring welding rings may be used.

2.3.2 Fittings

All welds in factory fittings shall be 100 percent radiographic inspected. All radiographs shall be reviewed and interpreted by a Certified ASNT Level III radiographer, employed by the testing firm, who shall sign the reading report. The Contracting Officer reserves the right to review all inspection records, and if any welds inspected are found unacceptable in accordance with ASME B31.1, the fitting shall be removed, replaced, and

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radiographically reexamined at no cost to the government.

### 2.3.2.1 Butt-Welded

Steel, ASTM A 234/A 234M, Grade B, ASME B16.9, same schedule as adjoining pipe. All elbows shall be long radius unless otherwise indicated. Tees shall be full size or reducing as required, having interior surfaces smoothly contoured. Split-ring welding rings may be used.

### 2.3.2.2 Socket-Welded

Forged steel, ASME B16.11, 2000 pound class will be used for pipe sizes 2 inch and below.

## 2.4 LOOPS AND BENDS

Stresses shall be less than the maximum allowable stress from the Power Piping Code (ASME B31.1). Submit detailed design layout drawings and stress and anchor force calculations for all loops and bends. Show locations of all anchors, guides and supports. Base the calculations on rated characteristics (pressures and temperatures), specified herein, for both the supply and return lines.

## PART 3 EXECUTION

### 3.1 GENERAL

#### 3.1.1 UHDS Design

The UHDS manufacturer is responsible for the complete design of the UHDS, the product to be supplied, fabrication, witnessing installation and testing of the system within the design parameters established by the contract drawings and specifications and in compliance with the detailed design. The complete design of the UHDS shall be prepared, signed, and sealed by a Professional Engineer in the employ of the UHDS manufacturer.

#### 3.1.2 Installation, Inspection, and Testing

The pre-engineered system shall be installed, inspected, and tested in accordance with the contract drawings and specifications, the UHDS manufacturer's standard procedures, detailed design layout drawings and any directions given by the UHDS manufacturer's representative. All work described in paragraph "UHDS Manufacturer's Representative's Responsibilities" shall be performed in the presence of the UHDS manufacturer's representative.

#### 3.1.3 Job Conditions

Phasing of demolition and construction shall be in accordance with the provisions of Section 01110 SUMMARY OF WORK, and as shown on contract drawings.

#### 3.1.4 Interruption of Existing Service

The contractor shall arrange, phase and perform work and provide temporary facilities, materials, equipment, and connections to utilities, to assure adequate heat distribution service for existing installations at all times. Only such absolutely necessary interruptions as may be required for making connections shall be permitted, and only at such times when approval

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is obtained from the Contracting Officer. Interruptions to heat distribution service shall be only with prior approval, and be the minimum possible duration. All interruptions shall be between the hours of 10:00 pm thru 5:00 am as approved by the Contracting Officer.

### 3.1.5 Connecting to Existing Work

Connect new work to existing work in a neat and workmanlike manner. Connection shall be made in manholes and at a point underground as indicated on the contract drawings. Where an existing structure must be cut or existing utilities interfere, such obstruction shall be bypassed, removed, replaced or relocated, restored and repaired. Any changes required to the UHDS design as a result of interferences or conflicts must be approved by the UHDS designer and the Contracting Officer. Work disturbed or damaged shall be replaced to its prior condition, as required by Section 01110 SUMMARY OF WORK.

### 3.1.6 Coordination

Coordinate the location of all items of equipment and work of all trades. Maintain operability and maintainability of the equipment and systems. Any relocation of equipment or systems to comply with the requirement of operability and maintainability shall be performed by the contractor at his cost.

### 3.1.7 Grading

Unless otherwise shown on the contract drawings or the detailed design layout drawings, steam/condensate lines shall be graded uniformly downward not less than 5.0 inches in 100 feet to the lower point of entry between manholes and/or building entries.

### 3.1.8 Variations

Any variations from the approved detailed design layout drawings must be submitted to the Contracting Officer for approval. Variations must be signed and sealed by the UHDS manufacturers' professional engineer responsible for the complete design of the UHDS.

### 3.1.9 Storage and Handling

Equipment and material placed on the job shall remain in the custody of the Contractor until final acceptance whether or not the Contractor has been reimbursed for the equipment and material by the Government.

The Contractor is solely responsible for the protection of the equipment and material against damage from any source. Protect all materials against entry of water and mud by installing watertight protection on open ends at all times. Sections of the casing or carrier piping found to have been subjected to full or partial submergence in water (which would allow the insulation to become wet) shall be immediately replaced. Protect materials at all times while stored or during installation from damage from UV light. Materials awaiting installation shall be completely covered to protect from UV degradation.

Place all damaged items in new operating condition or replace damaged items as determined and directed by the Contracting Officer, at no additional cost to the Government.

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### 3.2 DEMOLITION

Perform work in accordance with requirements for phasing. Completely remove all pipe, valves, fittings, insulation, and all hangers including the connection to the structure and any fastenings. Seal all openings in manhole or building walls after removal of piping. All material and equipment removed shall become the property of the Contractor and shall be removed from Government property within one week and shall not be stored in operating areas. All flame cutting shall be performed with adequate fire protection facilities available as required by safety codes and Contracting Officer.

### 3.3 PIPE, PIPING JOINTS AND FITTINGS

#### 3.3.1 Welded Joints

Clean pipe and fittings inside and outside before and after assembly. Remove all dirt, scale, and other foreign matter from inside the piping by use of a pipe swab or pipe pig before connecting pipe sections, valves, equipment or fittings. Use eccentric connectors as necessary between casing sections to provide drainage of casing section between manholes and between manholes and buildings.

#### 3.3.2 Fittings

All changes in direction shall be made with factory-built reinforced fittings. Field-fabricated fittings and miters are not permitted.

### 3.4 WELDING

The Contractor is entirely responsible for the quality of the welding and shall:

- a. Conduct tests of the welding procedures used by his organization, determine the suitability of the procedures used, determine that the welds made shall meet the required tests, and also determine that the welding operators have the ability to make sound welds under standard conditions.
- b. Comply with ASME B31.1.
- c. Perform all welding operations required for construction and installation of the heat distribution system.

#### 3.4.1 Qualification of Welders

Rules of procedure for qualification of all welders and general requirements for fusion welding shall conform with the applicable portions of ASME B31.1 and also as outlined below.

#### 3.4.2 Examining Welders

The contractor shall examine each welder to determine the ability of the welder to meet the qualifications required. Test welders for piping for all positions, including welds with the axis horizontal (not rolled) and with the axis vertical. Each welder shall:

- a. Weld only in positions in which he/she has qualified.

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- b. Identify welds with the specific code marking signifying name and number assigned.

### 3.4.3 Examination Results

Provide the Contracting Officer with a list of names and corresponding code markings. Retest welders which fail to meet the prescribed welding qualifications. Disqualify welders who fail the second test, for work on the project.

### 3.4.4 Beveling

Field bevels and shop bevels shall be done by mechanical means or by flame cutting. Where beveling is done by flame cutting, surfaces shall be thoroughly cleaned of scale and oxidation just prior to welding. Conform to specified standards.

### 3.4.5 Alignment

Utilize split welding rings for field joints on all carrier pipes above two inches to assure proper alignment, complete weld penetration, and prevention of weld spatter reaching the interior of the pipe. Make field joints two inches and smaller with welding sockets.

### 3.4.6 Erection

Piping shall not be split, bent, flattened, or otherwise damaged either before, during, or after installation. Where the pipe temperature falls to 32 degrees F or lower, the pipe shall be heated to approximately 100 degrees F for a distance of one foot on each side of the weld before welding, and the weld shall be finished before the pipe cools to 32 degrees F.

### 3.4.7 Defective Welds

Replace and reinspect defective welds in accordance with ASME B31.1. Repairing defective welds by adding weld material over the defect or by peening shall not be permitted. Welders responsible for defective welds must be requalified.

### 3.4.8 Electrodes

Electrodes shall be stored in a dry heated area, and be kept free of moisture and dampness during fabrication operations. Discard electrodes that have lost part of their coating.

## 3.5 HEAT DISTRIBUTION SYSTEM INSTALLATION

The UHDS manufacturer's representative shall oversee the delivery, storage, and witness the installation and testing of the system. All work shall be in strict accordance with the requirements specified herein and with the printed instructions of the manufacturer. These specifications shall take precedence over the printed instructions, if conflicts arise. Printed instructions shall be submitted to the Contracting Officer prior to system installation.

### 3.5.1 Verification of Final Elevations

Prior to covering the top of the casing with backfill material, but after

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all temporary supports have been removed and initial backfilling of the conduit system has been accomplished, the Contractor shall measure and record the elevation of the top of the casing in the trench. Elevations shall be taken at every completed field joint, 1/3 points along each pipe section and top of elbows. This measurement shall be checked against the contract drawings. These measurements shall confirm that the conduit system has been installed to the elevations shown on the contract drawings. Slope shall be uniform to within 0.1 percent. These measurements shall be recorded by the Contractor, included in the UHDS manufacturer's representative daily report, and given to the Contracting Officer prior to covering the casing with backfill material.

### 3.5.2 Excavation, Trenching, and Backfilling

Perform all excavation, trenching, and backfilling as required by the UHDS manufacturer's design and as specified in Section 31 23 00.00 20 EXCAVATION AND FILL. Pipe shall lay on a 12 inch minimum sand bed and backfilled with sand on all sides to a minimum of 6 inches as measured from outside of casing. Foundation for system must be firm and stable. Foundation and backfill must be free from rocks or substances which could damage the system coating. Concrete anchor and thrust blocks must be installed in undisturbed earth. Backfilling must not commence until system has been satisfactorily pressure tested (both hydrostatic test of carrier and, for DDT systems, pneumatic test of casing. Minimum depth of burial to the top of the casing is 24 inches. Maximum depth of burial to the top of the casing is 10 feet.

### 3.5.3 UHDS Manufacturer's Representative Responsibilities

This shall be a person who regularly performs the duties listed below, is certified in writing by the UHDS manufacturer to be technically qualified and experienced in the installation of the system, and shall be authorized by the manufacturer to make and sign the daily reports specified herein. The UHDS Manufacturer's representative shall be present at the job site and witness when the following types of work are being performed:

- a. Inspection and unloading.
- b. Inspection of trench prior to commencing installation of system.
- c. Inspection of concrete anchors and thrust blocks.
- d. Hydrostatic testing of carrier piping.
- e. Field joint closure work.
- f. Pneumatic testing of DDT system casing.
- g. Holiday test of conduit coating.
- h. Repair of any coating.
- i. Installation of cathodic protection system.
- j. Initial backfill up to 10 inches above the top of the casing.
- k. Verification of final elevations. Elevation readings shall be witnessed and recorded.

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### 1. Testing of cathodic protection system.

#### m. Operational tests

The UHDS manufacturer's representative is to notify the contractor immediately of any problems. If necessary, the UHDS manufacturer's representative will notify the Contracting Officer of problems requiring immediate action, otherwise the daily reports will note any problems encountered and indicate the corrective actions taken.

#### 3.5.4 UHDS Manufacturer Representative's Reports

The UHDS manufacturer representative shall prepare and sign a written daily report. Present the original daily report to the Contracting Officer no later than one working day after it is prepared, and forward one copy to the manufacturer's main office. The report shall state whether or not the condition and quality of the materials used and the delivery, storage, installation and testing of the system are in accordance with the plans, specifications, and manufacturer's printed instructions and is satisfactory in all respects. When any work connected with the installation is unsatisfactory, the report shall state what corrective action has been taken or shall contain the UHDS manufacturer's recommendations for corrective action. The report shall identify any conditions that could result in an unsatisfactory installation, including such items as open conduit ends left in the trench overnight and improper manhole entries. The daily reports are to be reviewed, signed and sealed, on a weekly basis, by the registered engineer responsible for the system design. Signed and sealed copies of the daily reports shall be submitted with the payment request. Requests for payment shall be denied if the weekly review is not accomplished.

Upon completion of the work and before final acceptance, deliver to the Contracting Officer a notarized Certificate of Compliance signed by a principal officer of both the manufacturing and the contracting firm, stating that the installation is satisfactory and in accordance with plans, specifications, and manufacturer's instructions.

The UHDS manufacturer will retain a copy of all daily reports and the Certificate of Compliance for 5 years after final acceptance of the system by the government.

#### 3.5.5 Protection

Protect casing coating from damage during unloading, storage, rigging and installation. Protect casing and carrier pipe ends from water intrusion during unloading, storage, rigging and installation. Protect piping and all accessories from damage due to exposure to UV light.

#### 3.5.6 Defective Material

The UHDS Manufacturer's Representative shall take prompt action to remove from the site all damaged or defective material, subject to rejection in accordance with the quality assurance provisions included in the manufacturer's submittals and printed instructions, and shall order prompt replacement of such material.

### 3.6 TESTS

Demonstrate leak-tightness of all piping systems by performing pressure

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tests (hydrostatic, pneumatic) and operational tests. Pressure test heat distribution system in conformance with requirements stated in this specification and in printed instructions for the system supplied. Tests shall include carrier piping and casing. The carrier pipe shall be hydrostatically tested. Casings of DDT systems shall be pneumatically tested. Casing and end seals of WSL system will be tested for intrusion of water into the casing and insulation.

### 3.6.1 Holiday Testing of Direct-Buried System Steel Casings

Test entire exterior surface of the casing including the bottom exterior surface of the casing for faults in coating after installation in trench prior to backfilling. Use test method and voltage recommended by coating manufacturer. Repair any holidays found and retest. System shall not be backfilled until all holidays are eliminated.

### 3.6.2 Pneumatic, Hydrostatic and Operational Tests

Before conducting heat distribution system tests, flush lines with high pressure water until discharge shows no foreign matter and are deemed clean to the satisfaction of the Contracting Officer.

#### 3.6.2.1 Pneumatic Test

The casing of DDT systems shall be pneumatically tested after welding and before field coating using air as the test medium. The test pressure shall be 15 psig. Persons not working on the test operations shall be kept out of the testing area while testing is proceeding. The test shall be made on the system as a whole or on sections that can be isolated. Joints in sections shall be tested prior to backfilling when trenches must be backfilled before the completion of other pipeline sections. The test shall continue for 24 hours from the time of the initial readings to the final readings of pressure and temperature. The initial test readings of the instrument shall not be made for at least 1 hour after the casing has been subjected to the full test pressure, and neither the initial nor final readings shall be made at times of rapid changes in atmospheric conditions. There shall be no indication of reduction of pressure during the test after corrections have been made for changes in atmospheric conditions in conformity with the relationship  $T(1)P(2)=T(2)P(1)$ , in which T and P denote absolute temperature and pressure, respectively, and the numbers denote initial (1) and final (2) readings. Pressure shall be measured with a mercury manometer, inclined manometer (slope gauge), or an equivalent device so calibrated as to be read in increments of not greater than 0.1 psi. Pressure shall be measured with a pressure gauge conforming to ASME B40.1. A throttling type needle valve or a pulsation dampener and shutoff valve may be included. The diameter of the face shall be at least 4.5 inches with a measurable range of 0 to 15 psig and graduations of not greater than 0.1 psig. During the test, the entire system shall be completely isolated from all compressors and other sources of air pressure. Each joint shall be tested while under test pressure by means of soap and water or an equivalent nonflammable solution prior to backfilling or concealing any work. The testing instruments shall be approved by the Contracting Officer. All labor, materials and equipment for conducting the tests shall be furnished by the Contractor and shall be subject to inspection at all times during the tests. The Contractor shall maintain proper safety precautions for air pressure testing at all times during the tests.

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### 3.6.2.2 Hydrostatic Test

Carrier piping shall be tested hydrostatically before insulation is applied at field joints and shall be proved tight at a pressure 1.5 times the heat distribution supply pressure of 100 psig for 2 hours. There shall be no indication of reduction of pressure during the test. Pressure shall be measured with a device calibrated as to be read in increments of not greater than 5.0 psi.

### 3.6.2.3 Operational Test

Prior to acceptance of the installation, Contractor shall subject system to operating tests simulating actual operating conditions to demonstrate satisfactory functional and operating efficiency. These operating tests shall cover a period of not less than six hours for each portion of system tested. Conduct tests at times as the Contracting Officer may direct.

- a. The contractor shall provide calibrated instruments, equipment, facilities and labor, at no additional cost to the Government.
- b. When failures occur, repair problems then repeat test.

### 3.6.3 Deficiencies

Deficiencies discovered shall be corrected at the Contractor's expense, to the satisfaction of the Contracting Officer. Major deficiencies or failure to correct deficiencies, to the satisfaction of the Contracting Officer, may be considered cause for rejecting the entire installation.

## 3.7 VALVE MANHOLES

Valve manholes, piping, and equipment in valve manholes shall be in accordance with the contract drawings and Section 33 60 01 VALVE MANHOLES PIPING AND EQUIPMENT IN VALVE MANHOLES.

## 3.8 BURIED UTILITY WARNING AND IDENTIFICATION

### 3.8.1 Plastic Marking Tape

Polyethylene plastic tape manufactured specifically for warning and identifying buried utility lines shall be supplied and installed. Tape shall be buried above the pipe during the trench backfilling operation and shall be buried approximately 12 inches below grade. Tape shall be 0.004 inch thick polyethylene or polyethylene with a metallic core. Tape shall be acid and alkali-resistant and shall have a minimum strength of 1750 psi lengthwise and 1500 psi crosswise with an elongation factor of 350 percent. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. The tape shall be of a type specifically manufactured for marking and locating metallic underground utilities. Tape shall be 6 inches wide and printed with a caution and identification of the piping system over the entire tape length. Tape shall be yellow with bold black letters. Tape color and lettering shall be unaffected by moisture and other substances contained in the backfill material.

-- End of Section --